Notes:

The 3RV1, 3RU1 and 3RB2 devices (sizes S00/S0 to S12) can be found

- in the Catalog Add-On IC 10 AO · 2015 at the Information and Download Center
- in the interactive catalog CA 01
- in the Industry Mall

Conversion tool, e.g. from

- 3RV1 to 3RV2
- 3RU11 to 3RU21
- 3RB20/3RB21 to 3RB30/3RB31

NEW

Click on the Article No. in the catalog PDF to access it in the Industry Mall and get all related information.

Article-No.
3RA1943-2C
3RA1943-2B
3RA1953-2B
3RA1953-2N

7

Overview

Type		3RV20	3RV21	3RV23	3RV24	3RV27	3RV28
SIRIUS 3RV2 motor starter protectors/circuit breakers up to 80 A							
Applications							
• System protection		✓[1]	✓[1]	--	--	✓	✓
• Motor protection		✓	--	--	--	--	--
• Motor protection with overload relay function		--	✓	--	--	--	--
• Starter combinations		--	--	✓	--	--	--
• Transformer protection		--	--	--	✓	✓	✓
Size		S00, S0, S2	S00, S0, S2	S00, S0, S2	S00, S0, S2	S00, S0	S00, S0
Rated current I_n							
• Size S00	A	Up to 16	Up to 16	Up to 16	Up to 16	Up to 15	Up to 15
• Size S0	A	Up to 40	Up to 32	Up to 40	Up to 25	Up to 22	Up to 22
• Size S2	A	Up to 80	Up to 80	Up to 80	Up to 65	--	--
Rated operational voltage U_e according to IEC	V	690 AC[2]	690 AC[2]	690 AC[2]	690 AC[2]	690 AC	690 AC
Rated frequency	Hz	50/60	50/60	50/60	50/60	50/60	50/60
Trip class		CLASS 10 (S00 ... S2), CLASS 20 (S2)	CLASS 10	--	CLASS 10	--	--
Thermal overload releases	A A	0.11 ... 0.16 up to 70 ... 80	0.11 ... 0.16 up to 70 ... 80	None[3]	0.11 ... 0.16 up to 54 ... 65	0.16 ... 22 Non-adjustable	0.16 ... 22 Non-adjustable
Electronic release A multiple of the rated current		13 times	13 times	13 times	20 times	13 times	20 times
Short-circuit breaking capacity I_{cu} at 400 V AC	kA	20/55/65/100	55/65/100	20/55/65/100	55/65/100	[4]	[4]
Pages		7/21 ... 7/23	7/25	7/26, 7/27	7/28	7/29	7/30

Accessories																
For sizes	S00	S0	S2	S00	S0	S2	S00	S0	S2	S00	S0	S2	S00	S0	S00	S0
Auxiliary switches	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Signaling switches	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	--	--	--	--
Undervoltage releases	✓	✓	✓	--	--	--	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Shunt releases	✓	✓	✓	--	--	--	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Isolator modules	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	--	--	--	--
Insulated three-phase busbar system	✓	✓	✓	--	--	--	✓	✓	✓	✓	✓	✓	--	--	--	--
Busbar adapters	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	--	--	--	--
Door-coupling rotary operating mechanisms	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Link modules	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	--	--	--	--
Enclosures for surface mounting	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	--	--	--	--
Enclosures for flush mounting	✓	✓	--	✓	✓	--	✓	✓	--	✓	✓	--	--	--	--	--
Front plates	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	--	--	--	--
Infeed system	✓	✓	--	--	--	--	✓	✓	--	✓	✓	--	--	--	--	--
Terminal covers for ring terminal lug connections	✓[5]	✓[5]	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sealable scale covers for setting knobs	✓	✓	✓	✓	✓	✓	--	--	--	✓	✓	✓	--	--	--	--
Pages	7/31 ... 7/50															

✓ Has this function or can use this accessory

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

1) For symmetrical loading of the three phases.

2) With molded-plastic enclosure 500 V AC. For DC applications, see "Technical Specifications" → "DC Short-Circuit Breaking Capacity", page 7/16.

3) For overload protection of the motors, appropriate overload relays must be used.

4) According to UL 489 at 480 Y/277 V AC: 65 kA or 50 kA.

5) Terminal covers are available for 3RV20 motor starter protectors with ring terminal lug connection to ensure finger-safety.






Type		3RV10	3RV11	3RV13	3RV16	3RV16	3RV17
SIRIUS 3RV1 motor starter protectors/circuit breakers up to 100 A							
Applications							
• System protection		✓[1]	✓[1]	--	--	--	✓
• Motor protection		✓	--	--	--	--	--
• Motor protection with overload relay function		--	✓	--	--	--	--
• Starter combinations		--	--	✓	--	--	--
• Transformer protection		--	--	--	--	--	✓
• Fuse monitoring		--	--	--	✓	--	--
• Voltage transformer circuit breakers for distance protection		--	--	--	--	✓	--
Size		S3	S3	S3	S00	S00	S3
Rated current I_n							
• Size S00	A	--	--	--	0.2	Up to 3	--
• Size S3	A	Up to 100	Up to 100	Up to 100		--	Up to 70
Rated operational voltage U_e according to IEC	V	690 AC[2]	690 AC[2]	690 AC[2]	690 AC[2]	400 AC	690 AC
Rated frequency	Hz	50/60	50/60	50/60	50/60	$16^2/_3$ ... 60	50/60
Trip class		CLASS 10, 20	CLASS 10	--	--	--	--
Thermal overload releases	A A	11 ... 16 up to 80 ... 100	11 ... 16 up to 80 ... 100	Without[3]	0.2	1.4 ... 3	10 ... 70 non-adjustable
Electronic release A multiple of the rated current		13 times	13 times	13 times	6 times	4 ... 7 times	13 times
Short-circuit breaking capacity I_{cu} at 400 V AC	kA	50/100	50/100	50/100	100	50	[4]
Pages		7/63	7/64	7/65	7/66	7/68	7/67
Accessories							
For sizes		S3	S3	S3	S00	S00	S3
Auxiliary switches		✓	✓	✓	✓	✓	✓[5]
Signaling switches		✓	✓	✓	--	--	--
Undervoltage releases		✓	--	✓	--	--	✓
Shunt releases		✓	--	✓	--	--	✓
Busbar adapters		✓	✓	✓	--	--	--
Door-coupling rotary operating mechanisms		✓	✓	✓	--	--	✓
Remote motorized operating mechanisms		✓	✓	✓	--	--	--
Link modules		✓	✓	✓	--	--	--
Front plates		✓	✓	✓	--	--	--
Pages		7/69 ... 7/77					

✓ Has this function or can use this accessory

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

1) For symmetrical loading of the three phases.

2) With molded-plastic enclosure 500 V AC. For DC applications, see "Technical Specifications" → "DC Short-Circuit Breaking Capacity", page 7/58.

3) For overload protection of the motors, appropriate overload relays must be used.

4) Acc. to UL 489
- At 480 Y/277 V AC: 65 kA
- At 480 V AC: 65 kA (10 A to 30 A)

5) Only lateral auxiliary switches can be fitted.

Introduction

Type		3RV10			3RV13					
SIRIUS 3RV1 molded case motor starter protectors up to 800 A										
Applications										
• Motor protection		✓			--					
• Starter combinations		--			✓					
Switching capacity		Standard switching capacity			Standard switching capacity				Increased switching capacity	
Size		3RV1063	3RV1073	3RV1083	3RV1353	3RV1363	3RV1373	3RV1383	3RV1364	3RV1374
Rated current I_n	A	100 ... 200	400	630	1 ... 32	100 ... 250	400, 630	630, 800	100 ... 250	400
Rated operational voltage U_e according to IEC	V	690 AC			690 AC					
Rated frequency	Hz	50/60			50/60					
Trip class		CLASS 10A, 10, 20, 30			--[1]					
Thermal overload releases	A A	40 ... 100 up to 252 ... 630			Without[1]					
Electronic release A multiple of the rated current		Adjustable, 6 ... 13 times			Non-adjustable 1 ... 12.5 A: 13 times; Adjustable 20 A, 32 A: 6 ... 12 times	1 ... 10 times				
Short-circuit breaking capacity I_{cu} at 400 V AC	kA	120	120	100	85	120	120	100	200	200
Trip unit (release)		TU 4			TU 1: 1 ... 12.5 A; TU 2: 20 A, 32 A	TU 3				
Pages		7/83			7/84					

Accessories										
For molded case motor starter protectors		3RV1063	3RV1073	3RV1083	3RV1353	3RV1363	3RV1373	3RV1383	3RV1364	3RV1374
Auxiliary switches		✓	✓	✓	✓	✓	✓	✓	✓	✓
Undervoltage releases		✓	✓	✓	✓	✓	✓	✓	✓	✓
Shunt releases		✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotary operating mechanisms		✓	✓	✓	✓	✓	✓	✓	✓	✓
Connection methods • Extended terminals on the front		✓	✓	--	✓	✓	✓	--	✓	✓
• Cable terminals on the front		✓	✓	✓	✓	✓	✓	✓	✓	✓
• Rear terminals		✓	✓	✓	✓	✓	✓	✓	✓	✓
Pages		7/85, 7/86								

✓ Has this function or can use this accessory

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

[1] For overload protection of the motors, appropriate overload relays must be used.



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 A	0.11 ... 0.16 up to 70 ... 80	--	--
Electronic overload releases	A 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.

7

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 A	18 ... 25 up to 80 ... 100	--	--	--	
Electronic overload releases	A 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.

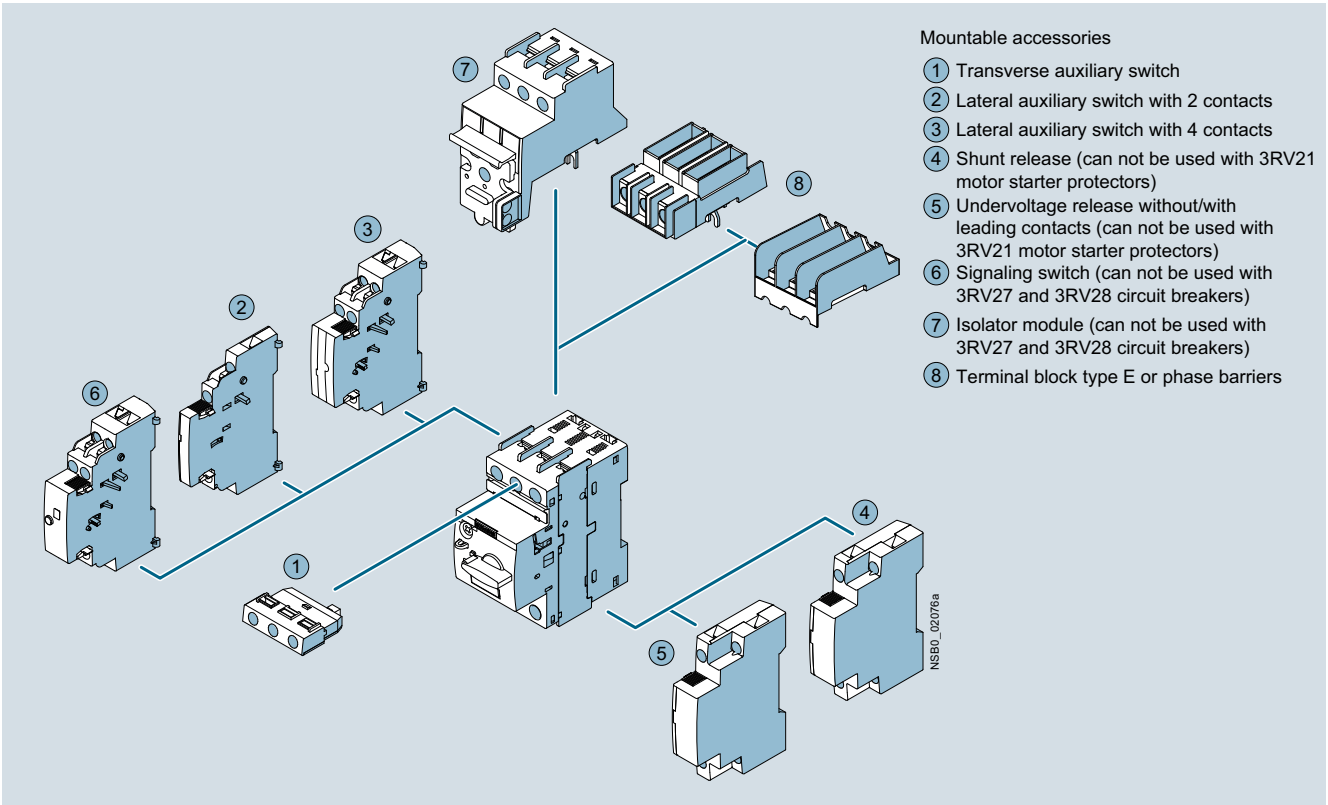
[2] With reference to the 3RB29.6 current measuring modules.

[3] Stand-alone installation without accessories is possible.

Overview

The following illustration shows our 3RV2 motor starter protector/circuit breaker with the accessories which can be mounted for the sizes S00 to S2, see also "Introduction" → "Overview", page 7/2.

Accessories, see page 7/31 onwards.



Mountable accessories for SIRIUS 3RV2 motor starter protectors/circuit breakers

SIRIUS motor starter protector with spring-type terminals, size S0 (left) and SIRIUS motor starter protector with screw terminals, size S00 (right)

The new SIRIUS 3RV2 motor starter protectors/circuit breakers are compact, current limiting motor starter protectors/circuit breakers which are optimized for load feeders. The motor starter protectors/circuit breakers are used for switching and protecting three-phase motors of up to 37 kW at 400 V AC and for other loads with rated currents of up to 80 A.

For 3RV1 motor starter protectors/circuit breakers in size S3 up to 100 A, see page 7/63 onwards.

The new 3RV2 motor starter protectors/circuit breakers are usually approved according to IEC and UL/CSA. According to UL 508/UL 60947-4-1, the 3RV2 motor starter protectors in sizes S00 to S2 are approved as:

- "Manual Motor Controllers"
- "Manual Motor Controllers" for "Group Installations"
- "Manual Motor Controllers Suitable for Tab Conductor Protection in Group Installations"
- "Self-Protected Combination Motor Controllers (Type E)" Please note that for this approval the 3RV20 motor starter protectors must be equipped with additional infeed terminals or phase barriers. More information, see "Accessories" on page 7/38.

Corresponding short-circuit values, see pages 7/10 to 7/15.

The 3RV27 and 3RV28 circuit breakers are approved as circuit breakers according to UL 489; they are a special version of the 3RV2 motor starter protectors.

General data

Type of construction

The 3RV2 motor starter protectors are available in three sizes:

- Size S00 – width 45 mm,
  max. rated current 16 A,
  at 400 V AC suitable for three-phase motors up to 7.5 kW
- Size S0 – width 45 mm,
  max. rated current 40 A,
  at 400 V AC suitable for three-phase motors up to 18.5 kW
- Size S2 – width 55 mm,
  max. rated current 80 A,
  at 400 V AC suitable for three-phase motors up to 37 kW

Size S3 of the 3RV1 motor starter protectors up to 100 A,
see page 7/63 onwards.

Circuit breakers acc. to UL 489

The 3RV27 and 3RV28 circuit breakers are available in two sizes:

- Size S00 – width 45 mm,
  max. rated current 15 A, for 480 Y/277 V AC
- For size S0 – width 45 mm,
  max. rated current 22 A, at 480 Y/277 V AC

For size S3 of the 3RV1742 circuit breakers up to 70 A,
see page 7/67.

Connection methods

The 3RV2 motor starter protectors/circuit breakers can be supplied with screw terminals, spring-type terminals and ring cable lug connections.

Screw terminals

Spring-type terminals

Ring terminal lug connections

The terminals are indicated in the corresponding tables by the symbols shown on orange backgrounds.

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

3RV20 motor starter protectors are suitable for overload protection of explosion-proof motors with "increased safety" type of protection EEx e.

EC type test certificate for Category (2) G/D has been submitted. More details on request.

7

Article No. scheme

Digit of the Article No.	1st - 3rd	4th	5th	6th	7th		8th	9th	10th	11th	12th		13th	14th	15th	16th
	□□□	□	□	□	□	–	□	□	□	□	□	–	□	□	□	□
Motor starter protectors/ circuit breakers	**3 R V**															
SIRIUS 2nd generation		**2**														
Type of motor starter protector/ circuit breaker			□													
Size				□												
Breaking capacity					□											
Setting range for overload release							□	□								
Trip class (CLASS)									□							
Connection methods										□						
With or without auxiliary switch											□					
Special versions													□	□	□	□
Example	**3 R V**	**2**	**0**	**1**	**1**	**–**	**1**	**A**	**A**	**1**	**0**					

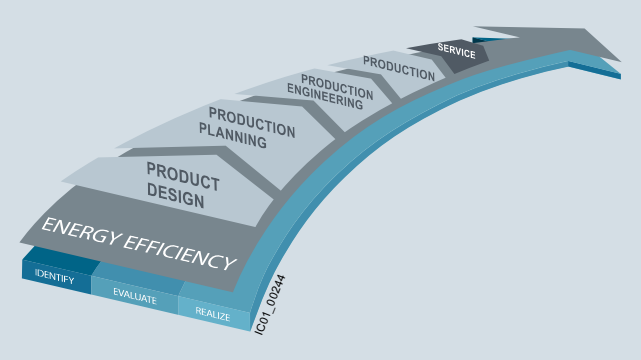
Note:

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

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

Benefits

Advantages through energy efficiency



Overview of the energy management process

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

3RV2 motor starter protectors/circuit breaker contribute to energy efficiency throughout the plant as follows:

- Minimization of energy losses through optimization of the bimetal trip units
- Reduction of inherent power loss
- Less heating of the control cabinet
- Smaller control cabinet air conditioners can be used

Application

Operating conditions

3RV2 motor starter protectors/circuit breakers are suitable for use in any climate. They are intended for use in enclosed rooms in which no severe operating conditions (such as dust, caustic vapors, hazardous gases) prevail. When installed in dusty and damp areas, suitable enclosures must be provided.

3RV2 motor starter protectors/circuit breakers can optionally be fed from the top or from below.

3RV2 motor starter protectors/circuit breakers are suitable for operation in IT systems (IT networks). In this case, the different short-circuit breaking capacity in the IT system must be taken into account, see page 7/11.

Since operational currents, starting currents and current peaks are different even for motors with identical power ratings due to the inrush current, the motor ratings in the selection tables are only guide values. The specific rated and startup data of the motor to be protected is always paramount to the choice of the most suitable motor starter protector/circuit breaker. This also applies to motor starter protectors for transformer protection.

Possible uses

The 3RV2 motor starter protectors can be used:

- For short-circuit protection
- For motor protection (also with overload relay function)
- For system protection
- For short-circuit protection for starter combinations
- For transformer protection
- As main and EMERGENCY-STOP switches
- For operation in IT systems (IT networks)
- For switching of DC currents
- In areas subject to explosion hazard (ATEX)
- Approved as circuit breakers according to UL 489 (3RV27 and 3RV28)

More information, see 1/3.

Technical specifications

Short-circuit breaking capacity I_{cu}, I_{cs} according to IEC 60947-2

This table shows the rated ultimate short-circuit breaking capacity I_{cu} and the rated service short-circuit breaking capacity I_{cs} of the 3RV2 motor starter protectors/circuit breakers with different operating voltages dependent on the rated current I_n of the motor starter protectors/circuit breakers.

Power can be supplied to the motor starter protectors/circuit breakers via the terminals at the top or at the bottom without restricting the rated data. If the short-circuit current at the place of installation exceeds the rated short-circuit breaking capacity of the motor starter protector/circuit breaker as specified in the table, a back-up fuse is required. It is also possible to install an upstream motor starter protector/circuit breaker with a limiter function.

The maximum rated current of this back-up fuse is indicated in the tables. The rated ultimate short-circuit breaking capacity then applies as specified on the fuse.

Fuseless design

Motor starter protector/contactor assemblies for short-circuit currents up to 150 kA can be ordered as fuseless load feeders, see Chapter 8 "Load Feeders and Motor Starters for Use in the Control Cabinet".

Motor starter protectors/ circuit breakers	Rated current I_n	Up to 240 V AC[1]			Up to 400 V AC[1]/ 415 V AC[2]			Up to 440 V AC[1]/ 460 V AC[2]			Up to 500 V AC[1]/ 525 V AC[2]			Up to 690 V AC[1]		
		I_{cu}	I_{cs}	Max. fuse (gG)	I_{cu}	I_{cs}	Max. fuse (gG)[3]	I_{cu}	I_{cs}	Max. fuse (gG)[3]	I_{cu}	I_{cs}	Max. fuse (gG)[3]	I_{cu}	I_{cs}	Max. fuse (gG)[3][4]
Type	A	kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A
Size S00																
3RV2.11	0.16 ... 1.6	100	100	°	100	100	°	100	100	°	100	100	°	100	100	°
	2; 2.5	100	100	°	100	100	°	100	100	°	100	100	°	10	10	25
	3.2	100	100	°	100	100	°	100	100	°	100	100	°	10	10	32
	4; 5	100	100	°	100	100	°	100	100	°	100	100	°	6	4	32
	6.3	100	100	°	100	100	°	100	100	°	100	100	°	6	4	50
	8	100	100	°	100	100	°	50	50	63	42	42	63	6	4	50
	10	100	100	°	100	100	°	50	50	80	42	42	63	6	4	50
	12.5	100	100	°	100	100	°	50	50	80	42	42	80	6	4	63
	16	100	100	°	55	30	100	50	10	80	10	5	80	4	4	63
Size S0																
3RV2.21	0.16 ... 1.6	100	100	°	100	100	°	100	100	°	100	100	°	100	100	°
	2; 2.5	100	100	°	100	100	°	100	100	°	100	100	°	10	10	25
	3.2	100	100	°	100	100	°	100	100	°	100	100	°	10	10	32
	4; 5	100	100	°	100	100	°	100	100	°	100	100	°	6	4	32
	6.3	100	100	°	100	100	°	100	100	°	100	100	°	6	4	50
	8	100	100	°	100	100	°	50	50	63	42	42	63	6	4	50
	10	100	100	°	100	100	°	50	50	80	42	42	63	6	4	50
	12.5	100	100	°	100	100	°	50	50	80	42	42	80	6	4	63
	16	100	100	°	55	25	100	50	10	80	10	5	80	4	2	63
	20	100	100	°	55	25	125	50	10	80	10	5	80	4	2	63
	22; 25	100	100	°	55	25	125	50	10	100	10	5	80	4	2	63
	28; 32	100	100	°	55	25	125	30	10	125	10	5	100	4	2	100
	36; 40	100	100	°	20	10	125	12	8	125	6	3	100	3	2	100
Size S2																
3RV2.31	14; 17	100	100	°	65	30	100	50	25	100	12	6	63	5	3	63
	20	100	100	°	65	30	100	50	25	100	12	6	80	5	3	80
	25	100	100	°	65	30	100	50	15	100	12	6	80	5	3	80
	32; 36	100	100	°	65	30	125	50	15	125	10	5	100	4	2	100
	40; 45	100	100	°	65	30	160	50	15	125	10	5	100	4	2	100
	52	100	100	°	65	30	160	50	15	125	10	5	125	4	2	125
	59 ... 80	Values on request														
Size S2, with increased switching capacity																
3RV2.32	14; 17	100	100	°	100	50	°	65	30	100	18	10	63	8	5	63
	20; 25	100	100	°	100	50	°	65	30	100	18	10	80	8	5	80
	32 ... 45	100	100	°	100	50	°	65	30	125	15	8	100	6	4	100
	52	100	100	°	100	50	°	65	30	125	15	8	125	6	4	125
	59 ... 80	Values on request														

° No back-up fuse required, since short-circuit resistant up to 100 kA

1) 10 % overvoltage.

2) 5 % overvoltage.

3) Back-up fuse only required if short-circuit current at the place of installation > I_{cu}.

4) Alternatively, fuseless limiter combinations for 690 V AC can also be used.

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Short-circuit breaking capacity I_{cuIT} in the IT system (IT network) according to IEC 60947-2

3RV2 motor starter protectors/circuit breakers are suitable for use in IT systems. The values of I_{cu} and I_{cs} apply for the three-pole short circuit. In case of a double ground fault in different phases at the input and output side of a motor starter protector, the special short-circuit breaking capacity I_{cuIT} applies. The specifications in the table below apply to 3RV2 motor starter protectors/circuit breakers.

If the short-circuit current at the place of installation exceeds the motor starter protector/circuit breaker's specified rated short-circuit breaking capacity, you will need to use a back-up fuse. The maximum rated current of this back-up fuse is indicated in the tables. The rated short-circuit breaking capacity then applies as specified on the fuse.

Motor starter protectors	Rated current I_n	Up to 240 V AC[1]		Up to 400 V AC[1]/415 V AC[2]		Up to 500 V AC[1]/525 V AC[2]		Up to 690 V AC[1][5]	
		I_{cuIT}	Max. fuse (gG)[3]	I_{cuIT}	Max. fuse (gG)[3][4]	I_{cuIT}	Max. fuse (gG)[3]	I_{cuIT}	Max. fuse (gG)[3]
Type	A	kA	A	kA	A	kA	A	kA	A
Size S00									
3RV2.11	0.16 ... 0.4	100	°	100	°	100	°	100	°
	0.5	100	°	100	°	100	°	0.5	4
	0.63; 0.8	100	°	100	°	100	°	0.5	6
	1	100	°	100	°	8	10	2	10
	1.25	100	°	100	°	8	16	2	16
	1.6	100	°	100	°	8	20	2	16
	2; 2.5	100	°	8	25	8	25	2	20
	3.2	100	°	8	32	8	32	2	25
	4; 5	100	°	4	32	2	32	2	25
	6.3; 8	100	°	4	50	2	40	1.5	35
	10	100	°	4	50	2	40	1.5	40
	12.5	100	°	4	63	2	50	1.5	40
	16	55	80	4	63	2	50	1.5	40
Size S0									
3RV2.21	0.16 ... 0.4	100	°	100	°	100	°	100	°
	0.5	100	°	100	°	100	°	0.5	4
	0.63; 0.8	100	°	100	°	100	°	0.5	6
	1	100	°	100	°	8	10	2	10
	1.25	100	°	100	°	8	16	2	16
	1.6	100	°	100	°	8	20	2	16
	2; 2.5	100	°	8	25	8	25	2	20
	3.2	100	°	8	32	8	32	2	25
	4; 5	100	°	4	32	2	32	2	25
	6.3; 8	100	°	4	50	2	40	1.5	35
	10	100	°	4	50	2	40	1.5	40
	12.5	100	°	4	63	2	50	1.5	40
	16	55	80	4	63	2	50	1.5	40
	20 ... 25	55	80	4	63	2	50	1.5	50
	28; 32	55	80	2	63	2	63	1.5	63
	36; 40	20	80	2	63	2	63	1.5	63
Size S2									
3RV2.31	14 ... 25	100	°	8	100	6	80	4	63
	32 ... 45	100	°	6	125	4	100	3	80
	52	100	°	4	160	3	125	2	100
	59 ... 80	Values on request							
Size S2, with increased switching capacity									
3RV2.32	14 ... 25	100	°	8	100	6	80	4	63
	32 ... 45	100	°	6	125	6	100	4	80
	52	100	°	6	160	6	125	4	100
	59 ... 80	Values on request							

° No back-up fuse required, since short-circuit resistant up to 100 kA

1) 10 % overvoltage.

2) 5 % overvoltage.

3) Back-up fuse only required if short-circuit current at the place of installation > I_{cuIT}.

4) Alternatively, fuseless limiter combinations for 690 V AC can also be used.

5) Overvoltage category II applies for applications in IT systems > 600 V.

General data

Limiter function with standard devices for 500 V AC and 690 V AC according to IEC 60947-2

The table shows the rated ultimate short-circuit breaking capacity I_{cu} and the rated service short-circuit breaking capacity I_{cs} with an upstream standard motor starter protector/circuit breaker that fulfills the limiter function at voltages 500 V AC and 690 V AC.

The short-circuit breaking capacity can be increased significantly with an upstream standard motor starter protector/ circuit breaker with limiter function. The motor starter protector/ circuit breaker which is connected downstream must be set to the rated current of the load.

With motor starter protector/circuit breaker assemblies, note the clearance to grounded parts and between the motor starter protectors/circuit breaker. Short-circuit proof wiring between the motor starter protectors/circuit breaker must be ensured. The motor starter protectors/circuit breakers can be mounted side by side in a modular arrangement.

Standard motor starter protectors/circuit breakers		**Rated current I_n**	**Up to 500 V AC[1]/525 V AC[2]**		**Up to 690 V AC[1]**	
	With limiter rated current I_n		I_{cu}	I_{cs}	I_{cu}	I_{cs}
Type	Type	A	kA	kA	kA	kA
Size S00						
3RV2011	**Size S0:** I_n = 32 A	2 ... 6.3	--	--	50	25
		8	100	50	20	10
		10 ... 16	100	50	20[3]	10[3]
	Size S2: 3RV1331-4HC10 I_n = 50 A	10 ... 16	--	--	50	25
Size S0						
3RV2021	**Size S0:** I_n = 32 A	16 ... 32	100	50	20[3]	10[3]
	Size S2: 3RV1331-4HC10 I_n = 50 A	16 ... 32	--	--	50	20
Size S2						
3RV2031		14 ... 80	Values on request			
Size S2, with increased switching capacity						
3RV2032		14... 80	Values on request			

-- No limiter required

1) 10 % overvoltage.

2) 5 % overvoltage.

3) Infeed to the limiter is always on the side 1L1/3L2/5L3.

Permissible rated data of approved devices for North America (UL/CSA)

Motor starter protectors of the 3RV2 series are approved for UL/CSA, and according to UL508/UL 60947-4-1 and CSA C22.2 No. 14/CSA C22.2 No. 60947-4-1 they can be used on their own or as load feeders in combination with a contactor.

These motor starter protectors/circuit breakers can be used as "Manual Motor Controllers" for "Group Installations", as "Manual Motor Controllers Suitable for Tap Conductor Protection in Group Installations" and as "Self-Protected Combination Motor Controllers" (Type E).

3RV2 motor starter protectors as "Manual Motor Controllers"

If used as a "Manual Motor Controller", the motor starter protector is always operated in combination with an upstream short-circuit protection device. Approved fuses or a circuit breaker according to UL 489/CSA C22.2 No. 5 can be used. These devices must be dimensioned according to the National Electrical Code (UL) or Canadian Electrical Code (CSA).

The file numbers for the approval of the 3RV2 as a Manual Motor Controller are as follows:

- UL File No. 47705, CCN: NLRV
- CSA Master Contract 165071, Product Class: 3211 05

Motor starter protectors		**hp rating[1] for FLA[2] max.**		**Rated current I_n**	**240 V AC**		**480 V AC**		**600 V AC**	
					UL I_{bc}[3]	CSA I_{bc}[3]	UL I_{bc}[3]	CSA I_{bc}[3]	UL I_{bc}[3]	CSA I_{bc}[3]
Type	V	Single-phase	Three-phase	A	kA	kA	kA	kA	kA	kA
Size S00										
3RV2011, 3RV2111, 3RV2311, 3RV2411				0.16 ... 12.5 16	65 65	65 65	65 65	65 65	30 --	30 --
FLA[2] max. 16 A, 480 V; 12.5 A, 600 V	115 200 230 460 575/600	1 2 2 -- --	2 3 5 10 10							
Size S0										
3RV2021, 3RV2121, 3RV2321, 3RV2421				0.16 ... 12.5 16 ... 25 28, 32 36, 40	65 65 65 65	65 65 65 65	65 65 50 12	65 65 50 12	30 --/(30)[4] -- --	30 --/(30)[4] -- --
FLA[2] max. 40 A, 480 V	115 200 230 460 575/600	3 5 7 1/2 -- --	5 10 10 30 --							
Size S2										
3RV2031, 3RV2032, 3RV2131, 3RV2331, 3RV2332, 3RV2431					Values on request					

-- No approval

1) hp rating = Power rating in horse power (maximum motor rating).

2) FLA = Full Load Amps/motor full load current.

3) Corresponds to "short-circuit breaking capacity" according to UL/CSA.

4) The values in brackets only apply to 3RV2.23 motor starter protectors.

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General data

3RV20 motor starter protectors (up to 80 A) as "Manual Motor Controller Suitable for Tap Conductor Protection in Group Installations"

The application as "Manual Motor Controllers Suitable for Tap Conductor Protection in Group Installations" is only available for UL. CSA does not recognize this approval! When the motor starter protector is used as a "Manual Motor Controller Suitable for Tap Conductor Protection in Group Installations", it must always be combined with upstream short-circuit protection. Approved fuses or a circuit breaker according to UL 489 can be used. These devices must be dimensioned according to the National Electrical Code.

The 3RV20 motor starter protectors are approved as "Manual Motor Controllers Suitable for Tap Conductor Protection in Group Installations" under the following file number:

- UL File No. 47705, CCN: NLRV

Motor starter protectors		**hp rating[1] for FLA[2] max.**		**Rated current I_n**	**240 V AC** UL I_{bc}[3]	**Up to 480 Y/277 V AC** UL I_{bc}[3]	**Up to 600 Y/347 V AC** UL I_{bc}[3]
Type	V	Single-phase	Three-phase	A	kA	kA	kA
Size S00							
3RV2011				0.16 ... 12.5 16	65 65	65 65	30 --
FLA[2] max. 16 A, 480 V; 12.5 A, 600 V	115 200 230 460 575/600	1 2 2 -- --	2 3 5 10 10				
Size S0							
3RV2021				0.16 ... 12.5 16 ... 25 28; 32	65 65 50	65 65 50	30 -- --
FLA[2] max. 32 A, 480 V	115 200 230 460 575/600	2 3 5 -- --	5 7 1/2 10 20 --				
Size S2							
3RV2031, 3RV2032					Values on request		

-- No approval

[1] hp rating = Power rating in horse power (maximum motor rating).

[2] FLA = Full Load Amps/motor full load current.

[3] Corresponds to "short-circuit breaking capacity" according to UL.

3RV20 motor starter protectors (up to 80 A) as "Self-Protected Combination Motor Controller (Type E)"

UL 508/UL 60947-4-1 approval demands 1-inch clearance and 2-inch creepage distance at line side for "Self-Protected Combination Motor Controller Type E".

Therefore, 3RV20 motor starter protectors of sizes S00 to S2 are approved according to UL 508/UL 60947-4-1 in combination with the terminal blocks listed below.

CSA does not require these extended clearances and creepage distances. According to CSA, these terminal blocks can be omitted when the device is used as a "Self-Protected Combination Motor Controller".

The 3RV20 motor starter protectors are approved as "Self-Protected Combination Motor Controllers" under the following file numbers:

- UL File No. E156943, CCN: NKJH
- CSA Master Contract 165071, Product Class: 3211 08

Motor starter protectors		**hp rating[1] for FLA[2] max.**		**Rated current I_n**	**Up to 240 V AC**		**Up to 480 Y/277 V AC**		**Up to 600 Y/347 V AC**	
					UL I_{bc}[3]	CSA I_{bc}[3]	UL I_{bc}[3]	CSA I_{bc}[3]	UL I_{bc}[3]	CSA I_{bc}[3]
Type	V	Single-phase	Three-phase	A	kA	kA	kA	kA	kA	kA
Size S00										
3RV2011 + 3RV2928-1H[4][5]				0.16 ... 12.5	65	65	65	65	30	30
				16	65	65	65	65	--	--
FLA[2] max.	115	1	2							
16 A, 480 V;	200	2	3							
12.5 A, 600 V	230	2	5							
	460	--	10							
	575/600	--	10							
Size S0										
3RV2021 + 3RV2928-1H[4][5]				0.16 ... 12.5	65	65	65	65	30	30
				16 ... 25	65	65	65	65	--	--
FLA[2] max.	115	2	5	28; 32	50	50	50	50	--	--
32 A, 480 V	200	3	7 1/2							
	230	5	10							
	460	--	20							
	575/600	--	--							
Size S2										
3RV2031/3RV2032 + 3RV2938-1K[4]					Values on request					

-- No approval

1) hp rating = Power rating in horse power (maximum motor rating).

2) FLA = Full Load Amps/motor full load current.

3) Corresponds to "short-circuit breaking capacity" according to UL/CSA.

4) Not required for CSA.

5) Alternatively, the 3RV2928-1K phase barrier can also be used.

3RV27 and 3RV28 motor starter protectors as "circuit breakers"

These motor starter protectors are approved as circuit breakers according to UL 489 and CSA 22.2 No. 5. They can be used therefore as upstream short-circuit protective devices for "Manual Motor Controllers" and "Manual Motor Controllers Suitable for Tap Conductor Protection in Group Installations".

3RV27 and 3RV28 motor starter protectors are approved as "circuit breakers" under the following file numbers:

- UL File No. E235044, CCN: DIVQ
- CSA Master Contract 165071, Product Class: 1432 01

Circuit breakers	**Rated current I_n**	**240 V AC**		**480 Y/277 V AC**		**600 Y/347 V AC**	
		UL I_{bc}[1]	CSA I_{bc}[1]	UL I_{bc}[1]	CSA I_{bc}[1]	UL I_{bc}[1]	CSA I_{bc}[1]
Type	A	kA	kA	kA	kA	kA	kA
Size S00							
3RV2711	0.16 ... 12.5	65	65	65	65	10	10
	15	65	65	65	65	--	--
3RV2811	0.16 ... 12.5	65	65	65	65	10	10
	15	65	65	65	65	--	--
Size S0							
3RV2721	20; 22	50	50	50	50	--	--
3RV2821	20; 22	50	50	50	50	--	--

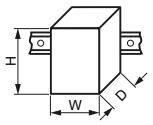
-- No approval

1) Corresponds to "short-circuit breaking capacity" according to UL.

7

General data

General data

Type			**3RV2.1.**	**3RV2.2.**	**3RV2.3.**	**3RV27, 3RV28**
Size			S00	S0	S2	S00, S0
Dimensions (W x H x D)						
• Screw terminals		mm	45 x 97 x 91	45 x 97 x 91	55 x 140 x 149	45 x 144 x 92
• Spring-type terminals		mm	45 x 106 x 91	45 x 119 x 91	--	--
Standards						
• IEC 60947-1, EN 60947-1 (VDE 0660 Part 100)			Yes			
• IEC 60947-2, EN 60947-2 (VDE 0660 Part 101)			Yes			
• IEC 60947-4-1, EN 60947-4-1 (VDE 0660 Part 102)			Yes	Yes	Yes	--
• UL 508/UL 60947-4-1, CSA C22.2 No. 14/CSA C22.2 No. 60947-4-1			Yes	Yes	Yes	--
• UL 489, CSA C22.2 No. 5			--	--	--	Yes
Number of poles			3			
Max. rated current $I_{n\ max}$ (= max. rated operational current I_e)		A	16	40	80	22
Permissible ambient temperature						
• Storage/transport		°C	–50 ... +80			
• Operation	I_n: 0.16 ... 32 A	°C	–20 ... +70 (current reduction above +60 °C)		--	
	I_n: 36 ... 40 A	°C	--	–20 ... +40 (the devices must not be mounted side-by-side and they must not be assembled with link modules with contactors. A lateral clearance of 9 mm is required.)	--	
	I_n: 14 ... 80 A	°C	--		–20 ... +70 (current reduction above +60 °C)	--
Permissible rated current at inside temperature of control cabinet						
• +60 °C		%	100			
• +70 °C		%	87			
Permissible rated current at ambient temperature of enclosure (applies for motor starter protector/circuit breaker inside enclosure ≤ 32 A)						
• +35 °C		%	100		On	100
• +60 °C		%	87		request	87
Rated operational voltage U_e						
• Acc. to IEC		V AC	690 (when a molded-plastic enclosure is used only 500 V)			
• Acc. to UL/CSA		V AC	600			
Rated frequency		Hz	50/60			
Rated insulation voltage U_i		V	690			
Rated impulse withstand voltage U_{imp}		kV	6			
Utilization category						
• IEC 60947-2 (motor starter protector/circuit breaker)			A			
• IEC 60947-4-1 (motor starter)			AC-3			
Trip class CLASS	Acc. to IEC 60947-4-1		10		10/20	--
DC short-circuit breaking capacity (time constant t = 5 ms)						
• 1 conducting path 150 V DC		kA	10		On	10
• 2 conducting paths in series 300 V DC		kA	10		request	10
• 3 conducting paths in series 450 V DC		kA	10			10
Power loss P_v for each motor starter protector/circuit breaker Dependent on the rated current I_n (upper setting range) $R_{per\ conducting\ path} = \frac{P}{I^2 \times 3}$	I_n: 0.16 ... 0.63 A	W	5		--	5
	I_n: 0.8 ... 6.3 A	W	6		--	6
	I_n: 8 ... 16 A	W	7		--	7
	I_n: 16 A	W	--	7	10	7
	I_n: 17 ... 25 A	W	--	8	12	8
	I_n: 28 ... 32 A	W	--	11	14	--
	I_n: 36 ... 40 A	W	--	14	15	--
	I_n: 45 ... 52 A	W	--	--	17	--
	I_n: ... 80 A	W	--	--	On request	--
Shock resistance	Acc. to IEC 60068-2-27	*g*/ms	25/11 (square and sine pulse)			
Degree of protection	Acc. to IEC 60529		IP20			
Touch protection	Acc. to EN 50274		Finger-safe for vertical contact from the front			
Temperature compensation	Acc. to IEC 60947-4-1	°C	–20 ... +60			
Phase failure sensitivity	Acc. to IEC 60947-4-1		Yes (only for 3RV23 motor starter protectors)			No
Explosion protection – Safe operation of motors with "increased safety" type of protection			Yes (only for 3RV20 motor starter protectors)			
EC type test certificate number according to directive 94/9/EC (ATEX)			DMT 02 ATEX F 001 Ex II (2) GD		On request	No

General data (continued)

Type			3RV2.1.	3RV2.2.	3RV2.3.	3RV27, 3RV28
Size			S00	S0	S2	S00, S0
Dimensions (W x H x D)						
• Screw terminals		mm	45 x 97 x 91	45 x 97 x 91	55 x 140 x 149	45 x 144 x 92
• Spring-type terminals		mm	45 x 106 x 91	45 x 119 x 91	--	--
Isolating function	Acc. to IEC 60947-2		Yes			
Main and EMERGENCY-STOP switch characteristics (with corresponding accessories)	Acc. to DIN EN 60204-1		Yes			
Protective separation between main and auxiliary circuits, required for PELV applications	Acc. to IEC 60947-1					
• Up to 400 V +10 %			Yes			
• Up to 415 V +5 % (higher voltages on request)			Yes			
Permissible mounting position			Any, acc. to IEC 60447 start command "I" right-hand side or top			
Mechanical endurance		Operating cycles	100 000		52 A: 50 000, 80 A: On request	100 000
Electrical endurance		Operating cycles	100 000		52 A: 50 000, 80 A: On request	100 000
Max. switching frequency per hour (motor starts)		1/h	15			

Rated data of the auxiliary switches and signaling switches

		Lateral auxiliary switch with 1 NO + 1 NC, 2 NO, 2 NC, 2 NO + 2 NC	Signaling switches	Transverse auxiliary switch with 1 CO	Transverse auxiliary switch with 1 NO + 1 NC, 2 NO
Max. rated voltage					
• Acc. to NEMA (UL)	V AC	600			250
• Acc. to NEMA (CSA)	V AC	600			250
Uninterrupted current	A	10		5	2.5
Switching capacity		1 NO + 1 NC, 2 NO, 2 NC: A600, Q300; 2 NO + 2 NC: A300, Q300	A600, Q300	B600, R300	C300, R300

Front transverse auxiliary switches

		Switching capacity for different voltages 1 CO	1 NO + 1 NC, 2 NO
Rated operational current I_e			
• At AC-15, alternating voltage			
- 24 V	A	4	2
- 230 V	A	3	0.5
• At AC-12 = I_{th}, alternating voltage			
- 24 V	A	10	2.5
- 230 V	A	10	2.5
• At DC-13, direct voltage *L/R* 200 ms			
- 24 V	A	1	1
- 48 V	A	--	0.3
- 60 V	A	--	0.15
- 110 V	A	0.22	--
- 220 V	A	0.1	--
Minimum load capacity	V	17	
	mA	1	

Front transverse solid-state compatible auxiliary switches

			Switching capacity for different voltages 1 CO
Rated operational voltage U_e	Alternating voltage	V	125
Rated operational current I_e/AC-14	at U_e = 125 V	A	0.1
Rated operational voltage U_e	Direct voltage *L/R* 200 ms	V	60
Rated operational current I_e/DC-13	at U_e = 60 V	A	0.3
Minimum load capacity		V	5
		mA	1

General data

Lateral auxiliary switches with signaling switch

		Switching capacity for different voltages: Lateral auxiliary switch with 1 NO + 1 NC, 2 NO, 2 NC, 2 NO + 2 NC Signaling switch
Rated operational current I_e		
• At AC-15, alternating voltage		
- 24 V	A	6
- 230 V	A	4
- 400 V	A	3
- 690 V	A	1
• At AC-12 = I_{th}, alternating voltage		
- 24 V	A	10
- 230 V	A	10
- 400 V	A	10
- 690 V	A	10
• At DC-13, direct voltage *L/R* 200 ms		
- 24 V	A	2
- 110 V	A	0.5
- 220 V	A	0.25
- 440 V	A	0.1
Minimum load capacity	V	17
	mA	1

Auxiliary releases

		Undervoltage releases	Shunt releases
Power consumption			
• During pick-up			
- AC voltages	VA/W	20.2/13	20.2/13
- DC voltages	W	20	13 ... 80
• During uninterrupted duty			
- AC voltages	VA/W	7.2/2.4	--
- DC voltages	W	2.1	--
Response voltage			
• Tripping	V	0.35 ... 0.7 x U_s	0.7 ... 1.1 x U_s
• Pick-up	V	0.85 ... 1.1 x U_s	--
Opening time maximum	ms	20	

Short-circuit protection for auxiliary and control circuits

Melting fuses operational class gG	A	10
Miniature circuit breakers C characteristic	A	6 (prospective short-circuit current < 0.4 kA)

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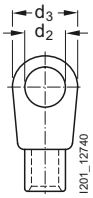
تهران، کیلومتر۲۱ بزرگراه لشگری (جاده مخصوص کرج)
روبروی پالایشگاه نفت پارس، پلاک ۱۲

Conductor cross-sections of main circuit

Type		3RV2.11	3RV2.21	3RV2.31-4B1., 3RV2.31-4D.1., 3RV2.31-4E.1., 3RV2.31-4P.1., 3RV2.31-4S.1., 3RV2.31-4T.1., 3RV2.31-4U.1., 3RV2.31-4V.1.	3RV2.31-4J.1., 3RV2.31-4K.1., 3RV2.31-4R.1., 3RV2.31-4W.1., 3RV2.31-4X.1., 3RV2431-4VA1., 3RV2.32	3RV27, 3RV28
Size		S00	S0	S2		S00, S0
Connection type		**Screw terminals**				
Terminal screw		M3, Pozidriv size 2	M4, Pozidriv size 2	M6, Pozidriv size 2		M4, Pozidriv size 2
Operating devices	mm	⌀ 5 ... 6	⌀ 5 ... 6	⌀ 5 ... 6		⌀ 5 ... 6
Prescribed tightening torque	Nm	0.8 ... 1.2	2 ... 2.5	3.0 ... 4.5		2.5 ... 3
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected						
• Solid or stranded	mm^2	2 x (0.75 ... 2.5)[1], 2 x 4	2 x (1 ... 2.5)[1], 2 x (2.5 ... 10)[1]	2 x (1 ... 25)[1], 1 x (1 ... 35)[1]	2 x (1 ... 35)[1], 1 x (1 ... 50)[1]	2 x (1 ... 10)[1], max. 1 x 25
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (0.5 ... 1.5)[1], 2 x (0.75 ... 2.5)[1]	2 x (1 ... 2.5)[1], 2 x (2.5 ... 6)[1], 1 x 10	2 x (1 ... 16)[1], 1 x (1 ... 25)[1]	2 x (1 ... 25)[1], 1 x (1 ... 35)[1]	1 x (1 ... 16), max. 6 + 16
• AWG cables, solid or stranded	AWG	2 x (20 ... 16)[1], 2 x (18 ... 12)[1]	2 x (16 ... 12)[1], 2 x (14 ... 8)[1]	2 x (18 ... 3)[1], 1 x (18 ... 2)[1]	2 x (18 ... 2)[1], 1 x (18 ... 1)[1]	2 x (14 ... 10)
Connection type		**Spring-type terminals**				
Operating devices	mm	3.0 x 0.5 and 3.5 x 0.5				
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected						
• Solid or stranded	mm^2	2 x (0.5 ... 4)	2 x (1 ... 10)	--		
• Finely stranded without end sleeve	mm^2	2 x (0.5 ... 2.5)	2 x (1 ... 6)	--		
• Finely stranded with end sleeve (DIN 46228-11)	mm^2	2 x (0.5 ... 2.5)	2 x (1 ... 6)	--		
• AWG cables, solid or stranded	AWG	2 x (20 ... 12)	2 x (18 ... 8)	--		
Max. external diameter of the conductor insulation	mm	3.6	3.6	--		
Connection type		**Ring terminal lug connections**				
Terminal screw		M3, Pozidriv size 2	M4, Pozidriv size 2	--		
Operating devices	mm	⌀ 5 ... 6	⌀ 5 ... 6	--		
Prescribed tightening torque	Nm	0.8 ... 1.2	2 ... 2.5	--		
Usable ring terminal lugs	mm	d_2 = min. 3.2, d_3 = max. 7.5	d_2 = min. 4.3, d_3 = max. 12.2	--		
• DIN 46234 without insulation sleeve						
• DIN 46225 without insulation sleeve						
• DIN 46237 with insulation sleeve						
• JIS C2805 Type R without insulation sleeve						
• JIS C2805 Type RAV with insulation sleeve						
• JIS C2805 Type RAP with insulation sleeve						

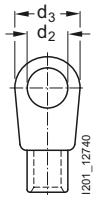


[1] If two different conductor cross-sections are connected to one clamping point, both cross-sections must be in the range specified.

General data

Conductor cross-sections for auxiliary and control circuits

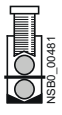
Type		3RV2.11	3RV2.21	3RV2.31, 3RV2.32	3RV27, 3RV28
Size		S00	S0	S2	S00, S0
Connection type		**Screw terminals**			
Terminal screw		M3, Pozidriv size 2			
Operating devices	mm	⌀ 5 ... 6			
Prescribed tightening torque	Nm	0.8 ... 1.2			
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected					
• Solid or stranded	mm^2	2 x (0.5 ... 1.5)[1], 2 x (0.75 ... 2.5)[1]			
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (0.5 ... 1.5)[1], 2 x (0.75 ... 2.5)[1]			
• AWG cables, solid or stranded	AWG	2 x (18 ... 14)[1], 2 x (20 ... 16)[1]			
Connection type		**Spring-type terminals**			
Operating devices	mm	3.0 x 0.5 and 3.5 x 0.5			
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected					
• Solid or stranded	mm^2	2 x (0.5 ... 2.5)			
• Finely stranded without end sleeve	mm^2	2 x (0.5 ... 2.5)			
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (0.5 ... 1.5)			
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)			
Max. external diameter of the conductor insulation	mm	3.6			
Connection type		**Ring terminal lug connections**			
Terminal screw		M3, Pozidriv size 2			
Operating devices	mm	⌀ 5 ... 6			
Tightening torque	Nm	0.8 ... 1.2			
Usable ring terminal lugs	mm	d_2 = min. 3.2, d_3 = max. 7.5			
• DIN 46234 without insulation sleeve					
• DIN 46225 without insulation sleeve					
• DIN 46237 with insulation sleeve					
• JIS C2805 Type R without insulation sleeve					
• JIS C2805 Type RAV with insulation sleeve					
• JIS C2805 Type RAP with insulation sleeve					



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

Terminals for "Self-Protected Combination Motor Controllers (Type E) according to UL 508/UL 60947-4-1"

Type		3RV2928-1H
Prescribed tightening torque	Nm	2.5 ... 3
Conductor cross-sections		
• Front clamping point connected		
- Solid	mm^2	1 ... 10
- Finely stranded with end sleeve	mm^2	1 ... 16
- Stranded	mm^2	2.5 ... 25
- AWG cables, solid or stranded	AWG	14 ... 3
- Terminal screw		M4
• Rear clamping point connected		
- Solid	mm^2	1 ... 10
- Finely stranded with end sleeve	mm^2	1 ... 16
- Stranded	mm^2	1.5 ... 25
- AWG cables, solid or stranded	AWG	14 ... 6
- Terminal screw		M4
• Both clamping points connected		
- Front clamping point:		
Solid	mm^2	1 ... 10
Finely stranded with end sleeve	mm^2	1 ... 10[1], 1 ... 6[1]
Stranded	mm^2	2.5 ... 10
AWG cables, solid or stranded	AWG	14 ... 6
Terminal screw		M4
- Rear clamping point:		
Solid	mm^2	1 ... 10
Finely stranded with end sleeve	mm^2	1 ... 10[1], 1 ... 16[1]
Stranded	mm^2	2.5 ... 10
AWG cables, solid or stranded	AWG	16 ... 3
Terminal screw		M4

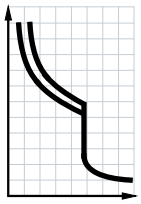


[1] The following can be connected when both clamping points are connected:
- Front 1 ... 10 mm^2 and rear 1 ... 10 mm^2
- Front 1 ... 6 mm^2 and rear 1 ... 16 mm^2

Selection and ordering data

CLASS 10, without auxiliary switches [1]

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




3RV2011-0AA10


3RV2011-0EA20


3RV2021-4AA10


3RV2021-4AA20

Rated current	Suitable for three-phase motors[2] with *P*	Setting range for thermal overload release	Instantaneous overcurrent release	Short-circuit breaking capacity at 400 V AC	DT	Screw terminals	DT	Spring-type terminals
						Article No. Price per PU		Article No. Price per PU
I_n			$I >$	I_{cu}				
A	kW	A	A	kA				
Size S00								
0.16	0.04	0.11 ... 0.16	2.1	100		**3RV2011-0AA10**		**3RV2011-0AA20**
0.2	0.06	0.14 ... 0.2	2.6	100		**3RV2011-0BA10**		**3RV2011-0BA20**
0.25	0.06	0.18 ... 0.25	3.3	100		**3RV2011-0CA10**		**3RV2011-0CA20**
0.32	0.09	0.22 ... 0.32	4.2	100		**3RV2011-0DA10**		**3RV2011-0DA20**
0.4	0.09	0.28 ... 0.4	5.2	100		**3RV2011-0EA10**		**3RV2011-0EA20**
0.5	0.12	0.35 ... 0.5	6.5	100		**3RV2011-0FA10**		**3RV2011-0FA20**
0.63	0.18	0.45 ... 0.63	8.2	100		**3RV2011-0GA10**		**3RV2011-0GA20**
0.8	0.18	0.55 ... 0.8	10	100		**3RV2011-0HA10**		**3RV2011-0HA20**
1	0.25	0.7 ... 1	13	100		**3RV2011-0JA10**		**3RV2011-0JA20**
1.25	0.37	0.9 ... 1.25	16	100		**3RV2011-0KA10**		**3RV2011-0KA20**
1.6	0.55	1.1 ... 1.6	21	100		**3RV2011-1AA10**		**3RV2011-1AA20**
2	0.75	1.4 ... 2	26	100		**3RV2011-1BA10**		**3RV2011-1BA20**
2.5	0.75	1.8 ... 2.5	33	100		**3RV2011-1CA10**		**3RV2011-1CA20**
3.2	1.1	2.2 ... 3.2	42	100		**3RV2011-1DA10**		**3RV2011-1DA20**
4	1.5	2.8 ... 4	52	100		**3RV2011-1EA10**		**3RV2011-1EA20**
5	1.5	3.5 ... 5	65	100		**3RV2011-1FA10**		**3RV2011-1FA20**
6.3	2.2	4.5 ... 6.3	82	100		**3RV2011-1GA10**		**3RV2011-1GA20**
8	3	5.5 ... 8	104	100		**3RV2011-1HA10**		**3RV2011-1HA20**
10	4	7 ... 10	130	100		**3RV2011-1JA10**		**3RV2011-1JA20**
12.5	5.5	9 ... 12.5	163	100		**3RV2011-1KA10**		**3RV2011-1KA20**
16	7.5	10[3] ... 16	208	55		**3RV2011-4AA10**		**3RV2011-4AA20**
Size S0								
0.63	0.18	0.45 ... 0.63	8.2	100	NEW B	**3RV2021-0GA10**	B	**3RV2021-0GA20**
0.8	0.18	0.55 ... 0.8	10	100	NEW B	**3RV2021-0HA10**	B	**3RV2021-0HA20**
1	0.25	0.7 ... 1	13	100	NEW B	**3RV2021-0JA10**	B	**3RV2021-0JA20**
1.25	0.37	0.9 ... 1.25	16	100	NEW B	**3RV2021-0KA10**	B	**3RV2021-0KA20**
1.6	0.55	1.1 ... 1.6	21	100	NEW B	**3RV2021-1AA10**	B	**3RV2021-1AA20**
2	0.75	1.4 ... 2	26	100	NEW B	**3RV2021-1BA10**	B	**3RV2021-1BA20**
2.5	0.75	1.8 ... 2.5	33	100	NEW B	**3RV2021-1CA10**	B	**3RV2021-1CA20**
3.2	1.1	2.2 ... 3.2	42	100	NEW B	**3RV2021-1DA10**	B	**3RV2021-1DA20**
4	1.5	2.8 ... 4	52	100	NEW B	**3RV2021-1EA10**	B	**3RV2021-1EA20**
5	1.5	3.5 ... 5	65	100	NEW B	**3RV2021-1FA10**	B	**3RV2021-1FA20**
6.3	2.2	4.5 ... 6.3	82	100	NEW B	**3RV2021-1GA10**	B	**3RV2021-1GA20**
8	3	5.5 ... 8	104	100	NEW B	**3RV2021-1HA10**	B	**3RV2021-1HA20**
10	4	7 ... 10	130	100	NEW B	**3RV2021-1JA10**	B	**3RV2021-1JA20**
12.5	5.5	9 ... 12.5	163	100	NEW B	**3RV2021-1KA10**	B	**3RV2021-1KA20**
16	7.5	10[3] ... 16	208	55		**3RV2021-4AA10**		**3RV2021-4AA20**
20	7.5	13[3] ... 20	260	55		**3RV2021-4BA10**		**3RV2021-4BA20**
22	11	16[3] ... 22	286	55		**3RV2021-4CA10**		**3RV2021-4CA20**
25	11	18[3] ... 25	325	55		**3RV2021-4DA10**		**3RV2021-4DA20**
28	15	23 ... 28	364	55		**3RV2021-4NA10**		**3RV2021-4NA20**
32[4]	15	27 ... 32	400	55		**3RV2021-4EA10**		**3RV2021-4EA20**
36[5]	18.5	30 ... 36	432	20		**3RV2021-4PA10**		--
40[5]	18.5	34 ... 40	480	20		**3RV2021-4FA10**		--

1) The 3RV20.1-..A.0 motor starter protectors up to 32 A are also available with ring terminal lug connection. The Article No. must be changed in the 11th digit to **"4"**: e.g. 3RV2011-0AA**4**0.

2) 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.

3) The setting range of the thermal overload releases has been extended.

4) Suitable for use with IE3 motors up to a starting current of 256 A. For higher starting currents we recommend using 3RV2 motor starter protectors size S2.

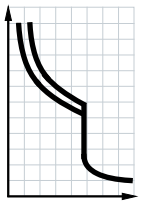
5) The devices must not be mounted side-by-side and they must not be assembled with link modules with contactors. A lateral clearance of 9 mm is required. For use with IE3 motors we recommend using 3RV2 motor starter protectors size S2.

Auxiliary switches and other accessories can be ordered separately (see "Accessories" page 7/32 onwards).

* You can order this quantity or a
Illustrations are approximate

For motor protection

CLASS 10, without auxiliary switches



3RV2031-4.A10

3RV2032-4.A10

Rated current	Suitable for three-phase motors[1] with *P*	Setting range for thermal overload release	Instantaneous overcurrent release	Short-circuit breaking capacity at 400 V AC	DT	Screw terminals		PU (UNIT, SET, M)	PS*	PG
I_n			$I >$	I_{cu}		Article No.	Price per PU			
A	kW	A	A	kA						
Size S2										
14	5.5	9.5 ... 14	208	65	NEW A	**3RV2031-4SA10**		1	1 unit	41E
17	7.5	12 ... 17	260	65	NEW A	**3RV2031-4TA10**		1	1 unit	41E
20	7.5	14 ... 20	260	65	NEW A	**3RV2031-4BA10**		1	1 unit	41E
25	11	18 ... 25	325	65	NEW A	**3RV2031-4DA10**		1	1 unit	41E
32	15	22 ... 32	416	65	NEW A	**3RV2031-4EA10**		1	1 unit	41E
36	18.5	28 ... 36	520	65	NEW A	**3RV2031-4PA10**		1	1 unit	41E
40	18.5	32 ... 40	585	65	NEW A	**3RV2031-4UA10**		1	1 unit	41E
45	22	35 ... 45	650	65	NEW A	**3RV2031-4VA10**		1	1 unit	41E
52	22	42 ... 52	741	65	NEW A	**3RV2031-4WA10**		1	1 unit	41E
59[2]	30	49 ... 59	845	65	NEW X	**3RV2031-4XA10**		1	1 unit	41E
65[2]	30	54 ... 65	845	65	NEW X	**3RV2031-4JA10**		1	1 unit	41E
73[2]	37	62 ... 73	949	65	NEW X	**3RV2031-4KA10**		1	1 unit	41E
80[2][3]	37	70 ... 80	1 040	65	NEW X	**3RV2031-4RA10**		1	1 unit	41E
Size S2, with increased switching capacity										
14	5.5	9.5 ... 14	208	100	NEW A	**3RV2032-4SA10**		1	1 unit	41E
17	7.5	12 ... 17	260	100	NEW A	**3RV2032-4TA10**		1	1 unit	41E
20	7.5	14 ... 20	260	100	NEW A	**3RV2032-4BA10**		1	1 unit	41E
25	11	18 ... 25	325	100	NEW A	**3RV2032-4DA10**		1	1 unit	41E
32	15	22 ... 32	416	100	NEW A	**3RV2032-4EA10**		1	1 unit	41E
36	18.5	28 ... 36	520	100	NEW A	**3RV2032-4PA10**		1	1 unit	41E
40	18.5	32 ... 40	585	100	NEW A	**3RV2032-4UA10**		1	1 unit	41E
45	22	35 ... 45	650	100	NEW A	**3RV2032-4VA10**		1	1 unit	41E
52	22	42 ... 52	741	100	NEW A	**3RV2032-4WA10**		1	1 unit	41E
59[2]	30	49 ... 59	845	100	NEW X	**3RV2032-4XA10**		1	1 unit	41E
65[2]	30	54 ... 65	845	100	NEW X	**3RV2032-4JA10**		1	1 unit	41E
73[2]	37	62 ... 73	949	100	NEW X	**3RV2032-4KA10**		1	1 unit	41E
80[2][3]	37	70 ... 80	1 040	100	NEW X	**3RV2032-4RA10**		1	1 unit	41E

[1] 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.

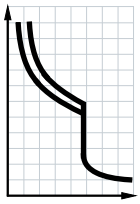
[2] Start of delivery on request.

[3] Suitable for use with IE3 motors up to a starting current of 720 A. For higher starting currents we recommend using 3RV1 motor starter protectors size S3.

Auxiliary switches and other accessories can be ordered separately (see "Accessories" page 7/32 onwards).

CLASS 10, with transverse auxiliary switch (1 NO + 1 NC)

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



3RV2011-4AA15
with integrated transverse auxiliary switch

3RV2011-0EA25
with integrated transverse auxiliary switch

3RV2021-4AA15
with integrated transverse auxiliary switch

3RV2021-4AA25
with integrated transverse auxiliary switch

Rated current	Suitable for three-phase motors[1] with *P*	Setting range for thermal overload release	Instantaneous overcurrent release	Short-circuit breaking capacity at 400 V AC	DT	**Screw terminals**	DT	**Spring-type terminals**
						Article No. / Price per PU		Article No. / Price per PU
I_n			$I >$	I_{cu}				
A	kW	A	A	kA				
Size S00								
0.16	0.04	0.11 ... 0.16	2.1	100	▶	**3RV2011-0AA15**	▶	**3RV2011-0AA25**
0.2	0.06	0.14 ... 0.2	2.6	100	▶	**3RV2011-0BA15**	▶	**3RV2011-0BA25**
0.25	0.06	0.18 ... 0.25	3.3	100	▶	**3RV2011-0CA15**	▶	**3RV2011-0CA25**
0.32	0.09	0.22 ... 0.32	4.2	100	▶	**3RV2011-0DA15**	▶	**3RV2011-0DA25**
0.4	0.09	0.28 ... 0.4	5.2	100	▶	**3RV2011-0EA15**	▶	**3RV2011-0EA25**
0.5	0.12	0.35 ... 0.5	6.5	100	▶	**3RV2011-0FA15**	▶	**3RV2011-0FA25**
0.63	0.18	0.45 ... 0.63	8.2	100	▶	**3RV2011-0GA15**	▶	**3RV2011-0GA25**
0.8	0.18	0.55 ... 0.8	10	100	▶	**3RV2011-0HA15**	▶	**3RV2011-0HA25**
1	0.25	0.7 ... 1	13	100	▶	**3RV2011-0JA15**	▶	**3RV2011-0JA25**
1.25	0.37	0.9 ... 1.25	16	100	▶	**3RV2011-0KA15**	▶	**3RV2011-0KA25**
1.6	0.55	1.1 ... 1.6	21	100	▶	**3RV2011-1AA15**	▶	**3RV2011-1AA25**
2	0.75	1.4 ... 2	26	100	▶	**3RV2011-1BA15**	▶	**3RV2011-1BA25**
2.5	0.75	1.8 ... 2.5	33	100	▶	**3RV2011-1CA15**	▶	**3RV2011-1CA25**
3.2	1.1	2.2 ... 3.2	42	100	▶	**3RV2011-1DA15**	▶	**3RV2011-1DA25**
4	1.5	2.8 ... 4	52	100	▶	**3RV2011-1EA15**	▶	**3RV2011-1EA25**
5	1.5	3.5 ... 5	65	100	▶	**3RV2011-1FA15**	▶	**3RV2011-1FA25**
6.3	2.2	4.5 ... 6.3	82	100	▶	**3RV2011-1GA15**	▶	**3RV2011-1GA25**
8	3	5.5 ... 8	104	100	▶	**3RV2011-1HA15**	▶	**3RV2011-1HA25**
10	4	7 ... 10	130	100	▶	**3RV2011-1JA15**	▶	**3RV2011-1JA25**
12.5	5.5	9 ... 12.5	163	100	▶	**3RV2011-1KA15**	▶	**3RV2011-1KA25**
16	7.5	10[2] ... 16	208	55	▶	**3RV2011-4AA15**	▶	**3RV2011-4AA25**
Size S0								
16	7.5	10[2] ... 16	208	55	▶	**3RV2021-4AA15**	▶	**3RV2021-4AA25**
20	7.5	13[2] ... 20	260	55	▶	**3RV2021-4BA15**	▶	**3RV2021-4BA25**
22	11	16[2] ... 22	286	55	▶	**3RV2021-4CA15**	▶	**3RV2021-4CA25**
25	11	18[2] ... 25	325	55	▶	**3RV2021-4DA15**	▶	**3RV2021-4DA25**
28	15	23 ... 28	364	55	▶	**3RV2021-4NA15**	▶	**3RV2021-4NA25**
32[3]	15	27 ... 32	400	55	▶	**3RV2021-4EA15**	▶	**3RV2021-4EA25**
36[4]	18.5	30 ... 36	432	20	▶	**3RV2021-4PA15**		--
40[4]	18.5	34 ... 40	480	20	▶	**3RV2021-4FA15**		--

[1] 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.

[2] The setting range of the thermal overload releases has been extended.

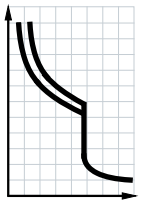
[3] Suitable for use with IE3 motors up to a starting current of 256 A. For higher starting currents we recommend using 3RV2 motor starter protectors size S2.

[4] The devices must not be mounted side-by-side and they must not be assembled with link modules with contactors. A lateral clearance of 9 mm is required. For use with IE3 motors we recommend using 3RV2 motor starter protectors size S2.

Auxiliary switches and other accessories can be ordered separately (see "Accessories" page 7/32 onwards).

For motor protection

CLASS 20, without auxiliary switches



3RV2031-4.B10

3RV2031-4WB10

Rated current	Suitable for three-phase motors[1] with *P*	Setting range for thermal overload release	Instantaneous overcurrent release	Short-circuit breaking capacity at 400 V AC	DT	Screw terminals		PU (UNIT, SET, M)	PS*	PG
I_n			$I >$	I_{cu}		Article No.	Price per PU			
A	kW	A	A	kA						
Size S2										
14	5.5	9.5 ... 14	208	65	NEW A	**3RV2031-4SB10**		1	1 unit	41E
17	7.5	12 ... 17	260	65	NEW A	**3RV2031-4TB10**		1	1 unit	41E
20	7.5	14 ... 20	260	65	NEW A	**3RV2031-4BB10**		1	1 unit	41E
25	11	18 ... 25	325	65	NEW A	**3RV2031-4DB10**		1	1 unit	41E
32	15	22 ... 32	416	65	NEW A	**3RV2031-4EB10**		1	1 unit	41E
36	18.5	28 ... 36	520	65	NEW A	**3RV2031-4PB10**		1	1 unit	41E
40	18.5	32 ... 40	585	65	NEW A	**3RV2031-4UB10**		1	1 unit	41E
45	22	35 ... 45	650	65	NEW A	**3RV2031-4VB10**		1	1 unit	41E
52	22	42 ... 52	741	65	NEW A	**3RV2031-4WB10**		1	1 unit	41E
59[2]	30	49 ... 59	845	65	NEW X	**3RV2031-4XB10**		1	1 unit	41E
65[2]	30	54 ... 65	845	65	NEW X	**3RV2031-4JB10**		1	1 unit	41E

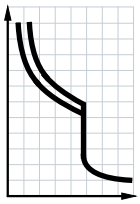
[1] Guide value for 4-pole standard motors at 50 Hz 400 V AC. The actual starting and rated data of the motor to be protected must be considered when selecting the units.

[2] Start of delivery on request.

Auxiliary switches and other accessories can be ordered separately (see "Accessories" page 7/32 onwards).

Selection and ordering data

CLASS 10, with overload relay function (automatic RESET), without auxiliary switches



3RV2111-0FA10

3RV2121-4BA10

3RV2131-4.B10

3RV2131-4WB10

Rated current	Suitable for three-phase motors[1] with *P*	Setting range for thermal overload release	Instantaneous overcurrent release	Short-circuit breaking capacity at 400 V AC	DT	Screw terminals		PU (UNIT, SET, M)	PS*	PG
I_n		⊏	$I >$	I_{cu}		Article No.	Price per PU			
A	kW	A	A	kA						
Size S00[2]										
0.16	0.04	0.11 ... 0.16	2.1	100	A	**3RV2111-0AA10**		1	1 unit	41E
0.2	0.06	0.14 ... 0.2	2.6	100	A	**3RV2111-0BA10**		1	1 unit	41E
0.25	0.06	0.18 ... 0.25	3.3	100	A	**3RV2111-0CA10**		1	1 unit	41E
0.32	0.09	0.22 ... 0.32	4.2	100	A	**3RV2111-0DA10**		1	1 unit	41E
0.4	0.09	0.28 ... 0.4	5.2	100	A	**3RV2111-0EA10**		1	1 unit	41E
0.5	0.12	0.35 ... 0.5	6.5	100	A	**3RV2111-0FA10**		1	1 unit	41E
0.63	0.18	0.45 ... 0.63	8.2	100	A	**3RV2111-0GA10**		1	1 unit	41E
0.8	0.18	0.55 ... 0.8	10	100	A	**3RV2111-0HA10**		1	1 unit	41E
1	0.25	0.7 ... 1	13	100	A	**3RV2111-0JA10**		1	1 unit	41E
1.25	0.37	0.9 ... 1.25	16	100	A	**3RV2111-0KA10**		1	1 unit	41E
1.6	0.55	1.1 ... 1.6	21	100	A	**3RV2111-1AA10**		1	1 unit	41E
2	0.75	1.4 ... 2	26	100	A	**3RV2111-1BA10**		1	1 unit	41E
2.5	0.75	1.8 ... 2.5	33	100	A	**3RV2111-1CA10**		1	1 unit	41E
3.2	1.1	2.2 ... 3.2	42	100	A	**3RV2111-1DA10**		1	1 unit	41E
4	1.5	2.8 ... 4	52	100	A	**3RV2111-1EA10**		1	1 unit	41E
5	1.5	3.5 ... 5	65	100	A	**3RV2111-1FA10**		1	1 unit	41E
6.3	2.2	4.5 ... 6.3	82	100	A	**3RV2111-1GA10**		1	1 unit	41E
8	3	5.5 ... 8	104	100	A	**3RV2111-1HA10**		1	1 unit	41E
10	4	7 ... 10	130	100	A	**3RV2111-1JA10**		1	1 unit	41E
12.5	5.5	9 ... 12.5	163	100	A	**3RV2111-1KA10**		1	1 unit	41E
16	7.5	10[3] ... 16	208	55	A	**3RV2111-4AA10**		1	1 unit	41E
Size S0[2]										
16	7.5	10[3] ... 16	208	55	A	**3RV2121-4AA10**		1	1 unit	41E
20	7.5	13[3] ... 20	260	55	A	**3RV2121-4BA10**		1	1 unit	41E
22	11	16[3] ... 22	286	55	A	**3RV2121-4CA10**		1	1 unit	41E
25	11	18[3] ... 25	325	55	A	**3RV2121-4DA10**		1	1 unit	41E
28	15	23 ... 28	364	55	A	**3RV2121-4NA10**		1	1 unit	41E
32[4]	15	27 ... 32	400	55	A	**3RV2121-4EA10**		1	1 unit	41E
Size S2[2]										
14	5.5	9.5 ... 14	208	65	NEW A	**3RV2131-4SA10**		1	1 unit	41E
17	7.5	12 ... 17	260	65	NEW A	**3RV2131-4TA10**		1	1 unit	41E
20	7.5	14 ... 20	260	65	NEW A	**3RV2131-4BA10**		1	1 unit	41E
25	11	18 ... 25	325	65	NEW A	**3RV2131-4DA10**		1	1 unit	41E
32	15	22 ... 32	416	65	NEW A	**3RV2131-4EA10**		1	1 unit	41E
36	18.5	28 ... 36	520	65	NEW A	**3RV2131-4PA10**		1	1 unit	41E
40	18.5	32 ... 40	585	65	NEW A	**3RV2131-4UA10**		1	1 unit	41E
45	22	35 ... 45	650	65	NEW A	**3RV2131-4VA10**		1	1 unit	41E
52	22	42 ... 52	741	65	NEW A	**3RV2131-4WA10**		1	1 unit	41E
59[5]	30	49 ... 59	845	65	NEW X	**3RV2131-4XA10**		1	1 unit	41E
65[5]	30	54 ... 65	845	65	NEW X	**3RV2131-4JA10**		1	1 unit	41E
73[5]	37	62 ... 73	949	65	NEW X	**3RV2131-4KA10**		1	1 unit	41E
80[5][6]	37	70 ... 80	1 040	65	NEW X	**3RV2131-4RA10**		1	1 unit	41E

1) 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.

2) Accessories for mounting on the right and 3RV2915 three-phase busbars cannot be used.

3) The setting range of the thermal overload releases has been extended.

4) Suitable for use with IE3 motors up to a starting current of 256 A. For higher starting currents we recommend using 3RV2 motor starter protectors size S2.

5) Start of delivery on request.

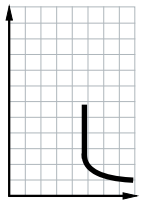
6) Suitable for use with IE3 motors up to a starting current of 720 A. For higher starting currents we recommend using 3RV1 motor starter protectors size S3.

Auxiliary switches and other accessories can be ordered separately (see "Accessories" page 7/32 onwards).

Selection and ordering data

Without auxiliary switches

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



3RV2311-4AC10

3RV2311-0JC20

3RV2321-4AC10

3RV2321-4AC20

Rated current	Suitable for three-phase motors[1] with *P*	Thermal overload release[2]	Instantaneous overcurrent release	Short-circuit breaking capacity at 400 V AC	DT	**Screw terminals**	DT	**Spring-type terminals**
I_n			$I >$	I_{cu}		Article No. / Price per PU		Article No. / Price per PU
A	kW	A	A	kA				
Size S00								
0.16	0.04	Without	2.1	100	B	**3RV2311-0AC10**	B	**3RV2311-0AC20**
0.2	0.06	Without	2.6	100	B	**3RV2311-0BC10**	B	**3RV2311-0BC20**
0.25	0.06	Without	3.3	100	B	**3RV2311-0CC10**	B	**3RV2311-0CC20**
0.32	0.09	Without	4.2	100	B	**3RV2311-0DC10**	B	**3RV2311-0DC20**
0.4	0.09	Without	5.2	100	B	**3RV2311-0EC10**	B	**3RV2311-0EC20**
0.5	0.12	Without	6.5	100	B	**3RV2311-0FC10**	B	**3RV2311-0FC20**
0.63	0.18	Without	8.2	100	B	**3RV2311-0GC10**	B	**3RV2311-0GC20**
0.8	0.18	Without	10	100	B	**3RV2311-0HC10**	B	**3RV2311-0HC20**
1	0.25	Without	13	100	B	**3RV2311-0JC10**	B	**3RV2311-0JC20**
1.25	0.37	Without	16	100	B	**3RV2311-0KC10**	B	**3RV2311-0KC20**
1.6	0.55	Without	21	100	B	**3RV2311-1AC10**	B	**3RV2311-1AC20**
2	0.75	Without	26	100	B	**3RV2311-1BC10**	B	**3RV2311-1BC20**
2.5	0.75	Without	33	100	B	**3RV2311-1CC10**	B	**3RV2311-1CC20**
3.2	1.1	Without	42	100	B	**3RV2311-1DC10**	B	**3RV2311-1DC20**
4	1.5	Without	52	100	B	**3RV2311-1EC10**	B	**3RV2311-1EC20**
5	1.5	Without	65	100	B	**3RV2311-1FC10**	B	**3RV2311-1FC20**
6.3	2.2	Without	82	100	B	**3RV2311-1GC10**	B	**3RV2311-1GC20**
8	3	Without	104	100	B	**3RV2311-1HC10**	B	**3RV2311-1HC20**
10	4	Without	130	100	B	**3RV2311-1JC10**	B	**3RV2311-1JC20**
12.5	5.5	Without	163	100	B	**3RV2311-1KC10**	B	**3RV2311-1KC20**
16	7.5	Without	208	55	B	**3RV2311-4AC10**	B	**3RV2311-4AC20**
Size S0								
1.6	0.55	Without	21	100	NEW B	**3RV2321-1AC10**	B	**3RV2321-1AC20**
2	0.75	Without	26	100	NEW B	**3RV2321-1BC10**	B	**3RV2321-1BC20**
2.5	0.75	Without	33	100	NEW B	**3RV2321-1CC10**	B	**3RV2321-1CC20**
3.2	1.1	Without	42	100	NEW B	**3RV2321-1DC10**	B	**3RV2321-1DC20**
4	1.5	Without	52	100	NEW B	**3RV2321-1EC10**	B	**3RV2321-1EC20**
5	1.5	Without	65	100	NEW B	**3RV2321-1FC10**	B	**3RV2321-1FC20**
6.3	2.2	Without	82	100	NEW B	**3RV2321-1GC10**	B	**3RV2321-1GC20**
8	3	Without	104	100	NEW B	**3RV2321-1HC10**	B	**3RV2321-1HC20**
10	4	Without	130	100	NEW B	**3RV2321-1JC10**	B	**3RV2321-1JC20**
12.5	5.5	Without	163	100	NEW B	**3RV2321-1KC10**	B	**3RV2321-1KC20**
16	7.5	Without	208	55	B	**3RV2321-4AC10**	B	**3RV2321-4AC20**
20	7.5	Without	260	55	B	**3RV2321-4BC10**	B	**3RV2321-4BC20**
22	11	Without	286	55	B	**3RV2321-4CC10**	B	**3RV2321-4CC20**
25	11	Without	325	55	B	**3RV2321-4DC10**	B	**3RV2321-4DC20**
28	15	Without	364	55	B	**3RV2321-4NC10**	B	**3RV2321-4NC20**
32[3]	15	Without	400	55	B	**3RV2321-4EC10**	B	**3RV2321-4EC20**
36[4]	18.5	Without	432	20	B	**3RV2321-4PC10**		--
40[4]	18.5	Without	480	20	B	**3RV2321-4FC10**		--

[1] 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.

[2] For overload protection of the motors, appropriate overload relays must be used.

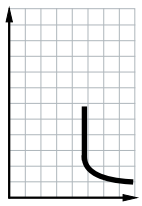
[3] Suitable for use with IE3 motors up to a starting current of 256 A. For higher starting currents we recommend using 3RV2 motor starter protectors size S2.

[4] The devices must not be mounted side-by-side and they must not be assembled with link modules with contactors. A lateral clearance of 9 mm is required. For use with IE3 motors we recommend using 3RV2 motor starter protectors size S2.

Size S2, see page 7/27.

Auxiliary switches and other accessories can be ordered separately (see "Accessories" page 7/32 onwards).

Without auxiliary switches (continued)



3RV2331-4.C10

3RV2331-4WC10

3RV2332-4.C10

3RV2332-4WC10

Rated current	Suitable for three-phase motors[1] with *P*	Thermal overload release[2]	Instantaneous overcurrent release	Short-circuit breaking capacity at 400 V AC	DT	Screw terminals		PU (UNIT, SET, M)	PS*	PG
I_n			$I >$	I_{cu}		Article No.	Price per PU			
A	kW	A	A	kA						
Size S2										
14	5.5	Without	208	65	NEW A	**3RV2331-4SC10**		1	1 unit	41E
17	7.5	Without	260	65	NEW A	**3RV2331-4TC10**		1	1 unit	41E
20	7.5	Without	260	65	NEW A	**3RV2331-4BC10**		1	1 unit	41E
25	11	Without	325	65	NEW A	**3RV2331-4DC10**		1	1 unit	41E
32	15	Without	416	65	NEW A	**3RV2331-4EC10**		1	1 unit	41E
36	18.5	Without	520	65	NEW A	**3RV2331-4PC10**		1	1 unit	41E
40	18.5	Without	585	65	NEW A	**3RV2331-4UC10**		1	1 unit	41E
45	22	Without	650	65	NEW A	**3RV2331-4VC10**		1	1 unit	41E
52	22	Without	741	65	NEW A	**3RV2331-4WC10**		1	1 unit	41E
59[3]	30	Without	845	65	NEW X	**3RV2331-4XC10**		1	1 unit	41E
65[3]	30	Without	845	65	NEW X	**3RV2331-4JC10**		1	1 unit	41E
73[3]	37	Without	949	65	NEW X	**3RV2331-4KC10**		1	1 unit	41E
80[3][4]	37	Without	1 040	65	NEW X	**3RV2331-4RC10**		1	1 unit	41E
Size S2, with increased switching capacity										
14	5.5	Without	208	100	NEW A	**3RV2332-4SC10**		1	1 unit	41E
17	7.5	Without	260	100	NEW A	**3RV2332-4TC10**		1	1 unit	41E
20	7.5	Without	260	100	NEW A	**3RV2332-4BC10**		1	1 unit	41E
25	11	Without	325	100	NEW A	**3RV2332-4DC10**		1	1 unit	41E
32	15	Without	416	100	NEW A	**3RV2332-4EC10**		1	1 unit	41E
36	18.5	Without	520	100	NEW A	**3RV2332-4PC10**		1	1 unit	41E
40	18.5	Without	585	100	NEW A	**3RV2332-4UC10**		1	1 unit	41E
45	22	Without	650	100	NEW A	**3RV2332-4VC10**		1	1 unit	41E
52	22	Without	741	100	NEW A	**3RV2332-4WC10**		1	1 unit	41E
59[3]	30	Without	845	100	NEW X	**3RV2332-4XC10**		1	1 unit	41E
65[3]	30	Without	845	100	NEW X	**3RV2332-4JC10**		1	1 unit	41E
73[3]	37	Without	949	100	NEW X	**3RV2332-4KC10**		1	1 unit	41E
80[3][4]	37	Without	1 040	100	NEW X	**3RV2332-4RC10**		1	1 unit	41E

1) 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.

2) For overload protection of the motors, appropriate overload relays must be used.

3) Start of delivery on request.

4) Suitable for use with IE3 motors up to a starting current of 720 A. For higher starting currents we recommend using 3RV1 motor starter protectors size S3.

Auxiliary switches and other accessories can be ordered separately (see "Accessories" page 7/32 onwards).

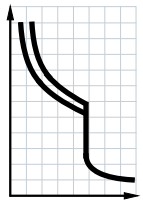
For transformer protection

Selection and ordering data

CLASS 10, without auxiliary switches

Motor starter protectors for the protection of transformers with high inrush current

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




3RV2411-0AA10


3RV2411-0AA20


3RV2421-4AA10


3RV2421-4AA20


3RV2431-4.A10


3RV2421-4WA10

Rated current	Setting range for thermal overload release	Instantaneous overcurrent release	Short-circuit breaking capacity at 400 V AC	DT	Screw terminals	DT	Spring-type terminals	
I_n		$I >$	I_{cu}		Article No.	Price per PU	Article No.	Price per PU
A	A	A	kA					
Size S00								
0.16	0.11 ... 0.16	3.3	100	▶	**3RV2411-0AA10**	A	**3RV2411-0AA20**	
0.2	0.14 ... 0.2	4.2	100	▶	**3RV2411-0BA10**	A	**3RV2411-0BA20**	
0.25	0.18 ... 0.25	5.2	100	▶	**3RV2411-0CA10**	A	**3RV2411-0CA20**	
0.32	0.22 ... 0.32	6.5	100	▶	**3RV2411-0DA10**	A	**3RV2411-0DA20**	
0.4	0.28 ... 0.4	8.2	100	▶	**3RV2411-0EA10**	A	**3RV2411-0EA20**	
0.5	0.35 ... 0.5	10	100	▶	**3RV2411-0FA10**	A	**3RV2411-0FA20**	
0.63	0.45 ... 0.63	13	100	▶	**3RV2411-0GA10**	A	**3RV2411-0GA20**	
0.8	0.55 ... 0.8	16	100	▶	**3RV2411-0HA10**	A	**3RV2411-0HA20**	
1	0.7 ... 1	21	100	▶	**3RV2411-0JA10**	A	**3RV2411-0JA20**	
1.25	0.9 ... 1.25	26	100	▶	**3RV2411-0KA10**	A	**3RV2411-0KA20**	
1.6	1.1 ... 1.6	33	100	▶	**3RV2411-1AA10**	A	**3RV2411-1AA20**	
2	1.4 ... 2	42	100	▶	**3RV2411-1BA10**	A	**3RV2411-1BA20**	
2.5	1.8 ... 2.5	52	100	▶	**3RV2411-1CA10**	A	**3RV2411-1CA20**	
3.2	2.2 ... 3.2	65	100	▶	**3RV2411-1DA10**	A	**3RV2411-1DA20**	
4	2.8 ... 4	82	100	▶	**3RV2411-1EA10**	A	**3RV2411-1EA20**	
5	3.5 ... 5	104	100	▶	**3RV2411-1FA10**	A	**3RV2411-1FA20**	
6.3	4.5 ... 6.3	130	100	▶	**3RV2411-1GA10**	A	**3RV2411-1GA20**	
8	5.5 ... 8	163	100	▶	**3RV2411-1HA10**	A	**3RV2411-1HA20**	
10	7 ... 10	208	100	▶	**3RV2411-1JA10**	A	**3RV2411-1JA20**	
12.5	9 ... 12.5	260	100	▶	**3RV2411-1KA10**	A	**3RV2411-1KA20**	
16	10[1] ... 16	286	55	▶	**3RV2411-4AA10**	A	**3RV2411-4AA20**	
Size S0								
16	10[1] ... 16	286	55	▶	**3RV2421-4AA10**	A	**3RV2421-4AA20**	
20	13[1] ... 20	325	55	▶	**3RV2421-4BA10**	A	**3RV2421-4BA20**	
22	16[1] ... 22	364	55	▶	**3RV2421-4CA10**	A	**3RV2421-4CA20**	
25	18[1] ... 25	400	55	▶	**3RV2421-4DA10**	A	**3RV2421-4DA20**	
Size S2								
14	9.5 ... 14	328	65	NEW	**3RV2431-4SA10**	A	--	
17	12 ... 17	410	65	NEW	**3RV2431-4TA10**	A	--	
20	14 ... 20	410	65	NEW	**3RV2431-4BA10**	A	--	
25	18 ... 25	512	65	NEW	**3RV2431-4DA10**	A	--	
32	22 ... 32	656	65	NEW	**3RV2431-4EA10**	A	--	
36	28 ... 36	820	65	NEW	**3RV2431-4PA10**	A	--	
40	32 ... 40	820	65	NEW	**3RV2431-4UA10**	A	--	
45	35 ... 45	922	65	NEW	**3RV2431-4VA10**	A	--	
52	42 ... 52	1 025	65	NEW	**3RV2431-4WA10**	A	--	
59[2]	49 ... 59	1 332	65	NEW	**3RV2431-4XA10**	X	--	
65[2]	54 ... 65	1 332	65	NEW	**3RV2431-4JA10**	X	--	

[1] The setting range of the thermal overload releases has been extended.

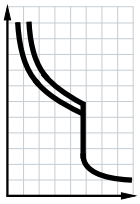
[2] Start of delivery on request.

Auxiliary switches and other accessories can be ordered separately (see "Accessories" page 7/32 onwards).

Selection and ordering data

Without auxiliary switches

Circuit breakers for system protection and non-motor loads according to UL/CSA



3RV2711-0AD10

Rated current[1]	Thermal overload releases (non-adjustable)	Instantaneous overcurrent release	Short-circuit breaking capacity at 480 Y/277 V AC[2]	DT	Screw terminals		PU (UNIT, SET, M)	PS*	PG
I_n[1]		$I >$	I_{bc}		Article No.	Price per PU			
A	A	A	kA						
Size S00									
0.16	0.16	2.1	65	B	**3RV2711-0AD10**		1	1 unit	41E
0.2	0.2	2.6	65	B	**3RV2711-0BD10**		1	1 unit	41E
0.25	0.25	3.3	65	B	**3RV2711-0CD10**		1	1 unit	41E
0.32	0.32	4.2	65	B	**3RV2711-0DD10**		1	1 unit	41E
0.4	0.4	5.2	65	B	**3RV2711-0ED10**		1	1 unit	41E
0.5	0.5	6.5	65	B	**3RV2711-0FD10**		1	1 unit	41E
0.63	0.63	8.2	65	B	**3RV2711-0GD10**		1	1 unit	41E
0.8	0.8	10	65	B	**3RV2711-0HD10**		1	1 unit	41E
1	1	13	65	B	**3RV2711-0JD10**		1	1 unit	41E
1.25	1.25	16	65	B	**3RV2711-0KD10**		1	1 unit	41E
1.6	1.6	21	65	B	**3RV2711-1AD10**		1	1 unit	41E
2	2	26	65	B	**3RV2711-1BD10**		1	1 unit	41E
2.5	2.5	33	65	B	**3RV2711-1CD10**		1	1 unit	41E
3.2	3.2	42	65	B	**3RV2711-1DD10**		1	1 unit	41E
4	4	52	65	B	**3RV2711-1ED10**		1	1 unit	41E
5	5	65	65	B	**3RV2711-1FD10**		1	1 unit	41E
6.3	6.3	82	65	B	**3RV2711-1GD10**		1	1 unit	41E
8	8	104	65	B	**3RV2711-1HD10**		1	1 unit	41E
10	10	130	65	B	**3RV2711-1JD10**		1	1 unit	41E
12.5	12.5	163	65	B	**3RV2711-1KD10**		1	1 unit	41E
15	15	208	65	B	**3RV2711-4AD10**		1	1 unit	41E
Size S0									
20	20	260	50	NEW B	**3RV2721-4BD10**		1	1 unit	41E
22	22	286	50	NEW B	**3RV2721-4CD10**		1	1 unit	41E

[1] Rated value 100 % according to UL 489 and IEC 60947-2 ("100 % rated breaker").

[2] Values for 600 Y/347 V AC, see page 7/15.

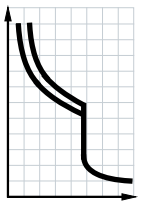
Lateral and transverse auxiliary switches can be ordered separately (see "Accessories" from page 7/32 onwards).

For transformer protection according to UL 489/CSA C22.2 No.5

Selection and ordering data

Without auxiliary switches

Circuit breakers for system and transformer protection according to UL/CSA, specially designed for transformers with high inrush current



3RV2811-0AD10

Rated current[1]	Thermal overload releases (non-adjustable)	Instantaneous overcurrent release	Short-circuit breaking capacity at 480 Y/277 V AC[2]	DT	Screw terminals		PU (UNIT, SET, M)	PS*	PG
I_n[1]		$I >$	I_{bc}		Article No.	Price per PU			
A	A	A	kA						
Size S00									
0.16	0.16	3.3	65	B	**3RV2811-0AD10**		1	1 unit	41E
0.2	0.2	4.2	65	B	**3RV2811-0BD10**		1	1 unit	41E
0.25	0.25	5.2	65	B	**3RV2811-0CD10**		1	1 unit	41E
0.32	0.32	6.5	65	B	**3RV2811-0DD10**		1	1 unit	41E
0.4	0.4	8.2	65	B	**3RV2811-0ED10**		1	1 unit	41E
0.5	0.5	10	65	B	**3RV2811-0FD10**		1	1 unit	41E
0.63	0.63	13	65	B	**3RV2811-0GD10**		1	1 unit	41E
0.8	0.8	16	65	B	**3RV2811-0HD10**		1	1 unit	41E
1	1	21	65	B	**3RV2811-0JD10**		1	1 unit	41E
1.25	1.25	26	65	B	**3RV2811-0KD10**		1	1 unit	41E
1.6	1.6	33	65	B	**3RV2811-1AD10**		1	1 unit	41E
2	2	42	65	B	**3RV2811-1BD10**		1	1 unit	41E
2.5	2.5	52	65	B	**3RV2811-1CD10**		1	1 unit	41E
3.2	3.2	65	65	B	**3RV2811-1DD10**		1	1 unit	41E
4	4	82	65	B	**3RV2811-1ED10**		1	1 unit	41E
5	5	104	65	B	**3RV2811-1FD10**		1	1 unit	41E
6.3	6.3	130	65	B	**3RV2811-1GD10**		1	1 unit	41E
8	8	163	65	B	**3RV2811-1HD10**		1	1 unit	41E
10	10	208	65	B	**3RV2811-1JD10**		1	1 unit	41E
12.5	12.5	260	65	B	**3RV2811-1KD10**		1	1 unit	41E
15	15	286	65	B	**3RV2811-4AD10**		1	1 unit	41E
Size S0									
20	20	325	50	NEW B	**3RV2821-4BD10**		1	1 unit	41E
22	22	364	50	NEW B	**3RV2821-4CD10**		1	1 unit	41E

[1] Rated value 100 % according to UL 489 and IEC 60947-2 ("100 % rated breaker").

[2] Values for 600 Y/347 V AC, see page 7/15.

Lateral and transverse auxiliary switches can be ordered separately (see "Accessories" from page 7/32 onwards).

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روبروی پالایشگاه نفت پارس، پلاک ۱۲

Overview

Mounting location and function

The 3RV2 motor starter protectors/circuit breakers have three main contact elements. In order to achieve maximum flexibility, auxiliary switches, signaling switches, auxiliary releases and isolator modules can be supplied separately.

These components are easily fitted to the switches without the use of any tools according to requirements.

Overview graphic, see page 7/7.

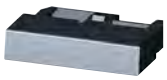
Front side Note: • A maximum of four auxiliary contacts with auxiliary switches can be mounted on each motor starter protector/circuit breaker.	**Transverse auxiliary switches, solid-state compatible transverse auxiliary switches** 1 NO + 1 NC or 2 NO or 1 CO	An auxiliary switch block can be inserted transversely on the front. The overall width of the motor starter protectors/circuit breakers remains unchanged.
Left-hand side Notes: • A maximum of four auxiliary contacts with auxiliary switches can be mounted on each motor starter protector/circuit breaker. • Lateral auxiliary switches (two contacts) and signaling switches can be mounted separately or together. • The signaling switch cannot be used for the 3RV27 and 3RV28 circuit breakers.	**Lateral auxiliary switches (2 contacts)** 1 NO + 1 NC or 2 NO or 2 NC	One of the three lateral auxiliary switches can be mounted on the left side per motor starter protector/circuit breaker. The contacts of the auxiliary switch close and open together with the main contacts of the motor starter protector/circuit breaker. The width of the lateral auxiliary switch with two contacts is 9 mm.
	Lateral auxiliary switches (4 contacts) 2 NO + 2 NC	One lateral auxiliary switch with four contacts can be mounted on the left side per motor starter protector/circuit breaker. The contacts of the auxiliary switch close and open together with the main contacts of the motor starter protector/circuit breaker. The width of the lateral auxiliary switch with four contacts is 18 mm.
	Signaling switches Tripping 1 NO + 1 NC Short circuit 1 NO + 1 NC	One signaling switch can be mounted on the left side of each motor starter protector. The signaling switch has two contact systems. One contact system always signals tripping irrespective of whether this was caused by a short circuit, an overload or an auxiliary release. The other contact system only switches in the event of a short circuit. There is no signaling as a result of switching off with the actuator. In order to be able to switch on the motor starter protector again after a short circuit, the signaling switch must be reset manually after the error cause has been eliminated. The overall width of the signaling switch is 18 mm.
Right-hand side Notes: • One auxiliary release can be mounted per motor starter protector/circuit breaker. • Accessories cannot be mounted at the right-hand side of the 3RV21 motor starter protectors for motor protection with overload relay function.	**Auxiliary releases**	
	Shunt releases	For remote-controlled tripping of the motor starter protector/circuit breaker. The release coil should only be energized for short periods (see circuit diagrams).
	or	
	Undervoltage releases	Trips the motor starter protector/circuit breaker when the voltage is interrupted and prevents the motor from being restarted accidentally when the voltage is restored. Used for remote-controlled tripping of the motor starter protector/circuit breaker. Particularly suitable for EMERGENCY-STOP disconnection by way of corresponding EMERGENCY-STOP pushbuttons according to DIN EN 60204-1.
	or	
	Undervoltage releases with leading auxiliary contacts 2 NO	Function and use as for the undervoltage release without leading auxiliary contacts, but with the following additional function: the auxiliary contacts will open in switch position OFF to deenergize the coil of the undervoltage release, thus interrupting energy consumption. In the "tripped" position, these auxiliary contacts are not guaranteed to open. The leading contacts permit the motor starter protector/circuit breaker to reclose. The overall width of the auxiliary release is 18 mm.
Top Notes: • The isolator module cannot be used for the 3RV27 and 3RV28 circuit breakers. • The isolator module for size S2 - can only be used with 3RV2 motor starter protectors/circuit breakers up to max. 65 A - cannot be used with the transverse auxiliary switch • The isolator module covers the terminal screws of the transverse auxiliary switch. If the isolator module is used, we therefore recommend that either the lateral auxiliary switches be fitted or that the isolator module not be mounted until the auxiliary switch has been wired.	**Isolator modules**	Isolator modules can be mounted to the upper connection side of the motor starter protectors. The supply cable is connected to the motor starter protector through the isolator module. The plug can only be unplugged when the motor starter protector is open and isolates all 3 poles of the motor starter protector from the network. The shock-protected isolation point is clearly visible and secured with a padlock to prevent reinsertion of the plug.

For a complete overview of which accessories can be used for the various motor starter protectors/circuit breakers, see page 7/2.

Mountable accessories

Selection and ordering data

PU (UNIT, SET, M) = 1
PS* = 1 unit (unless otherwise specified)
PG = 41E

	Version	For motor starter protectors/ circuit breakers Size	DT	Screw terminals Article No.	Price per PU	DT	Spring-type terminals Article No.	Price per PU
Auxiliary switches[1]								
 3RV2901-1E	**Transverse auxiliary switches** For front mounting							
	1 CO	S00 ... S2	▶	**3RV2901-1D**			--	
	1 NO + 1 NC[2]		▶	**3RV2901-1E**		▶	**3RV2901-2E**	
	2 NO		▶	**3RV2901-1F**		▶	**3RV2901-2F**	
 3RV2901-2E	**Electronic compatible transverse auxiliary switches** Mountable on the front, for operation in dusty atmosphere and in electronic circuits with low operating currents							
 3RV2901-1G	1 CO	S00 ... S2	A	**3RV2901-1G**			--	
 3RV2901-0H	**Covers for transverse auxiliary switches** (PKG* = 10 units)	S00 ... S2	▶	**3RV2901-0H**			--	
 3RV2901-1A  3RV2901-2A	**Lateral auxiliary switches** Mountable on the left							
	1 NO + 1 NC[2]	S00 ... S2	▶	**3RV2901-1A**		▶	**3RV2901-2A**	
	2 NO		▶	**3RV2901-1B**		▶	**3RV2901-2B**	
	2 NC		▶	**3RV2901-1C**		▶	**3RV2901-2C**	
	2 NO + 2 NC		A	**3RV2901-1J**			--	
Signaling switches[3]								
 3RV2921-1M  3RV2921-2M	**Signaling switches**[2] One signaling switch can be mounted on the left per motor starter protector. Separate tripped and short-circuit alarms, 1 NO + 1 NC each	S00 ... S2	▶	**3RV2921-1M**		▶	**3RV2921-2M**	
Isolator modules[3]								
 3RV2928-1A  3RV2938-1A	**Isolator modules**[4] Visible isolating distance for isolating individual motor starter protectors from the network, lockable in disconnected position	S00, S0	▶	**3RV2928-1A**			--	
		S2[4] NEW	A	**3RV2938-1A**			--	

[1] Each motor starter protector/circuit breaker can be fitted with one transverse and one lateral auxiliary switch. The lateral auxiliary switch with 2 NO + 2 NC is used without a transverse auxiliary switch.

[2] The 3RV29 auxiliary and signaling switches with 1 NO + 1 NC are also available with ring terminal lug connection. The Article No. must be changed in the 8th digit to **"4"**: e.g. 3RV2901-**4**E.

[3] This accessory cannot be used for the 3RV27 and 3RV28 circuit breakers.

[4] The isolator module for size S2 can be used only with 3RV2 motor starter protectors/circuit breakers up to max. 65 A. Similarly, it cannot be used with the transverse auxiliary switch.

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


3RV2902-1AV0


3RV2902-2AV0


3RV2922-1CP0


3RV2902-2DB0

Rated control supply voltage U_s					For motor starter protectors/ circuit breakers	DT	Screw terminals	DT	Spring-type terminals
AC 50 Hz	AC 60 Hz	AC 50/60 Hz 100 % ON period[1]	AC/DC 50/60 Hz, DC 5 s ON period[2]	DC			Article No. / Price per PU		Article No. / Price per PU
V	V	V	V	V	Size				
Auxiliary releases[3]									
Undervoltage releases									
--	--	--	--	24	S00 ... S2	A	**3RV2902-1AB4**		**--**
24	--	--	--	--	S00 ... S2	A	**3RV2902-1AB0**		**--**
110	120	--	--	--	S00 ... S2	A	**3RV2902-1AF0**		**--**
--	208	--	--	--	S00 ... S2	A	**3RV2902-1AM1**		**--**
230	240	--	--	--	S00 ... S2	[4] ▶	**3RV2902-1AP0**	▶	**3RV2902-2AP0**
400	440	--	--	--	S00 ... S2	[4] ▶	**3RV2902-1AV0**	▶	**3RV2902-2AV0**
415	480	--	--	--	S00 ... S2	A	**3RV2902-1AV1**		**--**
500	600	--	--	--	S00 ... S2	A	**3RV2902-1AS0**		**--**
Undervoltage releases with leading auxiliary contacts 2 NO									
24	24	--	--	--	S00 ... S2	B	**3RV2922-1CB0**		**--**
230	240	--	--	--	S00 ... S2	A	**3RV2922-1CP0**	A	**3RV2922-2CP0**
400	440	--	--	--	S00 ... S2	A	**3RV2922-1CV0**	A	**3RV2922-2CV0**
415	480	--	--	--	S00 ... S2	[4] A	**3RV2922-1CV1**	A	**3RV2922-2CV1**
Shunt releases									
--	--	20 ... 24	20 ... 70	--	S00 ... S2	▶	**3RV2902-1DB0**	▶	**3RV2902-2DB0**
--	--	90 ... 110	70 ... 190	--	S00 ... S2	[4] A	**3RV2902-1DF0**	A	**3RV2902-2DF0**
--	--	210 ... 240	190 ... 330	--	S00 ... S2	[4] ▶	**3RV2902-1DP0**	▶	**3RV2902-2DP0**
--	--	350 ... 415	330 ... 500	--	S00 ... S2	A	**3RV2902-1DV0**		**--**
--	--	500	500	--	S00 ... S2	A	**3RV2902-1DS0**		**--**

[1] The voltage range is valid for 100 % (infinite) ON period. The response voltage lies at 0.9 of the lower limit of the voltage range.

[2] The voltage range is valid for 5 s ON period at AC 50/60Hz and DC. The response voltage lies at 0.85 of the lower limit of the voltage range.

[3] One auxiliary release can be mounted on the right per motor starter protector/circuit breaker (does not apply to 3RV21 motor starter protectors with overload relay function).

[4] The 3RV29 auxiliary releases are also available with ring terminal lug connection. The Article No. must be changed in the 8th digit to **"4"**: e.g. 3RV2902-**4**AP0.

Overview

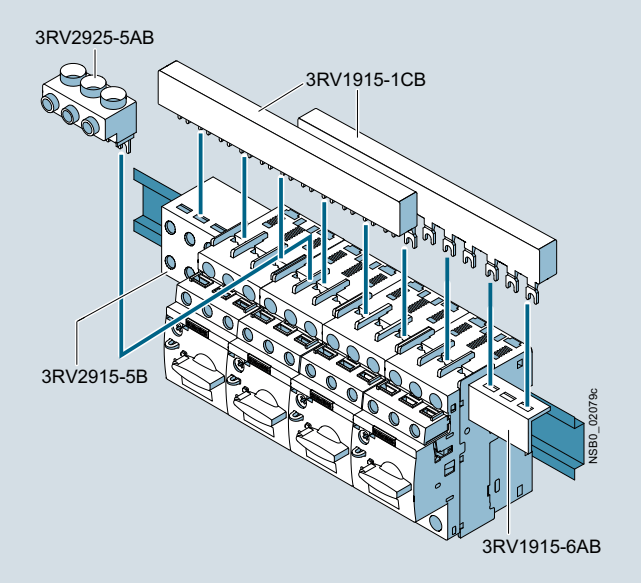
Insulated three-phase busbar system

Three-phase busbar systems provide an easy, time-saving and clearly arranged means of feeding 3RV2 motor starter protector/ circuit breakers with screw terminals. Different versions are available for sizes S00 to S2 and can be used for the various different types of motor starter protectors/circuit breakers (size S0 up to 32 A).

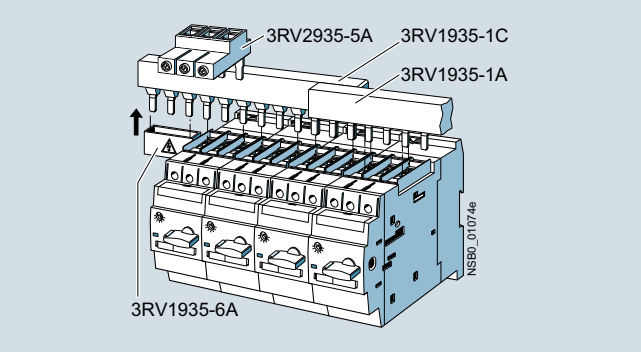
The 3RV1915 and 3RV1935 three-phase busbar systems are generally unsuitable for the 3RV21 motor starter protectors for motor protection with overload relay function and 3RV27 and 3RV28 circuit breakers according to UL 489/CSA C22.2 No. 5.

The busbars are suitable for between two and five motor starter protectors/circuit breakers. However, any kind of extension is possible by clamping the tags of an additional busbar (rotated by 180°) underneath the terminals of the respective last motor starter protector/circuit breaker.

A combination of motor starter protectors/circuit breakers of size S00 and S0 is possible. The motor starter protectors/circuit breakers are supplied by appropriate infeed terminals.



SIRIUS three-phase busbar system size S00/S0



SIRIUS three-phase busbar system size S2

The three-phase busbar systems are finger-safe. They are designed for any short-circuit stress which can occur at the output side of connected motor starter protectors/circuit breakers.

The three-phase busbar systems can also be used to construct "Type E Starters" according to UL/CSA. Special infeed terminals must be used for this purpose, however (see "Selection and Ordering Data", page 7/35).

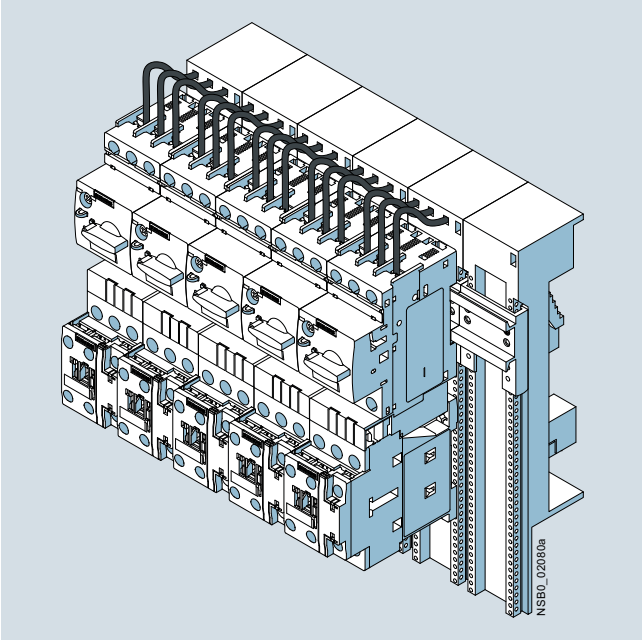
8US busbar adapters for 60 mm systems

The motor starter protectors/circuit breakers are mounted directly with the aid of busbar adapters on busbar systems with 60 mm center-to-center clearance in order to save space and to reduce infeed times and costs.

The busbar adapters for busbar systems with 60 mm center-to-center clearance are suitable for copper busbars with a width of 12 mm to 30 mm. The busbars can be 5 mm or 10 mm thick.

The motor starter protectors/circuit breakers are snapped onto the adapter and connected on the line side. This prepared unit is then plugged directly onto the busbar system, and is thus connected both mechanically and electrically at the same time.

For further busbar adapters for snap-mounting direct-on-line starters and reversing starters as well as additional accessories such as line terminals and outgoing terminals, flat copper profile, etc., see Catalog LV 10 "Low-Voltage Power Distribution and Electrical Installation Technology".



SIRIUS load feeders with busbar adapters snapped onto busbars

Selection and ordering data

Three-phase busbars[1]


3RV1915-1AB


3RV1915-1BB


3RV1915-1CB


3RV1915-1DB

For feeding several motor starter protectors with screw terminals, mounted side by side on standard mounting rails, insulated, with touch protection

Modular spacing	Number of motor starter protectors that can be connected: Without lateral accessories	With lateral auxiliary switch	With auxiliary release	Rated current I_n at 690 V	For motor starter protectors	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
mm				A	Size						
45[3]	2	--	--	63	S00, S0[2]	▶	**3RV1915-1AB**		1	1 unit	41E
	3	--	--	63	S00, S0[2]	▶	**3RV1915-1BB**		1	1 unit	41E
	4	--	--	63	S00, S0[2]	▶	**3RV1915-1CB**		1	1 unit	41E
	5	--	--	63	S00, S0[2]	▶	**3RV1915-1DB**		1	1 unit	41E
55[4]	--	2	--	63	S00, S0[2]	▶	**3RV1915-2AB**		1	1 unit	41E
	--	3	--	63	S00, S0[2]	▶	**3RV1915-2BB**		1	1 unit	41E
	--	4	--	63	S00, S0[2]	▶	**3RV1915-2CB**		1	1 unit	41E
	--	5	--	63	S00, S0[2]	▶	**3RV1915-2DB**		1	1 unit	41E
	2	--	--	108	S2	▶	**3RV1935-1A**		1	1 unit	41E
	3	--	--	108	S2	▶	**3RV1935-1B**		1	1 unit	41E
	4	--	--	108	S2	▶	**3RV1935-1C**		1	1 unit	41E
63[5]	--	--	2	63	S00, S0[2]	▶	**3RV1915-3AB**		1	1 unit	41E
	--	--	4	63	S00, S0[2]	▶	**3RV1915-3CB**		1	1 unit	41E
75[5]	--	2	2	108	S2	▶	**3RV1935-3A**		1	1 unit	41E
	--	3	3	108	S2	▶	**3RV1935-3B**		1	1 unit	41E
	--	4	4	108	S2	▶	**3RV1935-3C**		1	1 unit	41E

1) Not suitable for 3RV21 motor starter protectors for motor protection with overload relay function and for 3RV27 and 3RV28 circuit breakers according to UL 489/CSA C22.2 No. 5.

2) Approved for motor starter protectors size S0 with $I_n \leq 32$ A.

3) For 3RV2 motor starter protectors without accessories mounted on the side.

4) For 3RV2 motor starter protectors with auxiliary switches with 1 NO + 1 NC, 2 NO and 2 NC mounted on the left (9 mm wide).

5) For 3RV2 motor starter protectors with mounted accessories (18 mm wide). Auxiliary switches with 2 NO + 2 NC or signaling switch (mounted on the left) or with auxiliary release (mounted on the right).

Three-phase infeed terminals


3RV2925-5AB


3RV2935-5A

Connection from top

Conductor cross-section: Solid or stranded	Finely stranded with end sleeve	AWG cables, solid or stranded	Tightening torque	For motor starter protectors/ circuit breakers	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
mm²	mm²	AWG	Nm	Size						
2.5 ... 25	2.5 ... 16	10 ... 4	3 ... 4	S00, S0	▶	**3RV2925-5AB**		1	1 unit	41E
2 x (2.5 ... 50)[1], 1 x (2.5 ... 70)[1]	2 x (2.5 ... 35)[1], 1 x (2.5 ... 50)[1]	2 x (10 ... 1/0)[1], 1 x (10 ... 2/0)[1]	4 ... 6	S2 NEW	A	**3RV2935-5A**		1	1 unit	41E


3RV2915-5B

Connection from below

This terminal is connected in place of a switch, please take the space requirement into account.

2.5 ... 25	2.5 ... 16	10 ... 4	Input: 4, Output: 2 ... 2.5	S00, S0	▶	**3RV2915-5B**		1	1 unit	41E

Three-phase infeed terminals for constructing "Type E Starters"


3RV2925-5EB


3RV2935-5E

Connection from top

2.5 ... 25	2.5 ... 16	10 ... 4	3 ... 4	S00, S0	A	**3RV2925-5EB**		1	1 unit	41E
2 x (2.5 ... 50)[1], 1 x (2.5 ... 70)[1]	2 x (2.5 ... 35)[1], 1 x (2.5 ... 50)[1]	2 x (10 ... 1/0)[1], 1 x (10 ... 2/0)[1]	4 ... 6	S2 NEW	A	**3RV2935-5E**		1	1 unit	41E

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

Busbar accessories

	Version	For motor starter protectors/ circuit breakers Size	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Covers for connection tags								
 3RV1915-6AB	Touch protection for empty positions	S00, S0	▶	**3RV1915-6AB**		1	10 units	41E
		S2	▶	**3RV1935-6A**		1	5 units	41E

Busbar adapters


8US1251-5DS10


8US1251-5DT11


8US1250-5AS10


8US1250-5AT10

For motor starter protectors/ circuit breakers Size	Rated current A	Connecting cable AWG	Adapter length mm	Adapter width mm	Rated voltage V	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Busbar adapters for 60 mm systems											
For flat copper profiles according to DIN 46433 Width: 12 mm and 30 mm Thickness: 5 mm and 10 mm also for T and double-T special profiles											
• For motor starter protectors/circuit breakers with screw terminals							**Screw terminals** ⊕				
S00, S0	25	12	200	45	690	▶	**8US1251-5DS10**		1	1 unit	14O
S0	32	10	260	45	690	▶	**8US1251-5NT10**		1	1 unit	14O
S2	80	4	200	55	690	NEW A	**8US1261-5MS13**		1	1 unit	14O
S2	80	4	260	55	690	NEW A	**8US1261-6MT10**		1	1 unit	14O
S2[1)]	80	4	260	118	690	NEW A	**8US1211-6MT10**		1	1 unit	14O
• For motor starter protectors/circuit breakers with spring-type terminals							**Spring-type terminals**				
S00, S0	25	12	200	45	690	▶	**8US1251-5DS11**		1	1 unit	14O
S00, S0	25	12	260	45	690	▶	**8US1251-5DT11**		1	1 unit	14O
S0	32	10	260	45	690	▶	**8US1251-5NT11**		1	1 unit	14O
Accessories											
Device holders For lateral mounting to busbar adapters	--	--	200	45	--	▶	**8US1250-5AS10**		1	1 unit	14O
	--	--	260	45	--	▶	**8US1250-5AT10**		1	1 unit	14O
Side modules For widening of busbar adapters	--	--	200	9	--	A	**8US1998-2BJ10**		1	10 units	14O
Spacers For fixing the load feeder onto the busbar adapter	--	--	--	--	--	▶	**8US1998-1BA10**		1	50 units	14O
Vibration and shock kits For high vibration and shock loads											
S00/S0	--	--	--	--	--	▶	**8US1998-1CA10**		1	2 units	14O
S2	--	--	--	--	--	NEW A	**8US1998-1DA10**	**20.40**	1	1 unit	14O

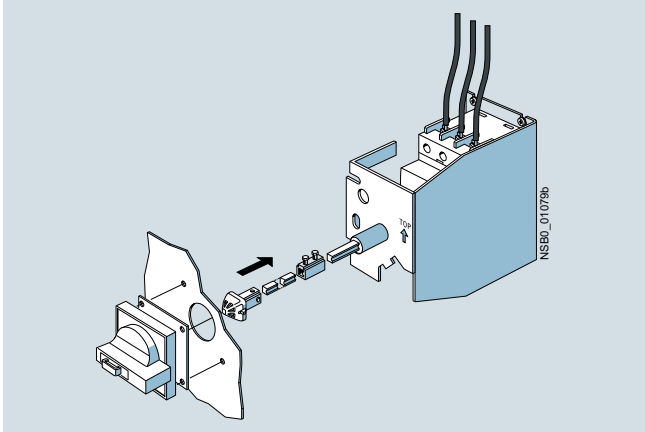
[1)] For the assembly of feeders for reversing starters comprising a motor starter protector and two contactors.

For additional busbar adapters, see Catalog LV 10 "Low-Voltage Power Distribution and Electrical Installation Technology".

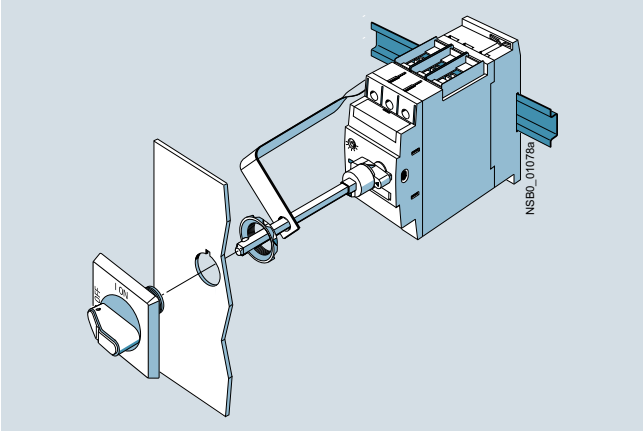
Overview

Door-coupling rotary operating mechanisms

Motor starter protectors/circuit breakers with a rotary operating mechanism can be mounted in a control cabinet and operated externally by means of a door-coupling rotary operating mechanism. When the cabinet door with motor starter protector/circuit breaker is closed, the operating mechanism is coupled. When the motor starter protector/circuit breaker closes, the coupling is locked which prevents the door from being opened unintentionally. This interlock can be defeated by the maintenance personnel. In the OPEN position, the rotary operating mechanism can be secured against reclosing with up to three padlocks. Inadvertent opening of the door is not possible in this case either.

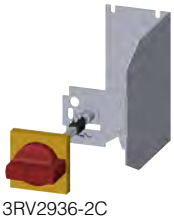


SIRIUS 3RV2926-2B door-coupling rotary operating mechanisms for arduous conditions



SIRIUS 3RV2926-0K door-coupling rotary operating mechanism

Selection and ordering data

Version	Color of handle	Version of extension shaft	For motor starter protectors/ circuit breakers	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
		mm	Size						
Door-coupling rotary operating mechanisms									
 3RV2926-0B	The door-coupling rotary operating mechanisms consist of a knob, a coupling driver and a 130/330 mm long extension shaft (6 mm x 6 mm). The door-coupling rotary operating mechanisms are designed to degree of protection IP64. The door locking device prevents accidental opening of the control cabinet door in the ON position of the motor starter protector/circuit breaker. The OFF position can be locked with up to three padlocks.								
Door-coupling rotary operating mechanisms	Black	130	S00 ... S2	▶	**3RV2926-0B**	1	1 unit		41E
		330	S00 ... S2	▶	**3RV2926-0K**	1	1 unit		41E
EMERGENCY-STOP door-coupling rotary operating mechanisms	Red/yellow	130	S00 ... S2	▶	**3RV2926-0C**	1	1 unit		41E
		330	S00 ... S2	▶	**3RV2926-0L**	1	1 unit		41E
Door-coupling rotary operating mechanisms for arduous conditions									
 3RV2926-2B	The door-coupling rotary operating mechanisms consist of a knob, a coupling driver, an extension shaft of 300 mm in length (8 mm x 8 mm), a spacer and two metal brackets, into which the motor starter protector/circuit breaker is inserted. The door-coupling rotary operating mechanisms are designed to degree of protection IP65. The door interlocking reliably prevents opening of the control cabinet door in the ON position of the motor starter protector/circuit breaker. The OFF position can be locked with up to three padlocks. Laterally mountable auxiliary releases and two-pole auxiliary switches can be used. The door-coupling rotary operating mechanisms thus meet the requirements for isolating functions according to IEC 60947-2.								
Door-coupling rotary operating mechanisms	Gray	300	S00, S0	▶	**3RV2926-2B**	1	1 unit		41E
			S2 NEW	▶	**3RV2936-2B**	1	1 unit		41E
EMERGENCY STOP door-coupling rotary operating mechanisms	Red/yellow	300	S00, S0	▶	**3RV2926-2C**	1	1 unit		41E
 3RV2936-2C			S2 NEW	▶	**3RV2936-2C**	1	1 unit		41E

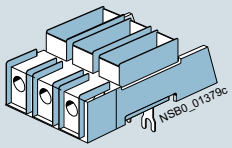
* You can order this quantity or a
Illustrations are approximate

Overview

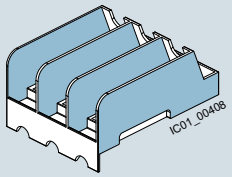
Accessories for "Self-Protected Combination Motor Controllers (Type E)" according to UL 508/UL 60947-4-1

The 3RV20 motor starter protectors with screw terminals are approved according to UL 508/UL 60947-4-1 as "Self-Protected Combination Motor Controllers (Type E)".

This requires increased clearance and creepage distances (1 inch and 2 inches respectively) at the input side of the device, which are achieved by mounting a terminal block or a phase barrier.



SIRIUS 3RV2928-1H terminal block



SIRIUS 3RV2938-1K phase barrier

Motor starter protectors/ circuit breakers	Size	Essential accessories for "Self-Protected Combination Motor Controllers (Type E)" according to UL 508/UL 60947-4-1
3RV201., 3RV202.	S00/S0	3RV2928-1H terminal block or 3RV2928-1K phase barrier
3RV2031-4B1., 3RV2031-4D.1., 3RV2031-4E1., 3RV2031-4P.1., 3RV2031-4S.1., 3RV2031-4T.1., 3RV2031-4U.1., 3RV2031-4V.1.	S2	--
3RV2031-4J.1., 3RV2031-4K.1., 3RV2031-4R.1., 3RV2031-4W.1., 3RV2031-4X.1., 3RV2032	S2	3RV2938-1K phase barrier

-- No accessories needed

Special three-phase infeed terminals are required for constructing "Type E Starters" with an insulated three-phase busbar system (see "Busbar Accessories", page 7/35).

The 3RV29 infeed system also enables the assembly of "Type E Starters", see page 7/46 onwards.

Note:

According to CSA, these terminal blocks and the phase barriers can be omitted when the device is used as a "Self-Protected Combination Motor Controller (Type E)".

Link modules

Feeders can be easily assembled from single devices with the help of the link modules. The following table shows the different combination options for devices with screw or spring-type terminals.

Combination devices	3RV2 motor starter protectors/ circuit breakers Size	3RT2 contactors; 3RW30, 3RW40 soft starters; 3RF34 solid-state contactors Size	Link modules Screw terminals	Spring-type terminals
Link modules for connecting switching devices to 3RV2 motor starter protectors/circuit breakers[1)]				
3RT2 contactors with AC or DC coil	S00	S00	3RA1921-1DA00	3RA2911-2AA00
	S0	S00		--
	S2	S2	3RA2931-1AA00	--
3RT2 contactors with AC coil	S0	S0	3RA2921-1AA00	3RA2921-2AA00
	S00	S0		--
3RT2 contactors with DC coil	S0	S0	3RA2921-1BA00	3RA2921-2AA00
	S00	S0		--
3RW30 soft starters	S00	S00	3RA2921-1BA00	3RA2911-2GA00
	S0	S00		--
3RW30/ 3RW40 soft starters	S0	S0	3RA2921-1BA00	3RA2921-2GA00
	S00	S0		--
	S2[2)]	S2[2)]	3RA2931-1AA00	--
3RF34 solid-state contactors	S00/S0	S00	3RA2921-1BA00	--
Hybrid link modules for connecting contactors with spring-type terminals to 3RV2 motor starter protectors/circuit breakers with screw terminals[3)]				
3RT2 contactors with AC or DC coil	S00	S00	3RA2911-2FA00	--
	S0	S0	3RA2921-2FA00	--

-- Version not possible

1) The link modules cannot be used for the 3RV2.21-4PA1., 3RV2.21-4FA1., 3RV2.31-4K.1., 3RV2.31-4R.1., 3RV2.32-4K.1., 3RV2.32-4R.1., 3RV27 and 3RV28 motor starter protectors/circuit breakers.

2) To assemble the feeder between a motor starter protector and a soft starter in size S2, the 3RA2932-1AC00 standard mounting rail adapter must be used.

3) The motor starter protector to contactor hybrid link modules cannot be used for the 3RV2.21-4PA1., 3RV2.21-4FA1., 3RV27 and 3RV28 motor starter protectors/circuit breakers. They are only suitable for constructing direct-on-line starters.

Note:

- Link modules can be used in
  - Sizes S00 and S0: up to max. 32 A
  - Size S2: up to max. 65 A
- Hybrid link modules can be used in
  - Sizes S00 and S0: up to max. 32 A

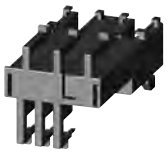
Selection and ordering data

Accessories

	Version	For motor starter protectors/ circuit breakers Size		DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Covers									
 3RV2908-0P	**Scale covers** Sealable, for covering the set current scale	3RV20, 3RV21, 3RV24: S00 ... S2		▶	**3RV2908-0P**		100	10 units	41E
 3RT2936-4EA2	**Covers for devices with screw terminals (box terminals)** Additional touch protection for fastening to the box terminals (2 units required per device)				**Screw terminals**				
	• Main current level	S2	NEW	B	**3RT2936-4EA2**		1	1 unit	41B
 3RV2928-4AA00	**Covers for devices with ring terminal lug connection** (ensure finger-safety)				**Ring terminal lug connections**				
	• Main current level	3RV20: S00, S0		B	**3RV2928-4AA00**		1	1 unit	41E
 3RV2908-4AA10	• For transverse auxiliary switches			B	**3RV2908-4AA10**		1	1 unit	41E
Fixing accessories									
 3RV2928-0B	**Push-in lugs** For screwing the motor starter protector/ circuit breakers onto mounting plates For each motor starter protector/circuit breakers, two units are required.	S00, S0		A	**3RV2928-0B**		100	10 units	41E
Tools for opening spring-type terminals									
 3RA2908-1A	**Screwdrivers** For all SIRIUS devices with spring-type terminals				**Spring-type terminals**				
	Length approx. 200 mm, 3.0 mm x 0.5 mm, titanium gray/black, partially insulated	S00 ... S2		A	**3RA2908-1A**		1	1 unit	41B
Terminal blocks and phase barriers for "Self-Protected Combination Motor Controllers (Type E)" according to UL 508/UL 60947-4-1									
 3RV2928-1H	Note: UL 508/UL 60947-4-1 approval demands 1-inch clearance and 2-inch creepage distance for "Self-Protected Combination Motor Controllers (Type E)". The following terminal blocks or phase barriers must be used for the 3RV20 motor starter protectors with screw terminals. The construction of 3RV20 motor starter protectors with spring-type terminals with the 3RV29 infeed system is also approved as "Self-Protected Combination Motor Controllers (Type E)" according to UL 508/UL 60947-4-1. The terminal block or phase barriers cannot be used in combination with the 3RV19.5 three-phase busbars. For construction with three-phase busbars, see "Busbar Accessories" page 7/34 onwards.								
 3RV2928-1K	**Terminal blocks type E** For extended clearance and creepage distances (1 and 2 inch)	S00, S0		▶	**3RV2928-1H**		1	1 unit	41E
 3RV2938-1K	**Phase barriers** For extended clearance and creepage distances (1 and 2 inch)	S00, S0		▶	**3RV2928-1K**		1	1 unit	41E
		S2	NEW	A	**3RV2938-1K**		1	1 unit	41E

Mounting accessories

Link modules

	Actuating voltage of contactor	Size 3RT2 contactors	Size 3RV2 motor starter protectors/ circuit breakers	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Link modules for motor starter protector to contactor[1]									
 3RA2921-1AA00	For mechanical and electrical connection between motor starter protector and contactor with screw terminals				**Screw terminals**				
	Single-unit packaging								
	AC/DC	S00	S00/S0	▶	**3RA1921-1DA00**		1	1 unit	41B
	AC	S0	S00/S0	A	**3RA2921-1AA00**		1	1 unit	41B
	DC	S0	S00/S0	A	**3RA2921-1BA00**		1	1 unit	41B
	AC/DC	S2	S2	NEW A	**3RA2931-1AA00**		1	1 unit	41B
 3RA2931-1AA00	**Multi-unit packaging**								
	AC/DC	S00	S00/S0	▶	**3RA1921-1D**		1	10 units	41B
	AC	S0	S00/S0	A	**3RA2921-1A**		1	10 units	41B
	DC	S0	S00/S0	A	**3RA2921-1B**		1	10 units	41B
	AC/DC	S2	S2	NEW A	**3RA2931-1A**		1	5 units	41B
 3RA2911-2AA00	For mechanical and electrical connection between motor starter protector and contactor with spring-type terminals				**Spring-type terminals**				
	Single-unit packaging								
	AC/DC	S00	S00	▶	**3RA2911-2AA00**		1	1 unit	41B
	AC[2]	S0	S0	▶	**3RA2921-2AA00**		1	1 unit	41B
	DC	S0	S0	▶	**3RA2921-2AA00**		1	1 unit	41B
	Multi-unit packaging								
	AC/DC	S00	S00	▶	**3RA2911-2A**		1	10 units	41B
	AC[2]	S0	S0	▶	**3RA2921-2A**		1	10 units	41B
	DC	S0	S0	▶	**3RA2921-2A**		1	10 units	41B
 3RA2911-1CA00	**Spacers[2]** For compensating the height on AC contactors								
	Single-unit packaging	S0	S0	A	**3RA2911-1CA00**		1	1 unit	41B
	Multi-unit packaging	S0	S0	A	**3RA2911-1C**		1	5 units	41B

Note:

Link modules can be used in

- Sizes S00 and S0 up to max. 32 A
- Size S2 up to max. 65 A

[1] The link modules from motor starter protector to contactor cannot be used for the 3RV2.21-4PA1., 3RV2.21-4FA1., 3RV2.31-4K.1., 3RV2.31-4R.1., 3RV2.32-4K.1., 3RV2.32-4R.1., 3RV27 and 3RV28 motor starter protectors/ circuit breakers.

[2] A spacer for height compensation on AC contactors size S0 is optionally available.

Size		DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
3RW30, 3RW40 soft starters; 3RF34 solid-state contactors	3RV2 motor starter protectors/circuit breakers						
Link modules for motor starter protector to soft starter[1] and motor starter protector to solid-state contactor							
 3RA2921-1BA00	Connection between motor starter protector and soft starter / solid-state contactor with screw terminals		**Screw terminals**				
	Single-unit packaging						
	S00	S00/S0	A	**3RA2921-1BA00**	1	1 unit	41B
	S0	S00/S0	A	**3RA2921-1BA00**	1	1 unit	41B
	S2[2]	S2	NEW A	**3RA2931-1AA00**	1	1 unit	41B
	Multi-unit packaging						
 3RA2931-1AA00	S00	S00/S0	A	**3RA2921-1B**	1	10 units	41B
	S0	S00/S0	A	**3RA2921-1B**	1	10 units	41B
	S2[2]	S2	NEW A	**3RA2931-1A**	1	5 units	41B
 3RA2921-2GA00	Connection between motor starter protector and soft starter spring-type terminals		**Spring-type terminals**				
	Single-unit packaging						
	S00	S00	▶	**3RA2911-2GA00**	1	1 unit	41B
	S0	S0	▶	**3RA2921-2GA00**	1	1 unit	41B
	Multi-unit packaging						
	S00	S00	▶	**3RA2911-2G**	1	10 units	41B
	S0	S0	▶	**3RA2921-2G**	1	10 units	41B

Note:

Link modules can be used in

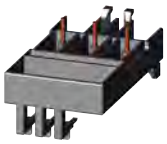
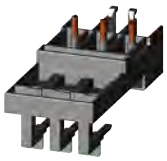
- Sizes S00 and S0 up to max. 32 A
- Size S2 up to max. 65 A

1) The link modules from motor starter protector to soft starter and from motor starter protector to solid-state contactor cannot be used for the 3RV2.21-4PA1., 3RV2.21-4FA1., 3RV2.31-4K.1., 3RV2.31-4R.1., 3RV2.32-4K.1., 3RV2.32-4R.1., 3RV27 and 3RV28 motor starter protectors/circuit breakers.

2) To assemble the feeder between a motor starter protector and a soft starter in size S2, the 3RA2932-1AC00 standard mounting rail adapter must be used.

7

Mounting accessories

Actuating voltage of contactor	Size 3RT2 contactors	Size 3RV2 motor starter protectors	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Hybrid link modules for motor starter protector to contactor[1]								
 3RA2911-2FA00	Mechanical and electrical connection between motor starter protector with screw terminals and contactor with spring-type terminals							
	Single-unit packaging							
AC/DC	S00	S00	▶	**3RA2911-2FA00**		1	1 unit	41B
AC[2]/DC	S0	S0	▶	**3RA2921-2FA00**		1	1 unit	41B
 3RA2921-2FA00	**Multi-unit packaging**							
AC/DC	S00	S00	▶	**3RA2911-2F**		1	10 units	41B
AC[2]/DC	S0	S0	▶	**3RA2921-2F**		1	10 units	41B
 3RA2911-1CA00	**Spacers[2]** For compensating the height on AC contactors							
Single-unit packaging	S0	S0	A	**3RA2911-1CA00**		1	1 unit	41B
Multi-unit packaging	S0	S0	A	**3RA2911-1C**		1	5 units	41B

Note:

Hybrid link modules in sizes S00 and S0 up to max. 32 A can be used.

1) The hybrid link modules for motor starter protector to contactor cannot be used for the 3RV2.21-4PA1., 3RV2.21-4FA1., 3RV27 and 3RV28 motor starter protectors/circuit breakers. They are only suitable for constructing direct-on-line starters.

2) A spacer for height compensation on AC contactors size S0 is optionally available.

More information

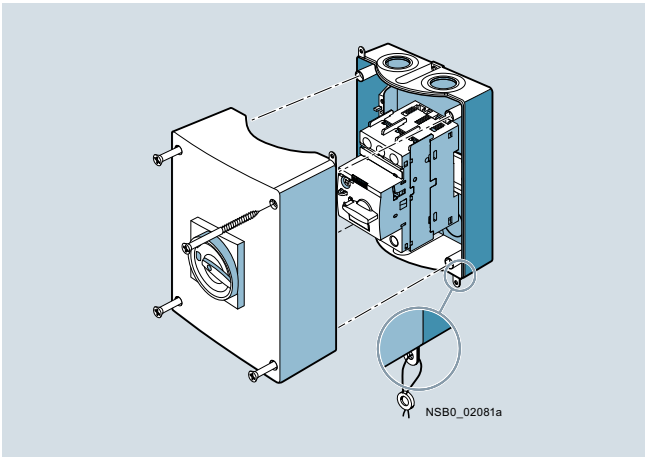
Overview

Enclosures

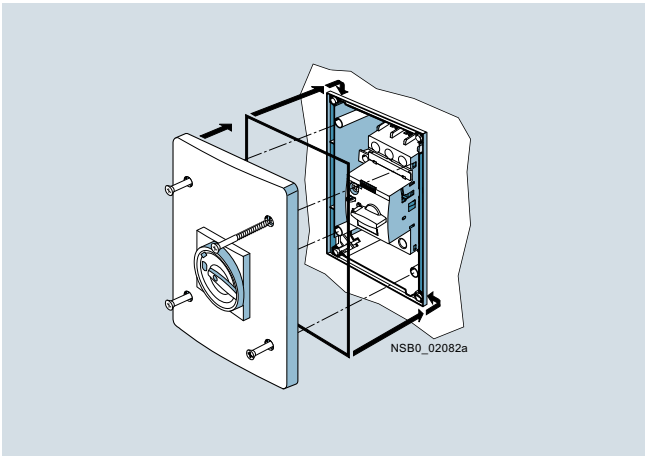
For stand-alone installation of 3RV20 to 3RV24 motor starter protectors size S00 ($I_{n\,max}$ = 16 A), S0 ($I_{n\,max}$ = 32 A) and S2 ($I_{n\,max}$ = 65 A), cast aluminum enclosures for surface mounting and molded-plastic enclosures for flush mounting are available in various dimensions.

When installed in a molded-plastic enclosure the motor starter protectors have a rated operational voltage U_e of 500 V.

The enclosures for surface mounting have the degree of protection IP55; the enclosures for flush mounting also comply with the degree of protection IP55 at the front (the flush-mounted section complies with IP20).



Enclosures for surface mounting



Enclosures (only for sizes S00 and S0)

All enclosures are equipped with N and PE terminals. There are two knock-out cable entries for cable glands at the top and two at the bottom; also on the rear corresponding cable entries are scored. There is a knockout on the top of the enclosure for indicator lights that are available as accessories.

The narrow enclosure can accommodate a motor starter protector without accessories, with transverse auxiliary switch and with lateral auxiliary switch. There is no provision for installing a motor starter protector with a signaling switch.

With size S00 to S2 circuit breakers the molded-plastic enclosures are equipped with a rotary operating mechanism.

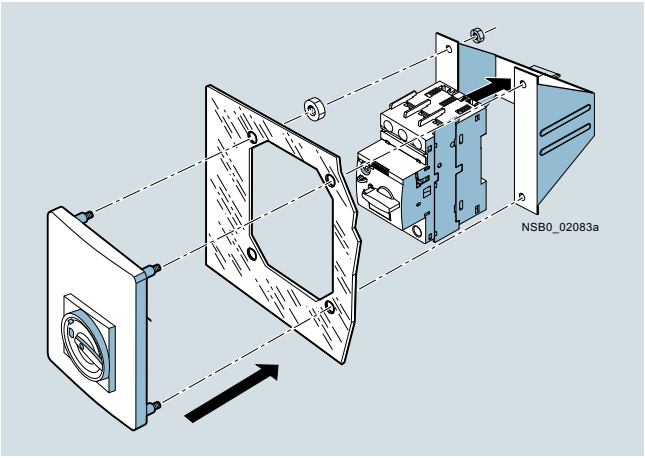
The enclosures can be supplied with either a black rotary operating mechanism or with an EMERGENCY-STOP rotary operating mechanism with a red/yellow knob.

In the OFF setting, all rotary operating mechanisms can be locked with up to three padlocks.

Front plates

Motor starter protectors are frequently required to be actuated in any enclosure. Front plates equipped with a rotary operating mechanism for 3RV20 to 3RV24 motor starter protectors sizes S00 to S2 are available for this purpose.

A holder for the motor starter protectors size S00 and S0, into which the motor starter protectors can be snapped, is available for the front plates.



Front plate (including holder) for sizes S00 and S0

Enclosures and front plates

Selection and ordering data

	Version	Degree of protection	Integrated terminals	Width	For 3RV20 to 3RV24 motor starter protectors	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
				mm	Size						
Molded-plastic enclosures for surface mounting[1]											
 3RV1933-1DA00	**With rotary operating mechanism,** lockable in 0 position	IP55	N and PE/ ground	54 (for motor starter protector + lateral auxiliary switch)	S00, S0	▶	**3RV1923-1CA00**		1	1 unit	41E
				72 (for motor starter protector + lateral auxiliary switch[2] + auxiliary release)	S00, S0	▶	**3RV1923-1DA00**		1	1 unit	41E
				82 (for motor starter protector + lateral auxiliary switch[2] + auxiliary release)	S2	A	**3RV1933-1DA00**		1	1 unit	41E
 3RV1923-1FA00, 3RV1933-1GA00	**With EMER-GENCY-STOP rotary operating mechanism,** lockable in 0 position	IP55	N and PE/ ground	54 (for motor starter protector + lateral auxiliary switch)	S00, S0	▶	**3RV1923-1FA00**		1	1 unit	41E
				72 (for motor starter protector + lateral auxiliary switch[2] + auxiliary release)	S00, S0	▶	**3RV1923-1GA00**		1	1 unit	41E
				82 (for motor starter protector + lateral auxiliary switch[2] + auxiliary release)	S2	A	**3RV1933-1GA00**		1	1 unit	41E
Cast aluminum enclosures for surface mounting[1]											
 3RV1923-1DA01	**With rotary operating mechanism,** lockable in 0 position	IP65	PE[3]	72 (for motor starter protector + lateral auxiliary switch[2] + auxiliary release)	S00, S0	▶	**3RV1923-1DA01**		1	1 unit	41E
	With EMER-GENCY-STOP rotary operating mechanism, lockable in 0 position	IP65	PE[3]	72 (for motor starter protector + lateral auxiliary switch[2] + auxiliary release)	S00, S0	▶	**3RV1923-1GA01**		1	1 unit	41E
Molded-plastic enclosures for flush mounting[4]											
 3RV1923-2DA00	**With rotary operating mechanism,** lockable in 0 position	IP55 (front side)	N and PE/ ground	72 (for motor starter protector + lateral auxiliary switch[2] + auxiliary release)	S00, S0	A	**3RV1923-2DA00**		1	1 unit	41E
	With EMER-GENCY-STOP rotary operating mechanism, lockable in 0 position	IP55 (front side)	N and PE/ ground	72 (for motor starter protector + lateral auxiliary switch[2] + auxiliary release)	S00, S0	A	**3RV1923-2GA00**		1	1 unit	41E

1) The rear cable glands cannot be used on 3RV2.11-...2. and 3RV2.21-...2. devices with spring-type terminals.

2) Only valid for lateral auxiliary switches with two auxiliary contacts.

3) If required, an additional N terminal can be mounted (e.g. 8WA1011-1BG11).

4) Not suitable for 3RV2.11-...2. and 3RV2.21-...2. devices with spring-type terminals.

	Version	Degree of protection	For 3RV20 to 3RV24 motor starter protectors	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
			Size						
Front plates									
 3RV1923-4B + 3RV1923-4G	**Molded-plastic front plates with rotary operating mechanism,** lockable in 0 position For actuation of 3RV2 motor starter protectors in any enclosure	IP55 (front side)	S00 ... S2	▶	**3RV1923-4B**		1	1 unit	41E
	Molded-plastic front plates with EMERGENCY-STOP rotary operating mechanism, red/yellow, lockable in 0 position EMERGENCY-STOP actuation of 3RV2 motor starter protectors in any enclosure	IP55 (front side)	S00 ... S2	A	**3RV1923-4E**		1	1 unit	41E
	Holders for front plates Holder is mounted on front plate, motor starter protector with and without accessories is snapped in.	--	S00, S0	▶	**3RV1923-4G**		1	1 unit	41E

	Version	Rated control supply voltage U_s	For 3RV20 to 3RV24 motor starter protectors	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
		V	Size						
Indicator lights									
 3RV1903-5B	**Indicator lights** For all enclosures and front plates • With LED lamp for versions 110 ... 120 V, with glow lamp for versions 220 ... 500 V • With colored lenses red, green, yellow, orange and clear	110 ... 120 220 ... 240 380 ... 415 480 ... 500	S00 ... S2	C C C C	**3RV1903-5B** **3RV1903-5C** **3RV1903-5E** **3RV1903-5G**		1 1 1 1	1 unit 1 unit 1 unit 1 unit	41E 41E 41E 41E

3RV29 infeed system

Overview

The 3RV29 infeed system is a convenient means of energy supply and distribution for a group of several motor starter protectors or complete load feeders with a screw or spring-type connection in sizes S00 and S0 (exception: this system cannot be used for the 3RV21, 3RV27 and 3RV28 motor starter protectors/circuit breakers).

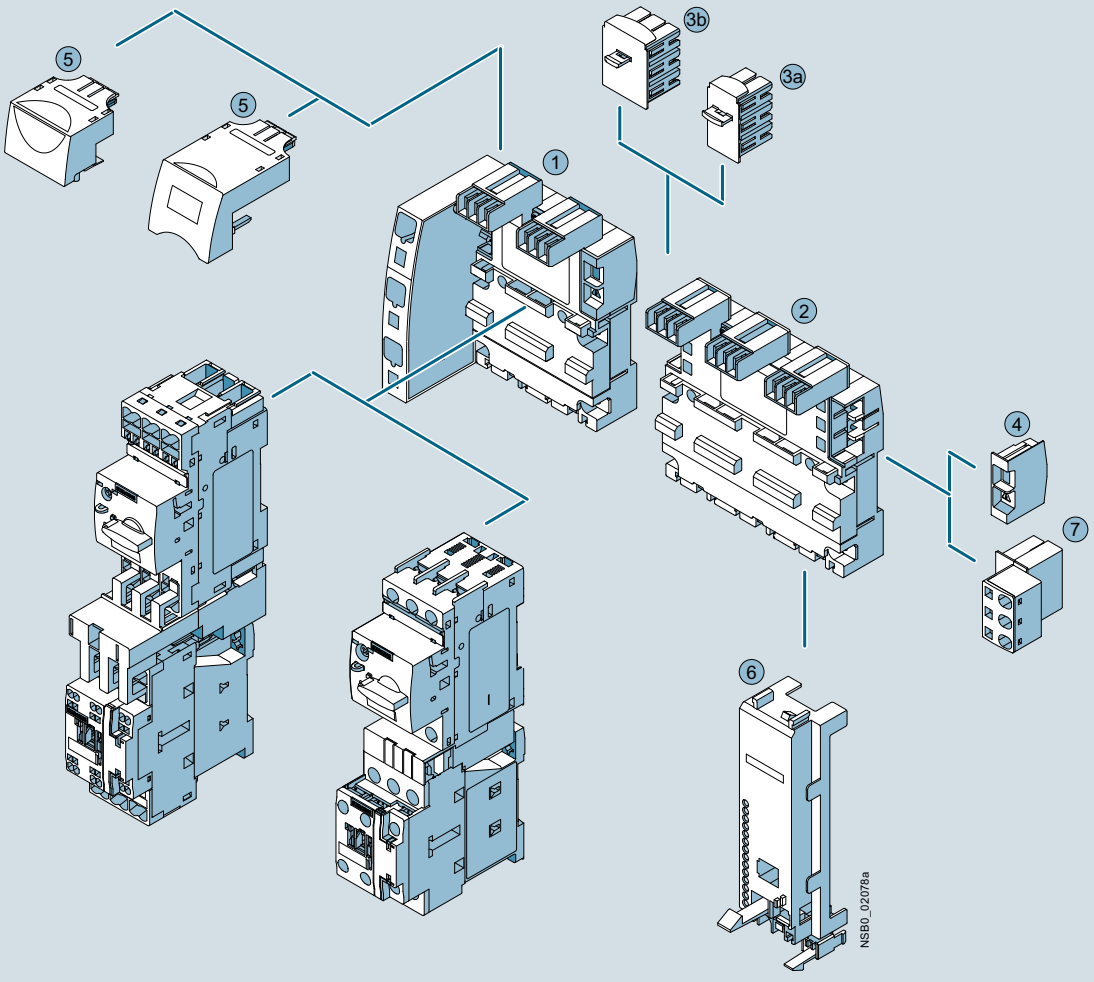
The system is based on a basic module complete with a lateral incoming unit (three-phase busbar with infeed). This infeed with spring-type terminals is mounted on the right or left depending on the version and can be supplied with a maximum conductor cross-section of 25 mm^2 (with end sleeve). A basic module has two sockets onto each of which a motor starter protector can be snapped.

Expansion modules are available for extending the system (three-phase busbars for system expansion). The individual modules are connected through an expansion plug.

The electrical connection between the three-phase busbars and the motor starter protectors is implemented through plug-in connectors. The complete system can be mounted on a TH 35 standard mounting rail to IEC 60715 and can be expanded as required up to a maximum current carrying capacity of 63 A.

The system is mounted extremely quickly and easily thanks to the simple plug-in technique. Thanks to the lateral infeed, the system also saves space in the control cabinet. The additional overall height required for the infeed unit is only 30 mm. The alternative infeed possibilities on each side offer a high degree of flexibility for configuring the control cabinet: Infeed on left-hand or right-hand side as well as infeed on one side and outfeed on the other side to supply further loads are all possible. A terminal block with spring-type connections in combination with a standard mounting rail enables the integration of not only SIRIUS motor starter protectors but also single-phase, 2-phase and 3-phase components such as 5SY miniature circuit breakers or SIRIUS relay components.

The 3RV29 infeed system is approved in accordance with IEC to 500 V. It is also UL-approved and authorized for "Self-Protected Combination Motor Controller" (Type E starter) as well as for Type F starter (Type E starter + contactor).



1 3-phase busbar with infeed
2 3-phase busbar for system expansion
3a Expansion plug
3b Extra-wide expansion plug
4 End cover
5 Plug-in connector
6 Contactor base
7 Terminal block

SIRIUS 3RV29 infeed systems

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① *Three-phase busbars with infeed*

A three-phase busbar with infeed unit is required for connecting the incoming supply. These modules comprise one infeed module and two sockets which each accept one motor starter protector. A choice of two versions with infeed on the left or right is available. The infeed is connected to spring-type terminals. They permit an infeed with conductor cross-sections of up to 25 mm^2 with end sleeves. An end cover is supplied with each module.

② *Three-phase busbars for system expansion*

The three-phase busbars for system expansion support expansion of the system. There is a choice of modules with two or three sockets. The system can be expanded as required up to a maximum current carrying capacity of 63 A. An expansion plug is supplied with each module.

③a *Expansion plug*

The expansion plug is used for electrical connection of adjacent three-phase busbars. The current carrying capacity of this plug equals 63 A. One expansion plug is supplied with each three-phase busbar for system expansion. Additional expansion plugs are therefore only required as spare parts.

③b *Extra-wide expansion plug*

The wide expansion plug makes the electrical connection between two three-phase busbars, thus performing the same function as the 3RV2917-5BA00 expansion plug; the electrical characteristics (e.g. a current carrying capacity of 63 A) are identical.

The 3RV2917-5E expansion plug is 10 mm wider than the 3RV2917-5BA00 expansion plug, hence in the plugged state there is a distance of 10 mm between the connected three-phase busbars. This distance can be used to lay the auxiliary current and control current wiring ("wiring duct"). The motor starter protector and contactor can be wired from underneath, which means that the complete cable duct above the system can be omitted.

④ *End cover*

The end cover is used to cover the three-phase busbar at the open end of the system. This cover is therefore only required once for each system. An end cover is supplied with each three-phase busbar system with infeed. Further end covers are therefore only required as spare parts.

⑤ *Plug-in connector*

The plug-in connector is used for the electrical connection between the three-phase busbar and the 3RV2 motor starter protector. These plug-in connectors are available for screw or spring-type terminals.

⑥ *Contactor base*

Load feeders can be assembled in the system using the S00 and S0 contactor base. The contactor bases are suitable for contactors sizes S00 and S0 with spring-type and screw terminals and are simply snapped onto the three-phase busbars. Direct-on-line starters and reversing starters are possible. One contactor base is required for direct-on-line starters and two are required for reversing starters.

To assemble load feeders for reversing starters, the contactor bases can be arranged alongside each other (90 mm overall width). In this case the mechanical interlocking of the contactors is possible. The S0 contactor bases are also suitable for soft starters size S00 and S0 with screw terminal.

The infeed system is designed for mounting onto a TH 35 standard mounting rail with 7.5 mm overall depth. This standard mounting rail gives the contactor base a stable mounting surface to sit on. If standard mounting rails with a depth of 15 mm are used, the spacer connected to the bottom of the contactor base must be knocked out and plugged into the mating piece that is also on the underside. Then the contactor base also has a stable mounting surface. When standard mounting rails with a depth of 7.5 mm are used, the spacer has no function and can be removed.

The link modules are used for direct start load feeders, in which case the use of a contactor base is not absolutely necessary. Motor starter protector and contactor assemblies can then be directly snapped onto the sockets of the three-phase busbars. For feeders of sizes S00 and S0, the corresponding 3RA1921-1...., 3RA2911-2...., 3RA2921-1.... or 3RA2921-2.... link modules should generally be used.

⑦ *Terminal block*

The 3RV2917-5D terminal block enables the integration of not only SIRIUS motor starter protectors but also single-phase, 2-phase and 3-phase components. The three phases can be fed out of the system using the terminal block; which means that single-phase loads can also be integrated in the system. The terminal block is plugged into the slot of the expansion plug and thus enables outfeeding from the middle or end of the infeed system. The terminal block can be rotated through 180° and be locked to the support modules of the infeed system. In addition, the 45 mm wide TH 35 3RV1917-7B standard mounting rail option for screwing onto the support plate facilitates plugging the single-phase, two-phase and three-phase components onto the infeed system.

Technical specifications

General data

Type					**3RV29.7**
Size					S00, S0
Standards					
• IEC 60947-2					Yes
• IEC 60947-4-1					Yes
• UL 508/UL 60947-4-1					Yes
Rated current I_n				A	63
Permissible rated current at inside temperature of control cabinet					
Motor starter protectors	Size	Rated current	Inside temperature of control cabinet		
• 3RV2.11	S00	... 14 A	60 °C	%	100
		>14 ... 16 A	40 °C	%	100
			60 °C	%	87
• 3RV2.21	S0	... 16 A	60 °C	%	100
		> 16 ... 25 A	40 °C	%	100
			60 °C	%	87
		> 25 ... 32 A	40 °C	%	87
Permissible ambient temperature					
• Storage/transport				°C	–50 ... +80
• Operation				°C	–20 ... +60
Rated operational voltage U_e					
• Acc. to IEC		10 % overvoltage		V AC	500
		5% overvoltage		V AC	525
• Acc. to UL/CSA				V AC	600
Rated frequency				Hz	50/60
Rated impulse withstand voltage U_{imp}				kV	6
Short-circuit strength					Corresponds to the mounted motor starter protector or load feeder
Degree of protection acc. to IEC 60529					IP20 (In the terminal compartment of the infeed without connected IP00 conductor)
Touch protection acc. to DIN VDE 0106, Part 100					Finger-safe

Conductor cross-sections

Type		**Three-phase busbar with infeed 3RV2917-1A, 3RV2917-1E**	**Terminal block 3RV2917-5D**
Conductor cross-sections (min./max.)			
• Solid or stranded	mm^2	4 ... 25	1.5 ... 6
• Finely stranded with end sleeve	mm^2	4 ... 25	1.5 ... 4
• Finely stranded without end sleeve	mm^2	6 ... 25	1.5 ... 6
• AWG cables	AWG	10 ... 3	15 ... 10

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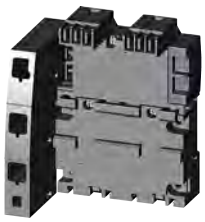
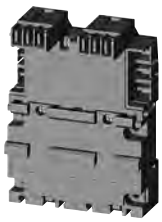
Selection and ordering data

Type	Version	For 3RV20, 3RV23, 3RV24 motor starter protectors Size	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Three-phase busbars with infeed								
 3RV2917-1A	**Three-phase busbars with infeed** incl. 3RV2917-6A end cover	For 2 motor starter protectors with screw or spring-type terminals						
	• With infeed on the left	S00, S0	A	**3RV2917-1A**		1	1 unit	41E
	• With infeed on the right	S00, S0	A	**3RV2917-1E**		1	1 unit	41E
Three-phase busbars for system expansion								
 3RV2917-4A	**Three-phase busbars** incl. 3RV2917-5BA00 expansion plug	For motor starter protectors with screw or spring-type terminals						
	• For 2 motor starter protectors	S00, S0	A	**3RV2917-4A**		1	1 unit	41E
	• For 3 motor starter protectors	S00, S0	A	**3RV2917-4B**		1	1 unit	41E
Plug-in connectors								
 3RV2917-5AA00	**Plug-in connectors** to make contact with the motor starter protectors	• For spring-type terminals		**Spring-type terminals**				
	- Single-unit packaging	S00[1] S0[2]	A A	**3RV2917-5AA00** **3RV2927-5AA00**		1 1	1 unit 1 unit	41E 41E
	- Multi-unit packaging	S00[1] S0[2]	A A	**3RV2917-5A** **3RV2927-5A**		1 1	10 units 10 units	41E 41E
 3RV2917-5CA00	• For screw terminals			**Screw terminals**				
	- Single-unit packaging	S00[1] S0[2]	A A	**3RV2917-5CA00** **3RV1927-5AA00**		1 1	1 unit 1 unit	41E 41E
	- Multi-unit packaging	S00[1] S0[2]	A A	**3RV2917-5C** **3RV1927-5A**		1 1	10 units 10 units	41E 41E

[1] I > 14 A, please note derating; see Manual "SIRIUS Innovations – SIRIUS 3RV2 Motor Starter Protectors",

[2] I > 16 A, please note derating; see Manual "SIRIUS Innovations – SIRIUS 3RV2 Motor Starter Protectors",

Type	Version	For contactors Size	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Contactor bases								
 3RV2927-7AA00	**Contactor bases** for mounting direct-on-line or reversing starters	Single-unit packaging						
		S00	A	**3RV2917-7AA00**		1	1 unit	41E
		S00, S0	A	**3RV2927-7AA00**		1	1 unit	41E

3RV29 infeed system

	Type	Version	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Terminal blocks								
 3RV2917-5D	**Terminal blocks** For integration of single-phase, two-phase and three-phase components	Single-unit packaging	A	**3RV2917-5D**		1	1 unit	41E
TH 35 standard mounting rails, width 45 mm								
 3RV1917-7B	**TH 35 standard mounting rails** acc. to IEC 60715, width 45 mm For mounting onto three-phase busbars	Single-unit packaging	A	**3RV1917-7B**		1	1 unit	41E
Extra-wide expansion plugs								
 3RV2917-5E	**Extra-wide expansion plugs** As accessory	Single-unit packaging	A	**3RV2917-5E**		1	1 unit	41E
Expansion plugs								
 3RV2917-5BA00	**Expansion plugs**[1] As spare part	Single-unit packaging	A	**3RV2917-5BA00**		1	1 unit	41E
End covers								
 3RV2917-6A	**End covers**[2] As spare part	Multi-unit packaging	A	**3RV2917-6A**		100	10 units	41E

[1] The expansion plug is included in the scope of supply of the 3RV2917-4. three-phase busbars for system expansion.

[2] The end cover is included in the scope of supply of the 3RV2917-1. three-phase busbars with infeed system.

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Overview

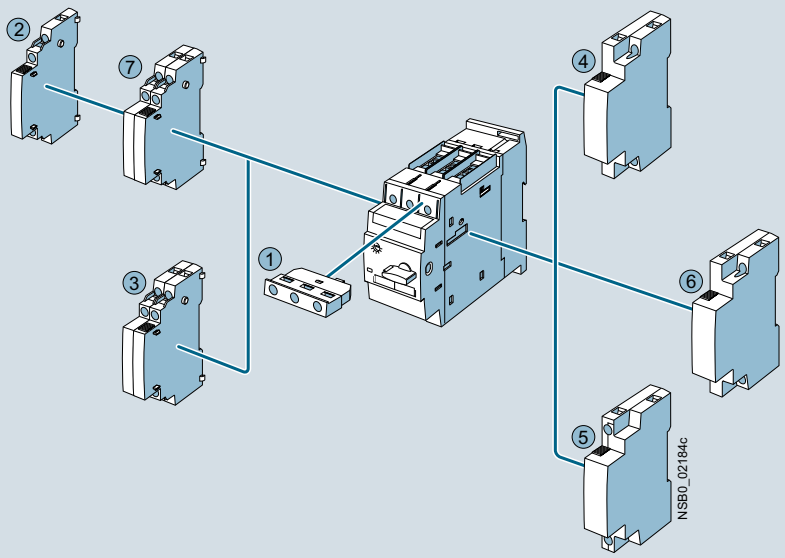
The following illustration shows our 3RV1 motor starter protector/ circuit breaker with the accessories which can be mounted for size S3, see also "Introduction" → "Overview", page 7/3.

"Accessories", see page 7/69 onwards.

Note:

The 3RV1 devices (sizes S00/S0 to S3) can be found

- in the Catalog Add-On IC 10 AO · 2015 at the Information and Download Center
- in the interactive catalog CA 01
- in the Industry Mall



Mountable accessories for size S3

1. Transverse auxiliary switch (can not be used with 3RV1742 circuit breakers)
2. Lateral auxiliary switch with 2 contacts
3. Lateral auxiliary switch with 4 contacts
4. Shunt release (can not be used with 3RV11 motor starter protectors)
5. Undervoltage release (can not be used with 3RV11 motor starter protectors)
6. Undervoltage release with leading auxiliary contacts (can not be used with 3RV11 motor starter protectors)
7. Alarm switch (can not be used with 3RV1742 circuit breakers)

SIRIUS 3RV1 motor starter protector/circuit breaker size S3 with mountable accessories

SIRIUS motor starter protector/circuit breaker size S3

3RV1 motor starter protectors/circuit breakers are compact, current limiting motor starter protectors/circuit breakers which are optimized for load feeders. The motor starter protectors/ circuit breakers are used according to IEC 60947-2 for switching and protecting three-phase motors of up to 45 kW at 400 V AC and for other loads with rated currents of up to 100 A.

3RV2 motor starter protectors/circuit breakers sizes S00 to S2 up to 80 A, see page 7/21 onwards.

3RV1 motor starter protectors/circuit breakers are generally approved according to IEC and UL/CSA.

According to UL 508/UL 60947-4-1, the 3RV1 motor starter protectors in size S3 are approved as:

- "Manual Motor Controllers"
- "Manual Motor Controllers" for "Group Installations"
- "Manual Motor Controllers Suitable for Tab Conductor Protection in Group Installations"
- "Self-Protected Combination Motor Controllers (Type E)" Please note that for this approval the 3RV10 motor starter protectors in size S3 must be equipped with additional infeed terminals.

The 3RV1742 are approved as circuit breakers according to UL 489; they are a special variant of the 3RV1 motor starter protectors.

Corresponding short-circuit values, see pages 7/54 to 7/57.

General data

Type of construction

The 3RV1 motor starter protectors/circuit breakers are available in four sizes:

- Size S00 – width 45 mm, max. rated current 12 A, at 400 V AC suitable for three-phase motors up to 5.5 kW
- Size S0 – width 45 mm, max. rated current 25 A, at 400 V AC suitable for three-phase motors up to 11 kW
- Size S2 – width 55 mm, max. rated current 50 A, at 400 V AC suitable for three-phase motors up to 22 kW
- Size S3 – width 70 mm, max. rated current 100 A, at 400 V AC suitable for three-phase motors up to 45 kW

Sizes S00 to S2 of the 3RV2 motor starter protectors/ circuit breakers up to 80 A, see page 7/21 onwards.

Circuit breakers acc. to UL 489

The 3RV1742 circuit breakers are available in size S3 (width 70 mm):

- Maximum rated current 70 A at 480 Y/277 V AC
- Maximum rated current 10 A to 30 A at 480 V AC

For sizes S00 and S0 of the 3RV27 and 3RV28 circuit breakers up to 22 A, see pages 7/29 and 7/30.

Connection methods

The SIRIUS 3RV1 motor starter protectors/circuit breakers can be supplied with screw terminals and spring-type terminals.

Screw terminals

Spring-type terminals

The terminals are indicated in the corresponding tables by the symbols shown on orange backgrounds.

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

3RV10 motor starter protectors are suitable for the overload protection of explosion-proof motors with "increased safety" type of protection EEx e.

Article No. scheme

Digit of the Article No.	1st - 3rd	4th	5th	6th	7th		8th	9th	10th	11th	12th		13th	14th	15th	16th
	□□□	□	□	□	□	–	□	□	□	□	□	–	□	□	□	□
Motor starter protectors/ circuit breakers	**3 R V**															
SIRIUS 1st generation		**1**														
Type of motor starter protector/ circuit breaker			□													
Size				□												
Breaking capacity					□											
Setting range for overload release							□	□								
Trip class (CLASS)									□							
Connection methods										□						
With or without auxiliary switch											□					
Special versions													□	□	□	□
Example	**3 R V**	**1**	**0**	**4**	**1**	**–**	**4**	**F**	**A**	**1**	**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.

Application

Operating conditions

3RV1 motor starter protectors/circuit breakers are suitable for use in any climate. They are intended for use in enclosed rooms in which no severe operating conditions (such as dust, caustic vapors, hazardous gases) prevail. When installed in dusty and damp areas, suitable enclosures must be provided.

3RV1 motor starter protectors/circuit breakers can optionally be fed from the top or from below.

3RV1 motor starter protectors/circuit breakers are suitable for operation in IT systems (IT networks). In this case, the different short-circuit breaking capacity in the IT system must be taken into account, see page 7/55.

Since operational currents, starting currents and current peaks are different even for motors with identical power ratings due to the inrush current, the motor ratings in the selection tables are only guide values. The specific rated and startup data of the motor to be protected is always paramount to the choice of the most suitable motor starter protector/circuit breaker. This also applies to motor starter protectors for transformer protection.

Possible uses

The 3RV1 motor starter protectors/circuit breakers can be used:

- For short-circuit protection
- For motor protection (also with overload relay function)
- For system protection
- For short-circuit protection for starter combinations
- As main and EMERGENCY-STOP switches
- For fuse monitoring
- For operation in IT systems (IT networks)
- For switching of DC currents
- As voltage transformer circuit breakers
- In areas subject to explosion hazard (ATEX)
- Approved as circuit breakers according to UL 489 (3RV1742)

More information, see page 3.

Technical specifications

Short-circuit breaking capacity I_{cu}, I_{cs} according to IEC 60947-2

This table shows the rated ultimate short-circuit breaking capacity I_{cu} and the rated service short-circuit breaking capacity I_{cs} of the 3RV1 motor starter protectors/circuit breakers with different operating voltages dependent of the rated current I_n of the motor starter protectors/circuit breakers.

Power can be supplied to the motor starter protectors/circuit breakers via the terminals at the top or at the bottom without restricting the rated data. If the short-circuit current at the place of installation exceeds the rated short-circuit breaking capacity of the motor starter protector/circuit breaker as specified in the table, a back-up fuse is required. It is also possible to install an upstream motor starter protector/circuit breaker with a limiter function.

The maximum rated current of this back-up fuse is indicated in the tables. The rated ultimate short-circuit breaking capacity then applies as specified on the fuse.

Fuseless design

Motor starter protector/contactor assemblies for short-circuit currents up to 100 kA can be ordered as fuseless load feeders, see Chapter 8 "Load Feeders and Motor Starters for Use in the Control Cabinet".

Motor starter protectors/ circuit breakers	Rated current I_n	Up to 240 V AC[1]			Up to 400 V AC[1]/ 415 V AC[2]			Up to 440 V AC[1]/ 460 V AC[2]			Up to 500 V AC[1]/ 525 V AC[2]			Up to 690 V AC[1]		
		(these values do not apply to 3RV1742 circuit breakers)														
		I_{cu}	I_{cs}	Max. fuse (gG)	I_{cu}	I_{cs}	Max. fuse (gG)[3]	I_{cu}	I_{cs}	Max. fuse (gG)[3]	I_{cu}	I_{cs}	Max. fuse (gG)[3]	I_{cu}	I_{cs}	Max. fuse (gG)[3][4]
Type	A	kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A
Size S00																
3RV1611-0BD10	0.2	100	100	°	100	100	°	100	100	°	100	100	°	100	100	°
Size S3																
3RV1.41	40	100	100	°	50	25	125	50	20	125	12	6	100	6	3	63
	50	100	100	°	50	25	125	50	20	125	12	6	100	6	3	80
	63	100	100	°	50	25	160	50	20	160	12	6	100	6	3	80
	75	100	100	°	50	25	160	50	20	160	8	4	125	5	3	100
	90; 100	100	100	°	50	25	160	50	20	160	8	4	125	5	3	125
Size S3, with increased switching capacity																
3RV1.42/3RV1742[5]	16 / 10	100	100	°	100	50	°	100	50	°	30	15	80	12	7	63
	20 / 15	100	100	°	100	50	°	100	50	°	30	15	80	12	7	63
	25 / 20	100	100	°	100	50	°	100	50	°	30	15	80	12	7	63
	32 / 25	100	100	°	100	50	°	100	50	°	22	11	100	12	7	63
	40 / 30	100	100	°	100	50	°	100	50	°	18	9	160	12	6	80
	50 / 35 ... 40	100	100	°	100	50	°	100	50	°	15	7.5	160	10	5	100
	63 / 45 ... 50	100	100	°	100	50	°	70	50	200	15	7.5	160	7.5	4	100
	75 / 60	100	100	°	100	50	°	70	50	200	10	5	160	6	3	125
	90 / 70	100	100	°	100	50	°	70	50	200	10	5	160	6	3	160
	100 / --	100	100	°	100	50	°	70	50	200	10	5	160	6	3	160

° No back-up fuse required, since short-circuit resistant up to 100 kA

1) 10 % overvoltage.

2) 5 % overvoltage.

3) Back-up fuse only required if short-circuit current at the place of installation > I_{cu}.

4) Alternatively, fuseless limiter combinations for 690 V AC can also be used.

5) The values for the 3RV1742 circuit breakers have been tested only up to 400 V/415 V AC; values > 440 V AC on request.

Short-circuit breaking capacity I_{cuIT} in the IT system (IT network) according to IEC 60947-2

3RV1 motor starter protectors/circuit breakers are suitable for operation in IT systems. The values of I_{cu} and I_{cs} apply for the three-pole short circuit. In case of a double ground fault in different phases at the input and output side of a motor starter protector/circuit breaker, the special short-circuit breaking capacity I_{cuIT} applies. The specifications in the table apply to 3RV1 motor starter protectors/circuit breakers.

If the short-circuit current at the place of installation exceeds the motor starter protector/circuit breaker's specified rated short-circuit breaking capacity, you will need to use a back-up fuse. The maximum rated current of this back-up fuse is indicated in the tables. The rated short-circuit breaking capacity then applies as specified on the fuse.

Motor starter protectors/ circuit breakers	Rated current I_n	Up to 240 V AC[1]		Up to 400 V AC[1]/415 V AC[2]		Up to 500 V AC[1]/525 V AC[2]		Up to 690 V AC[1][5]	
		I_{cuIT}	Max. fuse (gG)[3]	I_{cuIT}	Max. fuse (gG)[3][4]	I_{cuIT}	Max. fuse (gG)[3]	I_{cuIT}	Max. fuse (gG)[3]
Type	A	kA	A	kA	A	kA	A	kA	A
Size S00									
3RV1611-0BD10	0.2	100	°	100	°	100	°	100	°
Size S3									
3RV1.41	40	50	125	10	63	5	50	5	50
	50	50	125	8	80	3	63	3	63
	63	50	160	6	80	3	63	3	63
	75	50	160	5	100	2	80	2	80
	90; 100	50	160	5	125	2	100	2	100
Size S3, with increased switching capacity									
3RV1.42	16 ... 32	100	°	12	63	6	50	6	50
	40	100	°	12	80	6	63	6	63
	50	100	°	10	100	4	80	4	80
	63	100	°	7.5	100	4	80	4	80
	75	100	°	6	125	3	100	3	100
	90; 100	100	°	6	160	3	125	3	125

° No back-up fuse required, since short-circuit resistant up to 100 kA

1) 10 % overvoltage.

2) 5 % overvoltage.

3) Back-up fuse only required if short-circuit current at the place of installation > I_{cuIT}.

4) Alternatively, fuseless limiter combinations for 690 V AC can also be used.

5) Overvoltage category II applies for applications in IT systems > 600 V.

Limiter function with standard devices for 500 V AC and 690 V AC according to IEC 60947-2

The table shows the rated ultimate short-circuit breaking capacity I_{cu} and the rated service short-circuit breaking capacity I_{cs} with an upstream standard motor starter protector that fulfills the limiter function at voltages 500 V AC and 690 V AC.

The short-circuit breaking capacity can be increased significantly with an upstream standard motor starter protector with limiter function. The motor starter protector which is connected downstream must be set to the rated current of the load.

With motor starter protector assemblies, note the clearance to grounded parts and between the motor starter protectors. Short-circuit proof wiring between the motor starter protectors must be ensured. The motor starter protectors can be mounted side by side in a modular arrangement.

Standard motor starter protectors		Rated current I_n	Up to 500 V AC[1]/525 V AC[2]		Up to 690 V AC[1]	
	With limiter rated current I_n		I_{cu}	I_{cs}	I_{cu}	I_{cs}
Type	Type	A	kA	kA	kA	kA
Size S3						
3RV1041/3RV10 42	**3RV1341-4HC10** I_n = 50 A	32 ... 50	100	50	50	25
	3RV1341-4MC10 I_n = 100 A	50 ... 100	100	50	50	25

1) 10 % overvoltage.

2) 5 % overvoltage.

General data

Permissible rated data of approved devices for North America (UL/CSA)

Motor starter protectors/circuit breakers of the 3RV1 series are approved for UL/CSA, and according to UL508/UL 60947-4-1 and CSA C22.2 No. 14/CSA 60947-4-1 they can be used on their own or as load feeders in combination with a contactor.

These motor starter protectors/circuit breakers can be used as "Manual Motor Controllers" for "Group Installations", as "Manual Motor Controllers Suitable for Tap Conductor Protection in Group Installations" and as "Self-Protected Combination Motor Controllers" (Type E).

3RV1 motor starter protectors/circuit breakers as "Manual Motor Controllers"

If used as a "Manual Motor Controller", the motor starter protector/circuit breaker is always operated in combination with an upstream short-circuit protection device. Approved fuses or a circuit breaker according to UL 489/CSA C22.2 No. 5 can be used. These devices must be dimensioned according to the National Electrical Code (UL) or Canadian Electrical Code (CSA).

The file numbers for the approval of the 3RV1 as a Manual Motor Controller are as follows:

- UL File No. 47705, CCN: NLRV
- CSA Master Contract 165071, Product Class: 3211 05

Motor starter protectors		**hp rating[1] for FLA[2] max.**		**Rated current I_n**	**240 V AC**		**480 V AC**		**600 V AC**	
					UL I_{bc}[3]	CSA I_{bc}[3]	UL I_{bc}[3]	CSA I_{bc}[3]	UL I_{bc}[3]	CSA I_{bc}[3]
Type	V	Single-phase	3-phase	A	kA	kA	kA	kA	kA	kA
Size S00										
3RV1611-0BD10				0.2	65	65	65	65	10	10
Size S3										
3RV1041/3RV1042, 3RV1142, 3RV1341/3RV1342				16 ... 75 90; 100	65 65	65 65	65 65	65 65	30 10	30 10
FLA[2] max. 100 A, 600 V NEMA size 3	115 200 230 460 575/600	7 1/2 20 20 -- --	-- 30 40 75 100							

[1] hp rating = Power rating in horse power (maximum motor rating).

[2] FLA = Full Load Amps/motor full load current.

[3] Corresponds to "short-circuit breaking capacity" according to UL/CSA.

3RV10 motor starter protectors as "Manual Motor Controllers Suitable for Tap Conductor Protection in Group Installations"

The application as "Manual Motor Controllers Suitable for Tap Conductor Protection in Group Installations" is only available for UL. CSA does not recognize this approval! When the motor starter protector is used as a "Manual Motor Controller Suitable for Tap Conductor Protection in Group Installations", it must always be combined with upstream short-circuit protection. Approved fuses or a circuit breaker according to UL 489 can be used. These devices must be dimensioned according to the National Electrical Code.

The 3RV10 motor starter protectors are approved as "Manual Motor Controllers Suitable for Tap Conductor Protection in Group Installations" under the following file number:

- UL File No. 47705, CCN: NLRV

Motor starter protectors		**hp rating[1] for FLA[2] max.**		**Rated current I_n**	**240 V AC**	**Up to 480 Y/277 V AC**	**Up to 600 Y/347 V AC**
					UL I_{bc}[3]	UL I_{bc}[3]	UL I_{bc}[3]
Type	V	Single-phase	3-phase	A	kA	kA	kA
Size S3							
3RV104.				16 ... 75 90; 100	65 65	65 65	30 --
FLA[2] max. 100 A, 480 V 75 A, 600 V NEMA size 3	115 200 230 460 575/600	7 1/2 20 20 -- --	-- 30 40 75 75				

-- No approval

[1] hp rating = Power rating in horse power (maximum motor rating).

[2] FLA = Full Load Amps/motor full load current.

[3] Corresponds to "short-circuit breaking capacity" according to UL.

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3RV10 motor starter protectors as "Self-Protected Combination Motor Controllers (Type E)"

UL 508/UL 60947-4-1 approval demands 1-inch clearance and 2-inch creepage distance at line side for "Self-Protected Combination Motor Controller Type E".

Therefore, 3RV10 motor starter protectors in size S3 are approved according to UL 508/UL 60947-4-1 in combination with the 3RT1946-4GA07 terminal block listed below.

CSA does not require these extended clearances and creepage distances. According to CSA, these terminal blocks can be omitted when the device is used as a "Self-Protected Combination Motor Controller".

The 3RV10 motor starter protectors are approved as "Self-Protected Combination Motor Controllers" under the following file numbers:

- UL File No. E156943, CCN: NKJH
- CSA Master Contract 165071, Product Class: 3211 08

Motor starter protectors		**hp rating[1] for FLA[2] max.**		**Rated current I_n**	**Up to 240 V AC**		**Up to 480 Y/277 V AC**		**Up to 600 Y/347 V AC**	
					UL I_{bc}[3]	CSA I_{bc}[3]	UL I_{bc}[3]	CSA I_{bc}[3]	UL I_{bc}[3]	CSA I_{bc}[3]
Type	V	Single-phase	Three-phase	A	kA	kA	kA	kA	kA	kA
Size S3										
3RV1041 + 3RT1946-4GA07[4]				16 ... 75	65	65	65	65	30	30
				90; 100	65	65	65	65	--	--
FLA[2] max.	115	10	--							
100 A, 480 V	200	20	30							
75 A, 600 V	230	20	40							
	460	--	75							
NEMA size 3	575/600	--	75							

-- No approval

1) hp rating = Power rating in horse power (maximum motor rating).

2) FLA = Full Load Amps/motor full load current.

3) Corresponds to "short-circuit breaking capacity" according to UL/CSA.

4) Not required for CSA.

3RV1742 motor starter protectors as "Circuit Breakers"

These motor starter protectors are approved as circuit breakers according to UL 489 and CSA 22.2 No. 5. They can be used therefore as upstream short-circuit protective devices for "Manual Motor Controllers" and "Manual Motor Controllers Suitable for Tap Conductor Protection in Group Installations".

The 3RV1742 motor starter protectors are approved as "Circuit Breakers" under the following file numbers:

- UL File No. E235044, CCN: DIVQ
- CSA Master Contract 165071, Product Class: 1432 01

Circuit breakers	**Rated current I_n**	**240 V AC**		**480 Y/277 V AC**		**480 V AC**		**600 Y/347 V AC**	
		UL I_{bc}[1]	CSA I_{bc}[1]	UL I_{bc}[1]	CSA I_{bc}[1]	UL I_{bc}[1]	CSA I_{bc}[1]	UL I_{bc}[1]	CSA I_{bc}[1]
Type	A	kA	kA	kA	kA	kA	kA	kA	kA
Size S3									
3RV1742	10 ... 30	65	65	65	65	65	65	20	20
	35 ... 60	65	65	65	65	--	--	20	20
	70	65	65	65	65	--	--	10	10

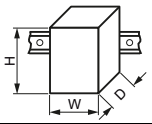
-- No approval

1) Corresponds to "short-circuit breaking capacity" according to UL.

7

General data

General data

Type			**3RV1611**[1]	**3RV1.4.**	**3RV1742**
Size			S00	S3	S3
Dimensions (W x H x D)		mm	45 x 90 x 70	70 x 165 x 169	70 x 168 x 169
Standards					
• IEC 60947-1, EN 60947-1 (VDE 0660 Part 100)			Yes		
• IEC 60947-2, EN 60947-2 (VDE 0660 Part 101)			Yes		
• IEC 60947-4-1, EN 60947-4-1 (VDE 0660 Part 102)			Yes		No
• UL 508/UL 60947-4-1, CSA C22.2 No.14/CSA 60947-4-1			Yes		No
• UL 489, CSA C22.2 No. 5			No		Yes
Number of poles			3		
Max. rated current $I_{n\ max}$ (= max. rated operational current I_e)		A	12	100	70
Permissible ambient temperature					
• Storage/transport		°C	–50 ... +80		
• Operation		°C	–20 ... +70 (current reduction above +60 °C)		
Permissible rated current at inside temperature of control cabinet					
• +60 °C		%	100		
• +70 °C		%	87		
Permissible rated current at ambient temperature of enclosure (applies for motor starter protector inside enclosure)					
• +35 °C		%	100		
• +60 °C		%	87		
Rated operational voltage U_e					
• Acc. to IEC		V AC	690 (with molded-plastic enclosure 500 V)		
• Acc. to UL/CSA		V AC	600		
Rated frequency		Hz	50/60		
Rated insulation voltage U_i		V	690		
Rated impulse withstand voltage U_{imp}		kV	6		
Utilization category					
• IEC 60947-2 (motor starter protector/circuit breaker)			A		
• IEC 60947-4-1 (motor starter)			AC-3		--
Trip class CLASS	Acc. to IEC 60947-4-1		10	10/20	--
DC short-circuit breaking capacity (time constant t = 5 ms)					
• 1 conducting path 150 V DC		kA	10		
• 2 conducting paths in series 300 V DC		kA	10		
• 3 conducting paths in series 450 V DC		kA	10		
Power loss P_v for each motor starter protector/circuit breaker Dependent on the rated current I_n (upper setting range) $R_{\text{per conducting path}} = \frac{P}{I^2 \times 3}$	I_n: 16 ... 63 A	W	--	20	
	I_n: 75 and 90 A	W	--	30	
	I_n: 100 A	W	--	38	
	I_n: 10 A	W	--		8
	I_n: 15 ... 35 A	W	--		12
	I_n: 40 ... 70 A	W	--		21
Shock resistance	Acc. to IEC 60068-2-27	g/ms	25/11 (square and sine pulse)		
Degree of protection	Acc. to IEC 60529		IP20 (IP00 terminal compartment)		
Touch protection	Acc. to EN 50274		Finger-safe for vertical contact from the front		
Temperature compensation	Acc. to IEC 60947-4-1	°C	–20 ... +60		
Phase failure sensitivity	Acc. to IEC 60947-4-1		Yes (does not apply for 3RV134 motor starter protectors)		No
Explosion protection – Safe operation of motors with "increased safety" type of protection EC type test certificate number according to directive 94/9/EC (ATEX)			Yes, for 3RV10 (CLASS 10) DMT 02 ATEX F 001 Ex II (2) GD, DMT 02 ATEX F 001 N1 Ex II (2) GD		No
Isolating function	Acc. to IEC 60947-2		Yes		
Main and EMERGENCY-STOP switch characteristics (with corresponding accessories)	Acc. to DIN EN 60204-1		Yes		
Protective separation between main and auxiliary circuits, required for PELV applications	Acc. to IEC 60947-1				
• Up to 400 V +10 %			Yes		
• Up to 415 V +5 % (higher voltages on request)			Yes		
Permissible mounting position			Any, acc. to IEC 60447 start command "I" right-hand side or top		
Mechanical endurance		Operating cycles	100 000	50 000	
Electrical endurance		Operating cycles	100 000	25 000	
Max. switching frequency per hour (motor starts)		1/h	15		

[1] "Technical Specifications" for 3RV1611 voltage transformer circuit breakers, see page 7/60.

Conductor cross-sections of main circuit

Type		3RV1611[4]	3RV1.4./ 3RV1742
Connection type		Screw terminals	Screw terminals with box terminal
Terminal screw		Pozidriv size 2	4 mm Allen screw
Prescribed tightening torque	Nm	0.8 ... 1.2	4 ... 6
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected			
• Solid or stranded	mm^2	2 x (0.5 ... 1.5)[5], 2 x (0.75 ... 2.5)[5]	2 x (2.5 ... 16)[5], 2 x (10 ... 50)[5], 1 x (10 ... 70)[5]
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (0.5 ... 1.5)[5], 2 x (0.75 ... 2.5)[5]	2 x (2.5 ... 35)[5], 1 x (2.5 ... 50)[5]
• AWG cables, solid or stranded	AWG	2 x (18 ... 14)	2 x (10 ... 1/0)[5], 1 x (10 ... 2/0)[5]
Ribbon cable conductors (Number x Width x Thickness)	mm	--	2 x (6 x 9 x 0.8)
Removable box terminals[1]			
• With copper bars[2]		--	18 x 10
• With cable lugs[3]		--	up to 2 x 70

1) Cable lug and busbar connection possible after removing the box terminals.

2) If bars larger than 12 mm x 10 mm are connected, a 3RT1946-4EA1 cover is needed to comply with the phase clearance.

3) When connecting conductors which are larger than 25 mm^2, the 3RT1946-4EA1 cover must be used to keep the phase clearance.

4) "Technical Specifications" for 3RV16 voltage transformer circuit breakers, see page 7/60.

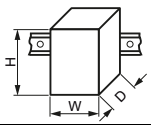
5) If two different conductor cross-sections are connected to one clamping point, both cross-sections must be in the range specified.

Rated data of the auxiliary switches and signaling switches

Type 3RV19		Lateral auxiliary switch with 1 NO + 1 NC, 2 NO, 2 NC, 2 NO + 2 NC; Signaling switches	Transverse auxiliary switches with 1 CO	1 NO + 1 NC, 2 NO
Max. Rated voltage				
• Acc. to NEMA (UL)	V AC	600		250
• Acc. to NEMA (CSA)	V AC	600		250
Uninterrupted current	A	10	5	2.5
Switching capacity		A600 Q300	B600 R300	C300 R300

General data

Voltage transformer circuit breakers

General data					
Type			**3RV1611-1AG14**	**3RV1611-1CG14**	**3RV1611-1DG14**
Size			S00	S00	S00
Dimensions (W x H x D)		mm	45 x 90 x 70	45 x 90 x 70	45 x 90 x 70
Rated current I_n		A	1.4	2.5	3
Ambient temperature					
• During storage/transport		°C	–50 ... +80		
• During operation		°C	–20 ... +60 (up to +70°C is possible with current reduction)		
Rated operational voltage U_e		V	400		
Rated frequency		Hz	16.66 ... 60		
Rated insulation voltage U_i		V	690		
Short-circuit breaking capacity I_{cu} at 400 V AC		kA	50		
Set value of the thermal overload release		A	1.4	2.5	3
Response value of the instantaneous overcurrent release		A	6 ± 20 %	10.5 ± 20 %	20 ± 20 %
Tripping time of the instantaneous overcurrent release		ms	Approx. 6 at 12 A	Approx. 6 at 20 A	Approx. 6 at 40 A
Internal resistance					
• In cold state		Ω	> 0.25 ± 6.5 %		
• In heated state		Ω	> 0.30 ± 6.5 %		
Shock resistance acc. to IEC 60068-2-27		*g*/ms	15		
Degree of protection acc. to IEC 60529			IP20		
Touch protection acc. to EN 50274			Finger-safe for vertical contact from the front		
Endurance					
• Mechanical		Operating cycles	10 000		
• Electrical		Operating cycles	10 000		
Permissible mounting position			Any		

Type			**3RV1611-1AG14**	**3RV1611-1CG14**	**3RV1611-1DG14**
Conductor cross-sections, main circuit, 1 or 2 conductors					
Connection type			**Screw terminals**		
Terminal screw			Pozidriv size 2		
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected					
• Solid or stranded		mm^2	2 x (0.5 ... 1.5)[1], 2 x (0.75 ... 2.5)[1], max. 4		
• Finely stranded with end sleeve (DIN 46228-1)		mm^2	2 x (0.5 ... 1.5)[1], 2 x (0.75 ... 2.5)[1]		
Auxiliary switches for blocking the distance protection					
With defined lateral assignment for blocking distance protection			1 CO (for use as 1 NO or 1 NC)		
Rated operational voltage U_e	Alternating voltage	V	125		
Rated operational current I_e/AC-14	at U_e = 125 V	A	0.1		
Rated operational voltage U_e	Direct voltage *L/R* 200 ms	V	60		
Rated operational current I_e/DC-13	at U_e = 60 V	A	0.3		
Minimum load capacity		V mA	5 1		
Short-circuit protection for auxiliary circuit					
Melting fuses operational class gG		A	10		
Miniature circuit breakers C characteristic		A	6 (prospective short-circuit current < 0.4 kA)		
Auxiliary switches for other signaling purposes					

For technical specifications, see the next page.

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

Mountable accessories

Front transverse auxiliary switches

			Switching capacity for different voltages	
			1 CO	**1 NO + 1 NC, 2 NO**
Rated operational current I_e				
• At AC-15, alternating voltage				
- 24 V		A	4	2
- 230 V		A	3	0.5
• At AC-12 = I_{th}, alternating voltage				
- 24 V		A	10	2.5
- 230 V		A	10	2.5
• At DC-13, direct voltage *L/R* 200 ms				
- 24 V		A	1	1
- 48 V		A	--	0.3
- 60 V		A	--	0.15
- 110 V		A	0.22	--
- 220 V		A	0.1	--
Minimum load capacity		V	17	
		mA	1	

Front transverse solid-state compatible auxiliary switches

			Switching capacity for different voltages
			1 CO
Rated operational voltage U_e	Alternating voltage	V	125
Rated operational current I_e/AC-14	at U_e = 125 V	A	0.1
Rated operational voltage U_e	Direct voltage *L/R* 200 ms	V	60
Rated operational current I_e/DC-13	at U_e = 60 V	A	0.3
Minimum load capacity		V	5
		mA	1

Lateral auxiliary switches with signaling switch

			Switching capacity for different voltages: Lateral auxiliary switch with 1 NO + 1 NC, 2 NO, 2 NC, 2 NO + 2 NC Signaling switch
Rated operational current I_e			
• At AC-15, alternating voltage			
- 24 V		A	6
- 230 V		A	4
- 400 V		A	3
- 690 V		A	1
• At AC-12 = I_{th}, alternating voltage			
- 24 V		A	10
- 230 V		A	10
- 400 V		A	10
- 690 V		A	10
• At DC, direct voltage *L/R* 200 ms			
- 24 V		A	2
- 110 V		A	0.5
- 220 V		A	0.25
- 440 V		A	0.1
Minimum load capacity		V	17
		mA	1

Auxiliary releases

			Undervoltage releases	Shunt releases
Power consumption				
• During pick-up				
- AC voltages		VA/W	20.2/13	20.2/13
- DC voltages		W	20	13 ... 80
• During uninterrupted duty				
- AC voltages		VA/W	7.2/2.4	--
- DC voltages		W	2.1	--
Response voltage				
• Tripping		V	0.35 ... 0.7 x U_s	0.7 ... 1.1 x U_s
• Pick-up		V	0.85 ... 1.1 x U_s	--
Opening time maximum		ms	20	

General data

Short-circuit protection for auxiliary and control circuits		
Melting fuses operational class gG	A	10
Miniature circuit breakers C characteristic	A	6 (prospective short-circuit current < 0.4 kA)

Conductor cross-sections for auxiliary and control circuits		
Connection type		**Screw terminals**
Terminal screw		Pozidriv size 2
Prescribed tightening torque	Nm	0.8 ... 1.2
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected		
• Solid or stranded	mm^2	2 x (0.5 ... 1.5)[1]/ 2 x (0.75 ... 2.5)[1]
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (0.5 ... 1.5)[1]/ 2 x (0.75 ... 2.5)[1]
• AWG cables	AWG	2 x (18 ... 14)
Connection type		**Spring-type terminals**[2)3)]
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected		
• Solid or stranded	mm^2	2 x (0.25 ... 2.5)
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (0.25 ... 1.5)
• Finely stranded without end sleeve	mm^2	2 x (0.25 ... 2.5)
• AWG cables, solid or stranded	AWG	2 x (24 ... 14)
Max. external diameter of the conductor insulation	mm	3.6

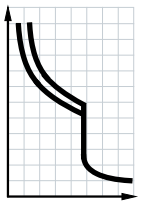
1) If two different conductor cross-sections are connected to one clamping point, both cross-sections must be in the range specified.

2) With conductor cross-sections ≤ 1 mm^2, an "insulation stop" must be used; see Chapter 3 "Controls – Contactors and Contactor Assemblies". → "Accessories".

3) Corresponding opening tool 3RA2908-1A, see "Accessories", page 7/76.

Selection and ordering data

CLASS 10, without auxiliary switches



Rated current	Suitable for three-phase motors[1] with *P*	Setting range for thermal overload release	Instantaneous overcurrent releases	Short-circuit breaking capacity at 400 V AC	DT	Screw terminals		PU (UNIT, SET, M)	PS*	PG
I_n			$I >$	I_{cu}		Article No.	Price per PU			
A	kW	A	A	kA						
Size S3										
40	18.5	28 ... 40	520	50	▶	**3RV1041-4FA10**		1	1 unit	41E
50	22	36 ... 50	650	50	▶	**3RV1041-4HA10**		1	1 unit	41E
63	30	45 ... 63	819	50	▶	**3RV1041-4JA10**		1	1 unit	41E
75[2]	37	57 ... 75	975	50	▶	**3RV1041-4KA10**		1	1 unit	41E
90[2]	45	70 ... 90	1 170	50	▶	**3RV1041-4LA10**		1	1 unit	41E
100[2]	45	80 ... 100	1 235	50	▶	**3RV1041-4MA10**		1	1 unit	41E

3RV1041-4LA10

Size S3, with increased switching capacity										
16	7.5	11 ... 16	208	100	▶	**3RV1042-4AA10**		1	1 unit	41E
20	7.5	14 ... 20	260	100	▶	**3RV1042-4BA10**		1	1 unit	41E
25	11	18 ... 25	325	100	▶	**3RV1042-4DA10**		1	1 unit	41E
32	15	22 ... 32	416	100	▶	**3RV1042-4EA10**		1	1 unit	41E
40	18.5	28 ... 40	520	100	▶	**3RV1042-4FA10**		1	1 unit	41E
50	22	36 ... 50	650	100	▶	**3RV1042-4HA10**		1	1 unit	41E
63	30	45 ... 63	819	100	▶	**3RV1042-4JA10**		1	1 unit	41E
75[2]	37	57 ... 75	975	100	▶	**3RV1042-4KA10**		1	1 unit	41E
90[2]	45	70 ... 90	1 170	100	▶	**3RV1042-4LA10**		1	1 unit	41E
100[2]	45	80 ... 100	1 235	100	▶	**3RV1042-4MA10**		1	1 unit	41E

3RV1042-4JA10

CLASS 20, without auxiliary switches

Size S3, with increased switching capacity										
40	18.5	28 ... 40	520	100	A	**3RV1042-4FB10**		1	1 unit	41E
50	22	36 ... 50	650	100	A	**3RV1042-4HB10**		1	1 unit	41E
63	30	45 ... 63	819	100	A	**3RV1042-4JB10**		1	1 unit	41E
75[2]	37	57 ... 75	975	100	A	**3RV1042-4KB10**		1	1 unit	41E
90[2]	45	70 ... 90	1 170	100	A	**3RV1042-4LB10**		1	1 unit	41E
100[2]	45	80 ... 100	1 235	100	A	**3RV1042-4MB10**		1	1 unit	41E

3RV1042-4KB10

[1] 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.

[2] For the use of 3RV104. motor starter protectors with an energy-efficient IE3 motor we recommend using a contactor for normal switching duty, see also page 7/53.

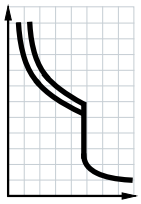
Auxiliary switches and other accessories can be ordered separately (see "Accessories" page 7/70 onwards).

Multi-unit/reusable packaging available on request.

For motor protection with overload relay function

Selection and ordering data

CLASS 10, with overload relay function (automatic RESET), without auxiliary switches



Rated current	Suitable for three-phase motors[1] with *P*	Setting range for thermal overload release	Instantaneous overcurrent release	Short-circuit breaking capacity at 400 V AC	DT	Screw terminals — Article No.	PU (UNIT, SET, M)	PS*	PG
I_n		⊏	$I >$	I_{cu}					
A	kW	A	A	kA					
Size S3, with increased switching capacity[2]									
16	7.5	11 ... 16	208	100	A	**3RV1142-4AA10**	1	1 unit	41E
20	7.5	14 ... 20	260	100	A	**3RV1142-4BA10**	1	1 unit	41E
25	11	18 ... 25	325	100	A	**3RV1142-4DA10**	1	1 unit	41E
32	15	22 ... 32	416	100	A	**3RV1142-4EA10**	1	1 unit	41E
40	18.5	28 ... 40	520	100	A	**3RV1142-4FA10**	1	1 unit	41E
50	22	36 ... 50	650	100	A	**3RV1142-4HA10**	1	1 unit	41E
63	30	45 ... 63	819	100	A	**3RV1142-4JA10**	1	1 unit	41E
75[3]	37	57 ... 75	975	100	A	**3RV1142-4KA10**	1	1 unit	41E
90[3]	45	70 ... 90	1 170	100	A	**3RV1142-4LA10**	1	1 unit	41E
100[3]	45	80 ... 100	1 235	100	A	**3RV1142-4MA10**	1	1 unit	41E

3RV1142-4AA10

1) 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.

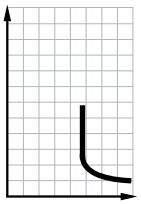
2) Accessories (auxiliary releases) for mounting on the right cannot be used.

3) For the use of 3RV1142 motor starter protectors with an energy-efficient IE3 motor we recommend using a contactor for normal switching duty, see also page 7/53.

Auxiliary switches and other accessories can be ordered separately (see "Accessories" page 7/70 onwards).

Selection and ordering data

Without auxiliary switches



Rated current	Suitable for three-phase motors[1] with *P*	Thermal overload release[2]	Instantaneous overcurrent releases	Short-circuit breaking capacity at 400 V AC	DT	Screw terminals		PU (UNIT, SET, M)	PS*	PG
I_n			$I >$	I_{cu}		Article No.	Price per PU			
A	kW	A	A	kA						
Size S3										
40	18.5	Without	520	50	A	**3RV1341-4FC10**		1	1 unit	41E
50	22	Without	650	50	A	**3RV1341-4HC10**		1	1 unit	41E
63	30	Without	819	50	A	**3RV1341-4JC10**		1	1 unit	41E
75[3]	37	Without	975	50	A	**3RV1341-4KC10**		1	1 unit	41E
90[3]	45	Without	1 170	50	A	**3RV1341-4LC10**		1	1 unit	41E
100[3]	45	Without	1 235	50	A	**3RV1341-4MC10**		1	1 unit	41E

3RV1341-4JC10

Size S3, with increased switching capacity										
16	7.5	Without	208	100	A	**3RV1342-4AC10**		1	1 unit	41E
20	7.5	Without	260	100	A	**3RV1342-4BC10**		1	1 unit	41E
25	11	Without	325	100	A	**3RV1342-4DC10**		1	1 unit	41E
32	15	Without	416	100	A	**3RV1342-4EC10**		1	1 unit	41E
40	18.5	Without	520	100	A	**3RV1342-4FC10**		1	1 unit	41E
50	22	Without	650	100	A	**3RV1342-4HC10**		1	1 unit	41E
63	30	Without	819	100	A	**3RV1342-4JC10**		1	1 unit	41E
75[3]	37	Without	975	100	A	**3RV1342-4KC10**		1	1 unit	41E
90[3]	45	Without	1 170	100	A	**3RV1342-4LC10**		1	1 unit	41E
100[3]	45	Without	1 235	100	A	**3RV1342-4MC10**		1	1 unit	41E

3RV1342-4JC10

[1] 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.

[2] For overload protection of the motors, appropriate overload relays must be used.

[3] For the use of 3RV134. motor starter protectors with an energy-efficient IE3 motor we recommend using a contactor for normal switching duty, see also page 7/53.

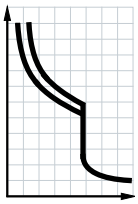
Auxiliary switches and other accessories can be ordered separately (see "Accessories" page 7/70 onwards).

Multi-unit/reusable packaging available on request.

For fuse monitoring

Selection and ordering data

Without auxiliary switches



Rated current	Thermal overload releases	Instantaneous overcurrent release	Short-circuit breaking capacity at 400 V AC	DT	Screw terminals	PU (UNIT, SET, M)	PS*	PG
I_n		$I >$	I_{cu}		Article No. / Price per PU			
A	A	A	kA					
Size S00								
0.2	0.2	1.2	100	▶	**3RV1611-0BD10**	1	1 unit	41E

3RV1611-0BD10

Note:

The auxiliary switch required for signaling must be ordered separately.

Multi-unit/reusable packaging available on request.

Accessories

Version	Contacts	DT	Screw terminals	PU (UNIT, SET, M)	PS*	PG
			Article No. / Price per PU			
Mountable auxiliary switches (essential accessories)						
Transverse auxiliary switches With screw terminals, mountable on front	1 NO + 1 NC	▶	**3RV1901-1E**	1	1 unit	41E
Lateral auxiliary switches With screw terminals, mountable on the left	1 NO + 1 NC	▶	**3RV1901-1A**	1	1 unit	41E

3RV1901-1E

3RV1901-1A

Additional auxiliary switches and other accessories, see "Accessories" page 7/70 onwards.

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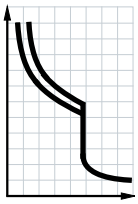
Selection and ordering data

Without auxiliary switches

Circuit breakers for system protection and non-motor loads according to UL/CSA



Rated current[1]	Thermal overload releases (non-adjustable)	Instantaneous overcurrent release	Short-circuit breaking capacity at 480 Y/277 V AC[2]	480 V AC	DT	Screw terminals	PU (UNIT, SET, M)	PS*	PG
I_n[1]		$I >$	I_{bc}	I_{bc}		Article No. / Price per PU			
A	A	A	kA	kA					
Size S3									
10	10	150	65	65	B	**3RV1742-5AD10**	1	1 unit	41E
15	15	225	65	65	B	**3RV1742-5BD10**	1	1 unit	41E
20	20	260	65	65	B	**3RV1742-5CD10**	1	1 unit	41E
25	25	325	65	65	B	**3RV1742-5DD10**	1	1 unit	41E
30	30	390	65	65	B	**3RV1742-5ED10**	1	1 unit	41E
35	35	455	65	--	B	**3RV1742-5FD10**	1	1 unit	41E
40	40	520	65	--	B	**3RV1742-5GD10**	1	1 unit	41E
45	45	585	65	--	B	**3RV1742-5HD10**	1	1 unit	41E
50	50	650	65	--	B	**3RV1742-5JD10**	1	1 unit	41E
60	60	780	65	--	B	**3RV1742-5LD10**	1	1 unit	41E
70	70	910	65	--	B	**3RV1742-5QD10**	1	1 unit	41E

3RV1742-5FD10

1) Rated value 100 % according to UL 489 and IEC 60947-2 ("100 % rated breaker").

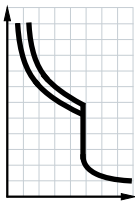
2) Values for 600 Y/347 V AC, see page 7/57.

Transverse auxiliary switches must not be mounted, lateral auxiliary switches can be ordered separately (see "Accessories" page 7/70 onwards).

For distance protection

Selection and ordering data

Voltage transformer motor starter protectors with auxiliary switches (1 CO)



Rated current	Thermal overload releases	Instantaneous overcurrent release	Auxiliary switch integrated in the motor starter protector, transverse	Short-circuit breaking capacity at 400 V AC	DT	Screw terminals		PU (UNIT, SET, M)	PS*	PG
I_n		$I >$		I_{cu}		Article No.	Price per PU			
A	A	A		kA						
Size S00										
1.4	1.4	6	1 CO	50	B	**3RV1611-1AG14**		1	1 unit	41E
2.5	2.5	10.5	1 CO	50	▶	**3RV1611-1CG14**		1	1 unit	41E
3	3	20	1 CO	50	▶	**3RV1611-1DG14**		1	1 unit	41E

3RV1611-1.G14

Accessories

Version	Contacts	DT	Screw terminals		PU (UNIT, SET, M)	PS*	PG
			Article No.	Price per PU			
Mountable auxiliary switches for other signaling purposes							
Lateral auxiliary switches With screw terminals, mountable on the left	1 NO + 1 NC	▶	**3RV1901-1A**		1	1 unit	41E

3RV1901-1A

Additional auxiliary switches and other accessories,
see "Accessories" page 7/70 onwards.

7

his quantity or a multiple thereof.
Illustrations are approximate

Overview

Mounting location and function

The 3RV1 motor starter protectors/circuit breakers have three main contact elements. In order to achieve maximum flexibility, auxiliary switches, signaling switches, auxiliary releases and isolator modules can be supplied separately.

These components are easily fitted to the switches without the use of any tools according to requirements.

Overview graphic, see page 7/51.

Front side Notes: • A maximum of four auxiliary contacts with auxiliary switches can be mounted on each motor starter protector. • Transverse auxiliary switches must not be used for the 3RV1742 circuit breakers.	**Transverse auxiliary switches, solid-state compatible transverse auxiliary switches** 1 NO + 1 NC or 2 NO or 1 CO	An auxiliary switch block can be inserted transversely on the front. The overall width of the motor starter protectors remains unchanged.
Left-hand side Notes: • A maximum of four auxiliary contacts with auxiliary switches can be mounted on each motor starter protector/circuit breakers. • Lateral auxiliary switches (two contacts) and signaling switches can be mounted separately or together. • The signaling switch cannot be used for the 3RV1742 circuit breakers.	**Lateral auxiliary switches (2 contacts)** 1 NO + 1 NC or 2 NO or 2 NC	One of the three lateral auxiliary switches can be mounted on the left side per motor starter protector/circuit breaker. The contacts of the auxiliary switch close and open together with the main contacts of the motor starter protector/circuit breaker. The width of the lateral auxiliary switch with two contacts is 9 mm.
	Lateral auxiliary switches (4 contacts) 2 NO + 2 NC	One lateral auxiliary switch with four contacts can be mounted on the left side per motor starter protector/circuit breaker. The contacts of the auxiliary switch close and open together with the main contacts of the motor starter protector/circuit breaker. The width of the lateral auxiliary switch with four contacts is 18 mm.
	Signaling switches Tripping 1 NO + 1 NC Short circuit 1 NO + 1 NC	One signaling switch can be mounted on the left side of each motor starter protector. The signaling switch has two contact systems. One contact system always signals tripping irrespective of whether this was caused by a short circuit, an overload or an auxiliary release. The other contact system only switches in the event of a short circuit. There is no signaling as a result of switching off with the actuator. In order to be able to switch on the motor starter protector again after a short circuit, the signaling switch must be reset manually after the error cause has been eliminated. The overall width of the signaling switch is 18 mm.
Right-hand side Notes: • One auxiliary release can be mounted per motor starter protector/circuit breaker. • Accessories cannot be mounted at the right-hand side of the 3RV11 motor starter protectors for motor protection with overload relay function.	**Auxiliary releases**	
	Shunt releases	For remote-controlled tripping of the motor starter protector/circuit breaker. The release coil should only be energized for short periods (see circuit diagrams).
	or	
	Undervoltage releases	Trips the motor starter protector/circuit breaker when the voltage is interrupted and prevents the motor from being restarted accidentally when the voltage is restored. Used for remote-controlled tripping of the motor starter protector/circuit breaker. Particularly suitable for EMERGENCY-STOP disconnection by way of corresponding EMERGENCY-STOP pushbuttons according to DIN EN 60204-1.
	or	
	Undervoltage releases with leading auxiliary contacts 2 NO	Function and use as for the undervoltage release without leading auxiliary contacts, but with the following additional function: the auxiliary contacts will open in switch position OFF to deenergize the coil of the undervoltage release, thus interrupting energy consumption. In the "tripped" position, these auxiliary contacts are not guaranteed to open. The leading contacts permit the motor starter protector/circuit breaker to reclose. The overall width of the auxiliary release is 18 mm.

For a complete overview of which accessories can be used for the various motor starter protectors, see page 7/3.

Mountable accessories

Selection and ordering data

Version	Contacts	For motor starter protectors/ circuit breakers Size	DT	**Screw terminals** Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Auxiliary switches[1]								
 3RV1901-1E **Transverse auxiliary switches** With screw terminals, mountable on front	1 CO	S00, S3	▶	**3RV1901-1D**		1	1 unit	41E
	1 NO + 1 NC		▶	**3RV1901-1E**		1	1 unit	41E
	2 NO		▶	**3RV1901-1F**		1	1 unit	41E
 3RV1901-1G **Electronic compatible transverse auxiliary switches** With screw terminals, front mountable, for operation in dusty atmosphere and in solid-state circuits with low operating currents	1 CO	S00, S3	A	**3RV1901-1G**		1	1 unit	41E
 3RV1901-0H **Covers for transverse auxiliary switches**	--	S00, S3	▶	**3RV1901-0H**		1	10 units	41E
 3RV1901-1A **Lateral auxiliary switches** With screw terminals, mountable on the left	1 NO + 1 NC	S00, S3	▶	**3RV1901-1A**		1	1 unit	41E
	2 NO		▶	**3RV1901-1B**		1	1 unit	41E
	2 NC		▶	**3RV1901-1C**		1	1 unit	41E
 3RV1901-1J	2 NO + 2 NC		A	**3RV1901-1J**		1	1 unit	41E

[1] Each motor starter protector can be fitted with one transverse and one lateral auxiliary switch. The lateral auxiliary switch with 2 NO + 2 NC is used without a transverse auxiliary switch. Transverse auxiliary switches must not be used for the 3RV1742 circuit breakers.

Version	Contacts	For motor starter protectors/ circuit breakers Size	DT	**Spring-type terminals** Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Auxiliary switches[1]								
 3RV1901-2E **Transverse auxiliary switches** With spring-type terminals, mountable on the front	1 NO + 1 NC	S00, S3	▶	**3RV1901-2E**		1	1 unit	41E
	2 NO		▶	**3RV1901-2F**		1	1 unit	41E
 3RV1901-2A **Lateral auxiliary switches** With spring-type terminals, mountable on the left	1 NO + 1 NC	S00, S3	▶	**3RV1901-2A**		1	1 unit	41E
	2 NO		▶	**3RV1901-2B**		1	1 unit	41E
	2 NC		▶	**3RV1901-2C**		1	1 unit	41E

[1] Each motor starter protector can be fitted with one transverse and one lateral auxiliary switch. Transverse auxiliary switches must not be used for the 3RV1742 circuit breakers.

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Version			For motor starter protectors	DT	Screw terminals	PU (UNIT, SET, M)	PS*	PG
			Size		Article No. / Price per PU			
Signaling switches[1]								
 3RV1921-1M	**Signaling switches** One signaling switch can be mounted on the left per motor starter protector.	Separate tripped and short-circuit alarms, 1 NO + 1 NC each	S3	▶	**3RV1921-1M**	1	1 unit	41E

[1] This accessory cannot be used for the 3RV1742 circuit breakers.

Rated control supply voltage U_s AC 50 Hz	AC 60 Hz	AC 50/60 Hz 100 % ON period[1]	AC/DC 50/60 Hz, DC 5 s ON period[2]	DC	For motor starter protectors/ circuit breakers	DT	Screw terminals	PU (UNIT, SET, M)	PS*	PG
V	V	V	V	V	Size		Article No. / Price per PU			
Auxiliary releases[3]										
 3RV1902-1DP0	**Undervoltage releases**									
--	--	--	--	24	S3	A	**3RV1902-1AB4**	1	1 unit	41E
24	--	--	--	--	S3	A	**3RV1902-1AB0**	1	1 unit	41E
110	120	--	--	--	S3	A	**3RV1902-1AF0**	1	1 unit	41E
--	208	--	--	--	S3	A	**3RV1902-1AM1**	1	1 unit	41E
230	240	--	--	--	S3	▶	**3RV1902-1AP0**	1	1 unit	41E
400	440	--	--	--	S3	▶	**3RV1902-1AV0**	1	1 unit	41E
415	480	--	--	--	S3	A	**3RV1902-1AV1**	1	1 unit	41E
500	600	--	--	--	S3	A	**3RV1902-1AS0**	1	1 unit	41E
	Undervoltage releases with leading auxiliary contacts 2 NO									
230	240	--	--	--	S3	A	**3RV1922-1CP0**	1	1 unit	41E
400	440	--	--	--	S3	A	**3RV1922-1CV0**	1	1 unit	41E
415	480	--	--	--	S3	A	**3RV1922-1CV1**	1	1 unit	41E
	Shunt releases									
--	--	20 ... 24	20 ... 70	--	S3	▶	**3RV1902-1DB0**	1	1 unit	41E
--	--	90 ... 110	70 ... 190	--	S3	A	**3RV1902-1DF0**	1	1 unit	41E
--	--	210 ... 240	190 ... 330	--	S3	▶	**3RV1902-1DP0**	1	1 unit	41E
--	--	350 ... 415	330 ... 500	--	S3	A	**3RV1902-1DV0**	1	1 unit	41E
--	--	500	500	--	S3	A	**3RV1902-1DS0**	1	1 unit	41E

[1] The voltage range is valid for 100 % (infinite) ON period. The response voltage lies at 0.9 of the lower limit of the voltage range.

[2] The voltage range is valid for 5 s ON period at AC 50/60Hz and DC. The response voltage lies at 0.85 of the lower limit of the voltage range.

[3] One auxiliary release can be mounted on the right per motor starter protector (does not apply to 3RV11 motor starter protectors with overload relay function).

Busbar accessories

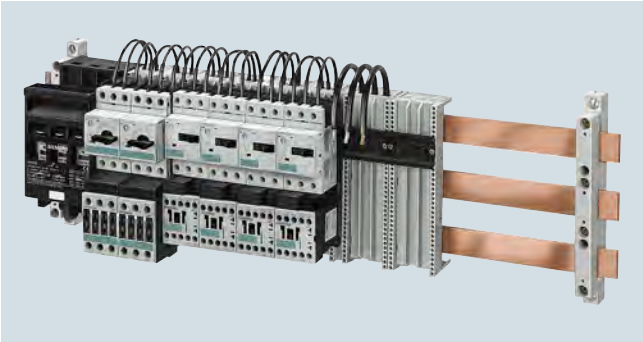
Overview

8US busbar adapters for 40 mm and 60 mm systems

The motor starter protectors/circuit breakers are mounted directly with the aid of busbar adapters on busbar systems with 40 mm and 60 mm center-to-center clearance in order to save space and to reduce infeed times and costs. Busbar adapters for busbar systems with 40 mm center-to-center clearance are suitable for copper busbars with a width of 12 mm to 15 mm, while those with 60 mm center-to-center clearance are suitable for copper busbars with a width of 12 mm to 30 mm. The busbars can be 4 to 5 mm or 10 mm thick.

The motor starter protectors/circuit breakers are snapped onto the adapter and connected on the line side. This prepared unit is then plugged directly onto the busbar system, and is thus connected both mechanically and electrically at the same time.

For further busbar adapters for snap-mounting direct-on-line starters and reversing starters as well as additional accessories such as line terminals and outgoing terminals, flat copper profile, etc., see Catalog LV 10 “Low-Voltage Power Distribution and Electrical Installation Technology”.



SIRIUS load feeders with busbar adapters snapped onto busbars

Selection and ordering data

8US busbar adapters

8US1111-4SM00

8US1211-4TR00

For motor starter protectors	Rated current	Connecting cable	Adapter length	Adapter width	Rated voltage	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Size	A	AWG	mm	mm	V						
Busbar adapters for 40 mm systems											
For flat copper profiles according to DIN 46433 Width: 12 mm and 15 mm Thickness: 5 mm and 10 mm											
S3	100	4	182	70	400[1]	▶	**8US1111-4SM00**		1	1 unit	14O
S3	100	4	182	72	415 ... 690[2]	▶	**8US1011-4TM00**		1	1 unit	14O
Busbar adapters for 60 mm systems											
For flat copper profiles according to DIN 46433 Width: 12 mm and 30 mm Thickness: 5 mm and 10 mm also for T and double-T special profiles											
S3	100	4	182	70	400[1]	▶	**8US1111-4SM00**		1	1 unit	14O
S3	100	4	182	72	415 ... 690[2]	A	**8US1211-4TM00**		1	1 unit	14O
S3[3]	70[4]	4	215	72	600[4]	A	**8US1211-4TR00**		1	1 unit	14O

For additional busbar adapters, see Catalog LV 10 "Low-Voltage Power Distribution and Electrical Installation Technology".

1) At rated voltage
≤ 400 V: short-circuit breaking capacity 50 kA,
> 400 to 460 V: short-circuit breaking capacity 25 kA.

2) Short-circuit breaking capacity 415/500/525 V AC:
- Up to I_n = 25 A: max. 30 kA
- Up to I_n = 90 A: max. 16 kA
- Up to I_n = 100 A: max. 6 kA
Short-circuit breaking capacity 690 V AC:
- Max. 12 kA.

3) This busbar adapter is approved specially for 3RV1742 circuit breakers for applications according to UL/CSA.

4) Values according to UL/CSA
- Rated current: 70 A at 600 V AC;
- Short-circuit breaking capacity:
480 V AC: 65 kA, up to I_n = 30 A;
480 Y/277 V AC: 65 kA,
600 Y/347 V AC: 20 kA.

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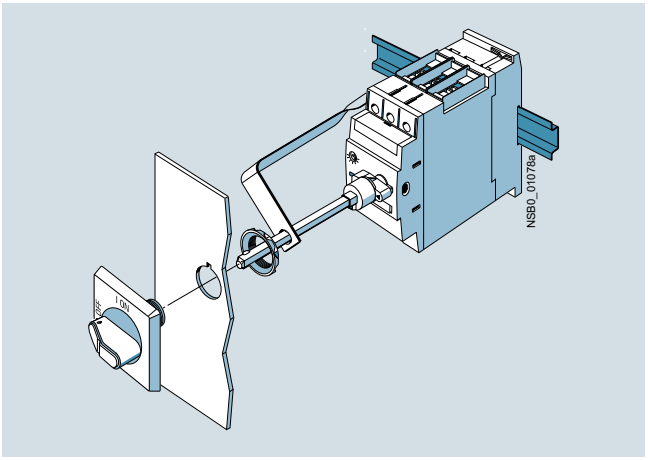
روبروی پالایشگاه نفت پارس، پلاک ۱۲

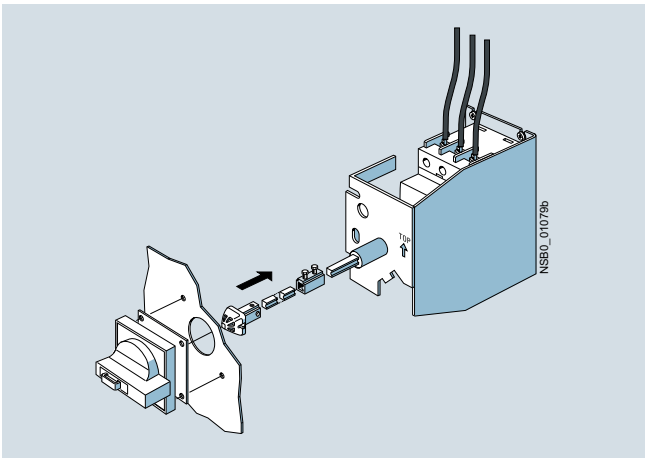
Overview

Door-coupling rotary operating mechanisms

Motor starter protectors/circuit breakers with a rotary operating mechanism can be mounted in a control cabinet and operated externally by means of a door-coupling rotary operating mechanism. When the cabinet door with motor starter protector/circuit breaker is closed, the operating mechanism is coupled. When the motor starter protector/circuit breaker closes, the coupling is locked which prevents the door from being opened unintentionally. This interlock can be defeated by the maintenance personnel. In the OPEN position, the rotary operating mechanism can be secured against reclosing with up to three padlocks. Inadvertent opening of the door is not possible in this case either.



SIRIUS 3RV1926-0K door-coupling rotary operating mechanism



SIRIUS 3RV2946-2B door-coupling rotary operating mechanism for arduous conditions

Remote motorized operating mechanisms

3RV1 motor starter protectors/circuit breakers are manually operated controls. They automatically trip in case of an overload or short circuit. Intentional remote-controlled tripping is possible by means of a shunt release or an undervoltage release. Reclosing is only possible directly at the motor starter protector/circuit breaker.

The remote motorized operating mechanism allows the motor starter protectors/circuit breakers to be opened and closed by electrical commands. This enables a load or an installation to be isolated from the network or reconnected to it from an operator panel.

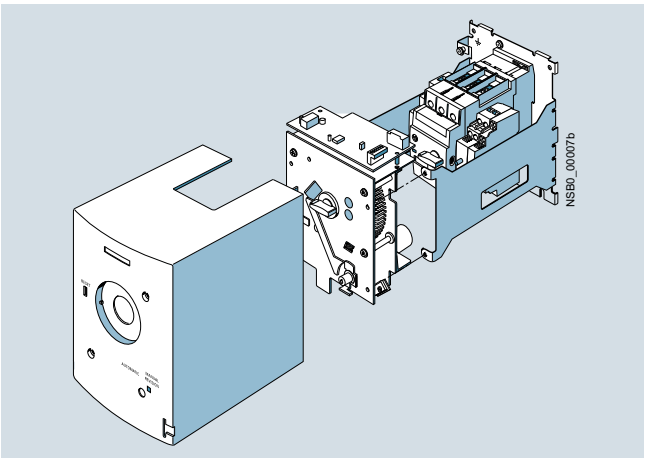
If the motor starter protector/circuit breaker is tripped as a result of overload or short circuit, it will be in tripped position. For reclosing, the remote motorized operating mechanism must first be set manually or electrically to the 0 position (electrically by means of the Open command). Then it can be reclosed.

The remote motorized operating mechanism is available for motor starter protectors/circuit breakers in size S3 for control voltages of 230 V AC and 24 V DC. The motor starter protector/circuit breaker is fitted into the remote motorized operating mechanism as shown in the drawing.

In the "MANUAL" position, the motor starter protector/circuit breaker in the remote motorized operating mechanism can continue to be switched manually on site. In the "AUTOMATIC" position, the motor starter protector/circuit breaker is switched by means of electrical commands. The switching command must be applied for a minimum of 100 ms. The remote motorized operating mechanism closes the motor starter protector/circuit breaker after a maximum of 1 s. On voltage failure during the switching operation it is ensured that the motor starter protector/circuit breaker remains in the "OPEN" or "CLOSED" position. In the "MANUAL" and "OFF" position, the remote motorized operating mechanism can be locked with a padlock.

RESET function

The RESET button on the motorized operating mechanism serves to reset any 3RV1921-1M signaling switch that might be installed.



SIRIUS 3RV1946-3A.. remote motorized operating mechanism

Rotary operating mechanisms

Technical specifications

Remote motorized operating mechanisms

Type		3RV1946
Max. power consumption • At U_s = 24 V DC • At U_s = 230 V AC	 W VA	 48 170
Operating range		0.85 ... 1.1 x U_s
Minimum command duration at U_s	s	0.1
Max. command duration		Unlimited (uninterrupted operation)
Max. total break time, remote-controlled	s	2
Ready to reclose after approx.	s	2.5
Switching frequency	1/h	25
Internal back-up fuse • 230 V AC • 24 V DC	 A A	 0.8 1.6
Connection type of control cables		Plug-in connectors with screw terminals
Shock resistance acc. to IEC 60068-2-27	g/ms	25/11 (square and sine pulse)

Selection and ordering data

Door-coupling rotary operating mechanisms


3RV2926-0B

The door-coupling rotary operating mechanisms consist of a knob, a coupling driver and a 130/330 mm long extension shaft (6 mm x 6 mm).

The door-coupling rotary operating mechanisms are designed to degree of protection IP64. The door locking device prevents accidental opening of the control cabinet door in the ON position of the motor starter protector/circuit breaker. The OFF position can be locked with up to 3 padlocks.

Version	Color of actuator	Version of extension shaft mm	For motor starter protectors/ circuit breakers Size	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Door-coupling rotary operating mechanisms	Black	130	S3	▶	**3RV2926-0B**	1	1 unit		41E
		330	S3	▶	**3RV2926-0K**	1	1 unit		41E
EMERGENCY STOP door-coupling rotary operating mechanisms	Red/yellow	130	S3	▶	**3RV2926-0C**	1	1 unit		41E
		330	S3	▶	**3RV2926-0L**	1	1 unit		41E

Door-coupling rotary operating mechanisms for arduous conditions


3RV2946-2B

The door-coupling rotary operating mechanisms consist of a knob, a coupling driver, an extension shaft of 300 mm in length (8 mm x 8 mm), a spacer and two metal brackets, into which the motor starter protector/circuit breaker is inserted.

The door-coupling rotary operating mechanisms are designed to degree of protection IP65. The door interlocking reliably prevents opening of the control cabinet door in the ON position of the motor starter protector/circuit breaker. The OFF position can be locked with up to three padlocks.

Laterally mountable auxiliary releases and two-pole auxiliary switches can be used.
The door-coupling rotary operating mechanisms thus meet the requirements for isolating functions according to IEC 60947-2.

Version	Color of actuator	Version of extension shaft mm	For motor starter protectors/ circuit breakers Size	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Door-coupling rotary operating mechanisms	Gray	300	S3	▶	**3RV2946-2B**	1	1 unit		41E
EMERGENCY STOP door-coupling rotary operating mechanisms	Red/yellow	300	S3	▶	**3RV2946-2C**	1	1 unit		41E

Version	Rated control supply voltage U_s	For motor starter protectors/ circuit breakers Size	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Remote motorized operating mechanisms								
Remote motorized operating mechanisms	AC 50/60 Hz, 230 V	S3	X	**3RV1946-3AP0**		1	1 unit	41E
	24 V DC	S3	X	**3RV1946-3AB4**		1	1 unit	41E


3RV1946-3A..

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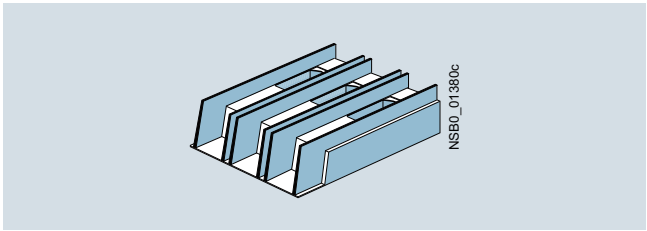
his quantity or a multiple thereof.
Illustrations are approximate

Overview

Terminal blocks for "Self-Protected Combination Motor Controllers (Type E)" according to UL 508/UL 60947-4-1

The 3RV10 motor starter protector/circuit breakers in size S3 are approved according to UL 508/UL 60947-4-1 as "Self-Protected Combination Motor Controllers" (Type E).

This requires increased clearance and creepage distances (1 inch and 2 inches respectively) at the input side of the device, which are achieved by replacing the standard box terminal with the 3RT1946-4GA07 terminal block.



Terminal block (Type E) SIRIUS 3RT1946-4GA07

According to CSA, the terminal blocks can be omitted when the device is used as a "Self-Protected Combination Motor Controller" (Type E).

Selection and ordering data

Accessories

	Version	For motor starter protectors/ circuit breakers Size	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Covers								
 3RV1 (size S3) with 3RT1946-4EA1 (left) 3RV1908-0P (right)	**Terminal covers for box terminals** Additional touch protection to be fitted at the box terminals (2 units mountable per device)	S3	▶	**3RT1946-4EA2**		1	1 unit	41B
	Terminal covers For cable lug and busbar connection for maintaining the required voltage clearances and as touch protection if box terminal is removed (2 units can be mounted per motor starter protector/circuit breaker)	S3	B	**3RT1946-4EA1**		1	1 unit	41B
	Scale covers Sealable, for covering the set current scale	S3	▶	**3RV1908-0P**		100	10 units	41E
Fixing accessories								
 3RB1900-0B	**Push-in lugs** For screwing the motor starter protector onto mounting plates For each motor starter protector, two units are required.	S00	A	**3RB1900-0B**		100	10 units	41F
Terminal blocks for "Self-Protected Combination Motor Controllers (Type E)" according to UL 508/UL 60497-4-1								
 3RT1946-4GA07	Note: UL 508/UL 60947-4-1 approval demands 1-inch clearance and 2-inch creepage distance for "Combination Motor Controllers Type E". The following terminal blocks must be used therefore in 3RV10 motor starter protector size S3. The terminal blocks are not required for use according to CSA. With size S3, these terminal blocks cannot be used in combination with a transverse auxiliary switch.							
	Terminal block type E for extended clearance and creepage distances (1 and 2 inch)	S3	B	**3RT1946-4GA07**		1	1 unit	41B
Auxiliary terminals, 3-pole								
 3RT1946-4F	For connection of auxiliary and control cables to the main conductor connections (for one side)	S3	B	**3RT1946-4F**		1	1 unit	41B

7

Mounting accessories

Link modules

Actuating voltage of contactor	Size: Contactors	Size: Motor starter protectors/ circuit breakers	DT	Screw terminals: Article No.	Screw terminals: Price per PU	PU (UNIT, SET, M)	PS*	PG
Link modules from motor starter protector/circuit breaker to contactor								
For mechanical and electrical connection between motor starter protector/circuit breaker and contactor with screw terminals								
Single-unit packaging								
AC	S3	S3	▶	**3RA1941-1AA00**		1	1 unit	41B
DC	S3	S3	▶	**3RA1941-1BA00**		1	1 unit	41B
Multi-unit packaging								
AC	S3	S3	▶	**3RA1941-1A**		1	5 units	41B
DC	S3	S3	▶	**3RA1941-1B**		1	5 units	41B


3RA1941-1AA00

Miscellaneous accessories

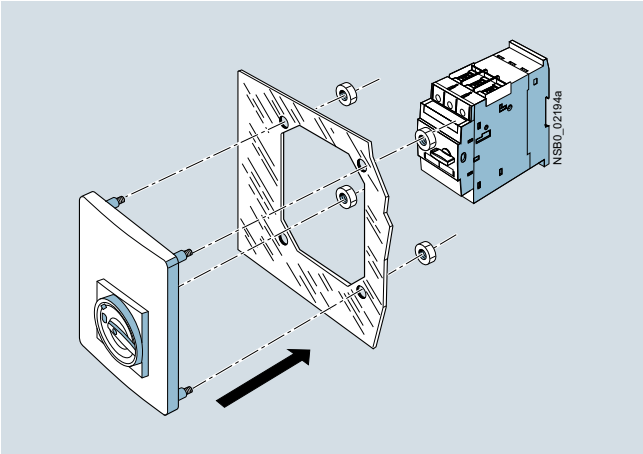
Version	Size	Color	For motor starter protectors/ circuit breakers: Size	DT	Spring-type terminals: Article No.	Spring-type terminals: Price per PU	PU (UNIT, SET, M)	PS*	PG
Tools for opening spring-type terminals									
Screwdrivers For all SIRIUS devices with spring-type terminals	Length approx. 200 mm, 3.0 mm x 0.5 mm	Titanium gray/ black, partially insulated	S3	A	**3RA2908-1A**		1	1 unit	41B


3RA2908-1A

Overview

Front plates

Motor starter protectors are frequently required to be actuated in any enclosure. Front plates equipped with a rotary operating mechanism for 3RV1.4. motor starter protectors/circuit breakers are available for this purpose.



Front plate for size S3

Selection and ordering data

Version	Degree of protection	For motor starter protectors Size	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Front plates								
 3RV1923-4B **Molded-plastic front plates with rotary operating mechanism,** lockable in 0 position For actuation of 3RV1 motor starter protectors in any enclosure	IP55 (front side)	S3	►	**3RV1923-4B**		1	1 unit	41E
Molded-plastic front plates with EMERGENCY-STOP rotary operating mechanism, red/yellow, lockable in 0 position EMERGENCY-STOP actuation of 3RV1 motor starter protectors in any enclosure	IP55 (front side)	S3	A	**3RV1923-4E**		1	1 unit	41E

Version	Rated control supply voltage U_s	For motor starter protectors Size	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	V							
Indicator lights								
 3RV1903-5B **Indicator lights** For all enclosures and front plates • With LED lamp for versions 110 ... 120 V, with glow lamp for versions 220 ... 500 V • With colored lenses red, green, yellow, orange and clear	110 ... 120 220 ... 240 380 ... 415 480 ... 500	S3	C C C C	**3RV1903-5B** **3RV1903-5C** **3RV1903-5E** **3RV1903-5G**		1 1 1 1	1 unit 1 unit 1 unit 1 unit	41E 41E 41E 41E

7

Overview

SIRIUS 3RV1063-7AL10 molded case motor starter protector

The 3RV10 and 3RV13 molded case motor starter protectors for up to 800 A are compact, current-limiting motor starter protectors which can be used above all in motor feeders for special voltages of 440 V, 480 V, 550 V and 690 V. They are used for switching and protecting three-phase motors and other loads with rated currents up to 800 A.

Note:

For motor feeders above 100 A and at 400 V and 500 V, the 3VL molded case circuit breakers must be used, see Catalog LV 10 "Low-Voltage Power Distribution and Electrical Installation Technology".

Type of construction

The molded case motor starter protectors are available in 4 widths:

- 3RV1353 – width 90 mm, max. rated current 32 A, at 550 V AC suitable for three-phase motors up to 22 kW
- 3RV1.6. – width 105 mm, max. rated current 250 A, at 690 V AC suitable for three-phase motors up to 160 kW
- 3RV1.7. – width 140 mm, max. rated current 630 A, at 690 V AC suitable for three-phase motors up to 315 kW
- 3RV1.83 – width 210 mm, max. rated current 800 A, at 690 V AC suitable for three-phase motors up to 500 kW

The 3RV1 molded case motor starter protectors for up to 800 A can be mounted in horizontal, vertical or lying arrangement directly on a mounting plate or mounting rail. Their rated data are adversely affected as the result.

The phase barriers for better insulation between the phases are included in the scope of supply, and it is essential to use them.

The motor starter protectors can be supplied through top and bottom terminals without impairing their function, enabling them to be installed in any type of switchgear without any further steps.

Connection methods

The 3RV1 molded case motor starter protectors for up to 800 A are suitable solely for screw connection.

	Screw terminals
	The terminals are indicated in the corresponding tables by the symbols shown on orange backgrounds.

Article No. scheme

Digit of the Article No.	1st - 3rd	4th	5th	6th	7th		8th	9th	10th	11th	12th		13th	14th	15th	16th
	□□□	□	□	□	□	–	□	□	□	□	□	–	□	□	□	□
Molded case motor starter protectors	**3 R V**															
SIRIUS 1st generation		**1**														
Type of motor starter protector			□													
Size				□												
Breaking capacity					□											
Setting range for overload release							□	□								
Trip class (CLASS)									□							
Connection methods										□						
With or without auxiliary switch											□					
Special versions													□	□	□	□
Example	**3 R V**	**1**	**0**	**6**	**3**	**–**	**7**	**A**	**L**	**1**	**0**					

Note:

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

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

Benefits

- High short-circuit breaking capacity in the feeder
- Optimum usability in motor feeders for the special voltages 440 V, 480 V, 550 V and 690 V
- Compact design
- The releases are available both in purely magnetic (up to 32 A) and in solid-state versions (100 A to 800 A)
- Available for motor or starter protection (short-circuit protection alone)

Application

Operating conditions

The 3RV1 molded case motor starter protectors for up to 800 A can be operated at ambient temperatures between -25 °C and +70 °C. They can be used according to IEC 60721-2-1 in the most difficult environmental conditions with a hot and damp climate.

Since operational currents, starting currents and current peaks are different even for motors with identical power ratings due to the inrush current, the motor ratings in the selection tables are only guide values. The specific rated and start up data of the motor to be protected is always paramount to the choice of the most suitable molded case motor starter protectors.

The 3RV1 molded case motor starter protectors up to 800 A have not been tested for use with frequency converters. The possibility of premature tripping in such applications cannot therefore be ruled out.

Possible uses

The 3RV1 molded case motor starter protectors for up to 800 A are suitable as switching and protection devices for motors. The following versions are available:

- For motor protection;
  the overload and short-circuit releases are designed for optimized protection and direct-on-line starting of induction squirrel-cage motors. The motor starter protectors have an electronic release which not only provides short-circuit and overload protection but is also sensitive to phase failure and phase unbalance and offers protection in the event of rotor blockage.
- For starter combinations;
  these molded case motor starter protectors are used for short-circuit protection in combinations of circuit breaker, motor contactor and overload relay. They are equipped with a purely magnetic release (up to 32 A) or a solid-state release (100 A to 800 A).

Standards and specifications

The electronic releases for motor protection comply with IEC 60947-4-1. Isolating features are also compliant with IEC 60947-2.

The 3RV1 molded case motor starter protectors comply in addition with IEC 60068-2-6 (shock and vibration strength) and are certified for the specifications of the most important marine classification societies:

- RINA
- Det Norske Veritas
- Bureau Veritas
- Lloyds Register of Shipping
- Germanischer Lloyd
- American Bureau of Shipping

Technical specifications

General data

Type		3RV1063	3RV1073	3RV1083	3RV1353	3RV1363	3RV1364	3RV1373	3RV1374	3RV1383
Dimensions										
• W	mm	105	140	210	90	105	105	140	140	210
• H	mm	205	205	268	130	205	205	205	205	268
• D	mm	139	139	159	102	139	139	139	139	159
Standard		IEC 60947-2, EN 60947-2								
Motor protection		✓			--					
Starter combinations		--			✓					
Rated current I_n	A	160	400	630	160	250		400, 630		630, 800
Number of poles		3								
Rated operational voltage U_e 50 ... 60 Hz AC	V	690								
Rated impulse withstand voltage U_{imp}	V	8								
Rated insulation voltage U_i	V	1 000			800	1 000				
Test voltage at industrial frequency for 1 min	V	3 500			3 000	3 500				
Rated ultimate short-circuit breaking capacity I_{cu}										
• At 220/230 V AC, 50 ... 60 Hz	kA	200			120	200				
• At 380/415 V AC, 50 ... 60 Hz	kA	120		100	85	120	200	120	200	100
• At 440 V AC, 50 ... 60 Hz	kA	100		80	75	100	180	100	180	80
• At 500 V AC, 50 ... 60 Hz	kA	85		65	50	85	150	85	150	65
• At 550 V AC, 50 ... 60 Hz	kA	--			35	--				
• At 690 V AC, 50 ... 60 Hz	kA	70		30	10	70	80	70	80	30
Rated service short-circuit breaking capacity I_{cs} (% of I_{cu})										
• At 220/230 V AC, 50 ... 60 Hz	%	100		75	100					75
• At 380/415 V AC, 50 ... 60 Hz	%	100		75		100				75
• At 440 V AC, 50 ... 60 Hz	%	100		75		100				75
• At 500 V AC, 50 ... 60 Hz	%	100		75		100		100[1]/ 75[2]	100	75
• At 690 V AC, 50 ... 60 Hz	%	100		75		100		100[1]/ 50[2]	100	75
Rated short-circuit making capacity (415 V)	kA	264		220	187	264	440	264	440	220
Break time (415 V at I_{cu})	ms	5	6	7	3	5		6		7
Category (IEC 60947-2)		A	B (400 A), A (630 A)	B	A			B (400 A), A (630 A)		B
Isolating features		✓								
Trip class CLASS		10A, 10, 20, 30			--					
Releases										
• Magnetic type		--			✓	--				
• Electronic (motor protection)		✓			--[3]					
• Electronic (starter combinations)		--				✓				
Permissible ambient temperature										
• Operation	°C	-25 ... +70[4]								
• Storage	°C	-40 ... +70								
Mechanical endurance										
• Operating cycles		20 000			25 000	20 000				
• Operating cycles per hour		240	120		240			120		
Electrical endurance										
• Operating cycles		8 000	7 000	5 000	8 000			7 000		5 000
• Operating cycles per hour (415 V AC)		120	60		120			60		

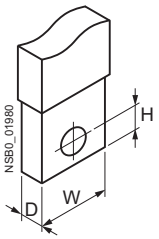
✓ Has this function

-- Does not have this function

1) Value applies for 3RV1373-7GN10 molded case motor starter protectors.

2) Value applies for 3RV1373-7JN10 molded case motor starter protectors.

3) For overload protection of the motors, appropriate overload relays must be used.

Main circuit terminals						
Type		**3RV1353**	**3RV1.6.**	**3RV1.7.**	**3RV1083-7JL10, 3RV1383-7JN10**	**3RV1383-7KN10**
Terminal dimensions						
Front-accessible standard terminals						
Busbars/cable lug						
Number	Unit(s)	11			2	
Dimensions						
• W	mm	20	25	35	40	50
• D	mm	5	8	10	5	
• H	mm	7.5	9.5	11	12	
• Lock hasp diameter	mm	6.5	8.5	10.5	7	
Front-extended terminals						
Busbars						
Number	Unit(s)	1		2		
Dimensions						
• W	mm	20		30	40	50
• D	mm	4	10	7	5	5
• Lock hasp diameter	mm	8.5	10	11		14
Cable lug						
Number	Unit(s)	1		2		
Dimensions						
• W	mm	20		30	40	50
• Lock hasp diameter	mm	8.5	10	11		14
Front-extended cable terminals for copper cable						
Busbars, flexible						
Number	Unit(s)	1			--	
Dimensions W x D x N						
• W	mm	13	15.5	24	--	
• D	mm	0.5	0.8	1	--	
• N (= number of laminations)	mm	10			--	
Cable lug, flexible						
Number	Unit(s)	1 or 2			--	
Dimensions						
• For 1 unit	mm^2	1 ... 70	2.5 ... 120	16 ... 240	--	
• For 2 units	mm^2	1 ... 50	2.5 ... 95	16 ... 150	--	
Cable lug, rigid						
Number	Unit(s)	1		1 or 2	--	
Dimensions						
• For 1 unit	mm^2	1 ... 95	2.5 ... 185	16 ... 300	--	
• For 2 units (for outside mounting)	mm^2	--		120 ... 240	--	
Rear terminals						
Busbars						
Number	Unit(s)	1		2		
Dimensions						
• W	mm	20		30	40	50
• D	mm	4	10	7	5	
• Lock hasp diameter	mm	8.5		11	14	

General data

Auxiliary switches

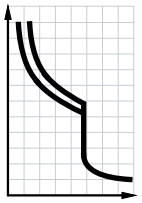
Type		3RV1991-1.A0
Rated operational current I_e		
• At 250 V AC/DC		
- At AC-14 (utilization category according to IEC 60947-5-1)		
Control supply voltage 125 V	A	6
Control supply voltage 250 V	A	5
- At DC-13 (utilization category according to IEC 60947-5-1)		
Control supply voltage 125 V	A	0.3
Control supply voltage 250 V	A	0.15
• At 24 V DC		
- Control supply voltage 24 V	mA	≥ 0.75
- Control supply voltage 5 V	mA	≥ 1

Auxiliary releases

		Power consumption during pick-up			
Molded case motor starter protectors		**3RV1353**		**3RV1.6., 3RV1.7., 3RV1.83**	
Version		AC	DC	AC	DC
Undervoltage releases		**3RV1952-1A.0**		**3RV1982-1A.0**	
• 24 ... 30 V AC/DC		1.5 VA	1.5 W	6 VA	150 W
• 110 ... 127 V AC/110 ... 125 V DC		2 VA	2 W	6 VA	150 W
• 220 ... 240 V AC/220 ... 250 V DC		2.5 VA	2.5 W	6 VA	150 W
Opening times	ms	15	15	≤ 25	≤ 15
Shunt releases		**3RV1952-1E.0**		**3RV1982-1E.0**	
• 24 ... 30 V AC/DC		50 VA	50 W	150 VA	150 W
• 110 ... 127 V AC/110 ... 125 V DC		50 VA	50 W	150 VA	150 W
• 220 ... 240 V AC/220 ... 250 V DC		50 VA	50 W	150 VA	150 W
Opening times	ms	15	15	15	15

Selection and ordering data

CLASS 10A, 10, 20, 30; without auxiliary switch



Rated current	Current setting of the inverse-time delayed overload releases "L"	Operating current of the instantaneous short-circuit releases "I"	Short-circuit breaking capacity at 400 V AC	DT	Screw terminals		PU (UNIT, SET, M)	PS*	PG
I_n		$I >$	I_{cu}		Article No.	Price per PU			
A	A	A	kA						
With electronic releases									
Standard switching capacity, adjustable short-circuit and overload release, TU 4									
100	40 ... 100	600 ... 1 300	120	D	**3RV1063-7AL10**		1	1 unit	41E
160	64 ... 160	960 ... 2 080	120	D	**3RV1063-7CL10**		1	1 unit	41E
200	80 ... 200	1 200 ... 2 600	120	D	**3RV1063-7DL10**		1	1 unit	41E
400	160 ... 400	2 400 ... 5 200	120	D	**3RV1073-7GL10**		1	1 unit	41E
630	252 ... 630	3 780 ... 8 190	100	D	**3RV1083-7JL10**		1	1 unit	41E

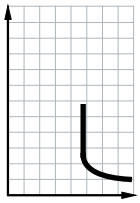
3RV10.3-7.L10

TU = trip unit (release)

Further accessories can be ordered separately
(see "Accessories" page 7/85 onwards).

Selection and ordering data

Without auxiliary switches



Rated current	Inverse-time delayed overload release "L"	Operating current of the instantaneous short-circuit releases "I"	Short-circuit breaking capacity at 400 V AC	DT	Screw terminals	PU (UNIT, SET, M)	PS*	PG
					Article No. Price per PU			
I_n		$I >$	I_{cu}					
A	A	A	kA					
With magnetic releases								
Standard switching capacity, non-adjustable short-circuit release, TU 1								
1	Without	13	85	D	**3RV1353-6AP10**	1	1 unit	41E
1.6	Without	21	85	D	**3RV1353-6BP10**	1	1 unit	41E
2	Without	26	85	D	**3RV1353-6CP10**	1	1 unit	41E
3.2	Without	42	85	D	**3RV1353-6DP10**	1	1 unit	41E
4	Without	52	85	D	**3RV1353-6EP10**	1	1 unit	41E
5	Without	65	85	D	**3RV1353-6FP10**	1	1 unit	41E
6.5	Without	85	85	D	**3RV1353-6GP10**	1	1 unit	41E
8.5	Without	111	85	D	**3RV1353-6HP10**	1	1 unit	41E
12.5	Without	163	85	D	**3RV1353-6JP10**	1	1 unit	41E
Standard switching capacity, adjustable short-circuit release, TU 2								
20	Without	120 ... 240	85	D	**3RV1353-6LM10**	1	1 unit	41E
32	Without	192 ... 384	85	D	**3RV1353-6MM10**	1	1 unit	41E

3RV1353-6.P10

With electronic releases								
Standard switching capacity, adjustable short-circuit release, TU 3								
100	Without	100 ... 1 000	120	D	**3RV1363-7AN10**	1	1 unit	41E
160	Without	160 ... 1 600	120	D	**3RV1363-7CN10**	1	1 unit	41E
250	Without	250 ... 2 500	120	D	**3RV1363-7EN10**	1	1 unit	41E
400	Without	400 ... 4 000	120	D	**3RV1373-7GN10**	1	1 unit	41E
630	Without	630 ... 6 300	120	D	**3RV1373-7JN10**	1	1 unit	41E
630	Without	630 ... 6 300	100	D	**3RV1383-7JN10**	1	1 unit	41E
800	Without	800 ... 8 000	100	D	**3RV1383-7KN10**	1	1 unit	41E
Increased switching capacity, adjustable short-circuit release, TU 3								
100	Without	100 ... 1 000	200	D	**3RV1364-7AN10**	1	1 unit	41E
160	Without	160 ... 1 600	200	D	**3RV1364-7CN10**	1	1 unit	41E
250	Without	250 ... 2 500	200	D	**3RV1364-7EN10**	1	1 unit	41E
400	Without	400 ... 4 000	200	D	**3RV1374-7GN10**	1	1 unit	41E

3RV13..-7.N10

TU = trip unit (release)

Further accessories can be ordered separately
(see "Accessories" page 7/85 onwards).

More information

Manual

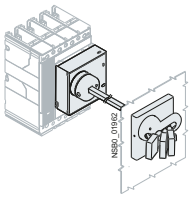
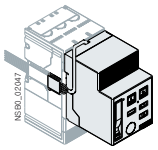
Selection and ordering data

Type	Version	For molded case motor starter protectors	DT	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Auxiliary switches								
 3RV1991-1AA0								
Auxiliary switches for front mounting	1 signaling switch Off-On + 1 tripped signal (250 V AC/DC)	3RV1353, 3RV1.6. ... 3RV1.83	D	**3RV1991-1AA0**		1	1 unit	41E
	3 signaling switches Off-On + 1 tripped signal (250 V AC/DC)		D	**3RV1991-1BA0**		1	1 unit	41E
	3 signaling switches Off-On + 1 tripped signal (24 V DC)		D	**3RV1991-1CA0**		1	1 unit	41E
Connection cables for auxiliary switches	Length 2 m, 6-pole	3RV1353, 3RV1.6. ... 3RV1.83	D	**3RV1991-1FA0**		1	1 unit	41E

Type	Rated control supply voltage U_s AC 50/60 Hz V	DC V	For molded case motor starter protectors	DT	Screw terminals Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Auxiliary releases									
 3RV1952-1AA0									
Undervoltage releases for front mounting	24 ... 30	24 ... 30	3RV1353	D	**3RV1952-1AA0**		1	1 unit	41E
	110 ... 127	110 ... 125		D	**3RV1952-1AD0**		1	1 unit	41E
	220 ... 240	220 ... 250		D	**3RV1952-1AE0**		1	1 unit	41E
	24 ... 30	24 ... 30	3RV1.6.	D	**3RV1982-1AA0**		1	1 unit	41E
	110 ... 127	110 ... 125	...	D	**3RV1982-1AD0**		1	1 unit	41E
	220 ... 240	220 ... 250	3RV1.83	D	**3RV1982-1AF0**		1	1 unit	41E
 3RV1952-1EA0									
Shunt releases for front mounting	24 ... 30	24 ... 30	3RV1353	D	**3RV1952-1EA0**		1	1 unit	41E
	110 ... 127	110 ... 125		D	**3RV1952-1ED0**		1	1 unit	41E
	220 ... 240	220 ... 250		D	**3RV1952-1EF0**		1	1 unit	41E
	24 ... 30	24 ... 30	3RV1.6.	D	**3RV1982-1EA0**		1	1 unit	41E
	110 ... 127	110 ... 125	...	D	**3RV1982-1ED0**		1	1 unit	41E
	220 ... 240	220 ... 250	3RV1.83	D	**3RV1982-1EF0**		1	1 unit	41E
Connection cables for undervoltage and shunt releases	Length 2 m, 6-pole		3RV1353, 3RV1.6. ... 3RV1.83	D	**3RV1992-1FA0**		1	1 unit	41E

Rotary operating mechanisms, mounting accessories

Selection and ordering data

	Version		For molded case motor starter protectors	DT	Screw terminals ⊕ Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Rotary operating mechanisms									
 3RV19.6-0BA0	**Lever-type rotary operating mechanisms**	With adjustable distance, with lock/door interlocking (padlocks are not included in scope of supply)	3RV1353	D	**3RV1956-0BA0**		1	1 unit	41E
			3RV1.6., 3RV1.7.	D	**3RV1976-0BA0**		1	1 unit	41E
			3RV1.83	D	**3RV1986-0BA0**		1	1 unit	41E
 3RV19.6-3AP3	**Motorized operating mechanisms**	With stored energy mechanism, 220 ... 250 V AC/DC	3RV1.6., 3RV1.7.	D	**3RV1976-3AP3**		1	1 unit	41E
			3RV1.83	D	**3RV1986-3AP3**		1	1 unit	41E
Connections									
 3RV1975-1CA0	**Connections**	Front-extended (1 set = 6 units)	3RV1353	D	**3RV1955-1AA0**		1	1 unit	41E
			3RV1.6.	D	**3RV1965-1BA0**		1	1 unit	41E
			3RV1.7.	D	**3RV1975-1CA0**		1	1 unit	41E
			3RV1.83-7J.10	D	**3RV1985-1DA0**		1	1 unit	41E
			3RV1.83-7KN10	D	**3RV1985-1EA0**		1	1 unit	41E
 3RV1955-3AA0		Rear (1 set = 3 units)	3RV1353	D	**3RV1955-3AA0**		1	1 unit	41E
			3RV1.6.	D	**3RV1965-3AA0**		1	1 unit	41E
			3RV1.7.	D	**3RV1975-3AA0**		1	1 unit	41E
			3RV1.83	D	**3RV1985-3AA0**		1	1 unit	41E
 3RV1975-2AA0	**Cable terminals**	Front-extended (1 set = 6 units)	3RV1353	D	**3RV1955-2AA0**		1	1 unit	41E
			3RV1.6.	D	**3RV1965-2BA0**		1	1 unit	41E
			3RV1.7.-7G.10	D	**3RV1975-2CA0**		1	1 unit	41E
			3RV1.73-7JN10	D	**3RV1975-2DA0**		1	1 unit	41E

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his quantity or a multiple thereof.
Illustrations are approximate

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	• 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]	• Allows easy and consistent configuration with one series of overload relays (for small to large loads)
Protection functions							
Tripping due to overload	✓	✓	✓	✓	✓	✓	• Provides optimum inverse-time delayed protection of loads against excessive temperature rises due to overload
Tripping due to phase unbalance	✓	✓	✓	✓	✓	✓	• Provides optimum inverse-time delayed protection of loads against excessive temperature rises due to phase unbalance
Tripping due to phase failure	✓	✓	✓	✓	✓	✓	• Minimizes heating of three-phase 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**	--[2]	--[2]	--[2]	--[2]	✓	✓	• 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)	✓	✓	• Provides optimum protection of loads against high-resistance short circuits or ground faults due to moisture, condensed water, damage to the insulation material, etc. • Eliminates the need for additional special equipment • Saves space in the control cabinet • Reduces wiring outlay and costs

✓ Available
-- Not available

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

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

General data

Features	3RU21	3RU11	3RB30/3RB31	3RB20/3RB21	3RB22/3RB23	3RB24	Benefits
Features							
RESET function	✓	✓	✓	✓	✓	✓	• 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)	• Allows the remote resetting of the device
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)	✓	✓	✓	✓	✓ (2 ×)	--	• 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)	--	--	--	--	--	✓	• Enables the controlling of contactors directly from the higher-level control system through IO-Link
IO-Link connection	--	--	--	--	--	✓	• Reduction of wiring in the control cabinet • Enables communication
Connection of optional hand-held device	--	--	--	--	--	✓	• Enables local operation
Communication capability through IO-Link							
Full starter functionality through IO-Link	--	--	--	--	--	✓	• 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	--	--	--	--	--	✓	• Enables the reading out of diagnostics information such as overload, open circuit, ground fault, etc.
Reading out of current values	--	--	--	--	--	✓	• Enables the reading out of current values and their direct processing in the higher-level control system
Reading out all set parameters	--	--	--	--	--	✓	• 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)	✓	✓	✓	✓	✓	✓	• 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]	• Simplifies configuration • Reduces wiring outlay and costs • Enables stand-alone installation as well as space-saving direct mounting
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)	--	--	✓ (S2)	✓ (S3 ... S6)	✓ (S00 ... S6)	✓ (S00 ... S6)	• 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 circuit[2]	✓ (S00, S0)	--	✓ (S00, S0)	--	--	--	• Enables fast connections • Permits vibration-resistant connections • Enables maintenance-free connections
Spring-type connection system for auxiliary circuits[2]	✓	✓	✓	✓	✓	✓	• Enables fast connections • Permits vibration-resistant connections • Enables maintenance-free connections
Ring terminal lug connection system for main and auxiliary circuits[2]	✓ (S00, S0)	--	--	--	--	--	• Enables fast connections • Permits vibration-resistant connections • Enables maintenance-free connections
Full starter functionality through IO-Link	--	--	--	--	--	✓	• 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	--	--	--	--	--	✓	• 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.

General data






Features	3RU21	3RU11	3RB30/3RB31	3RB20/3RB21	3RB22/3RB23	3RB24	Benefits
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	--	--	✓ (1:4)	✓ (1:4)	✓ (1:10)	✓ (1:10)	• 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	--	--	• Optimum motor protection for standard starts
Trip classes adjustable on the device CLASS 5E, 10E, 20E, 30E	--	--	3RB31: ✓	3RB21: ✓	✓	✓	• 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	--	--	✓	✓	✓	✓	• 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)]	✓	✓	--	--	• Eliminates the need for configuration and connecting an additional control circuit
Supplied from an external voltage through IO-Link	--	--	--	--	--	✓	• Eliminates the need for configuration and connecting an additional control circuit

✓ Available

-- Not available

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

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Features	3RU21	3RU11	3RB30/3RB31	3RB20/3RB21	3RB22/3RB23	3RB24	Benefits
Other characteristics (continued)							
Overload warning	--	--	--	--	✓	✓	• Indicates imminent tripping of the relay directly on the device due to overload, phase unbalance or phase failure through flickering of the LEDs or in the case of the 3RB24 as a signal through IO-Link • Allows the imminent tripping of the relay to be signaled • Allows measures to be taken in time in the event of inverse-time delayed overloading of the load for an extended period over the current limit • Eliminates the need for an additional device • Saves space in the control cabinet • Reduces wiring outlay and costs
Analog output	--	--	--	--	✓	✓	• Allows the output of an analog output signal for actuating moving-coil instruments, feeding programmable logic controllers or transfer to bus systems • Eliminates the need for an additional measuring transducer and signal converter • Saves space in the control cabinet • Reduces wiring outlay and costs

✓ Available
-- Not available

General data

Overview of overload relays – matching contactors

Overload relays	Current measure-ment	Current range	**Contactors** (type, size, rating in kW) **3RT201.**	**3RT202.**	**3RT203.**	**3RT104.**	**3RT105.**	**3RT106.**	**3RT107.**	**3TF68/3TF69**
			S00	S0	S2	S3	S6	S10	S12	S14
Type		A	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 3RU21 thermal overload relays										
 3RU21										
3RU211	Integrated	0.11 … 16	✓	--	--	--	--	--	--	--
3RU212	Integrated	1.8 … 40	--	✓	--	--	--	--	--	--
3RU213	Integrated	11 … 80	--	--	✓	--	--	--	--	--
SIRIUS 3RU11 thermal overload relays										
 3RU11										
3RU114	Integrated	18 … 100	--	--	--	✓	--	--	--	--
SIRIUS 3RB30 electronic overload relays[1]										
 3RB30										
3RB301	Integrated	0.1 … 16	✓	--	--	--	--	--	--	--
3RB302	Integrated	0.1 … 40	--	✓	--	--	--	--	--	--
3RB303	Integrated	12.5 … 80	--	--	✓	--	--	--	--	--
SIRIUS 3RB31 electronic overload relays[1]										
										
3RB311	Integrated	0.1 … 16	✓	--	--	--	--	--	--	--
3RB312	Integrated	0.1 … 40	--	✓	--	--	--	--	--	--
3RB313	Integrated	12.5 … 80	--	--	✓	--	--	--	--	--
SIRIUS 3RB20 electronic overload relays[1]										
 3RB20										
3RB204	Integrated	12.5 … 100	--	--	--	✓	--	--	--	--
3RB205	Integrated	50 … 200	--	--	--	--	✓	--	--	--
3RB206	Integrated	55 … 630	--	--	--	--	--	✓	✓	✓
3RB201 + 3UF18	Integrated	630 … 820	--	--	--	--	--	--	--	✓
SIRIUS 3RB21 electronic overload relays[1]										
 3RB21										
3RB214	Integrated	12.5 … 100	--	--	--	✓	--	--	--	--
3RB215	Integrated	50 … 200	--	--	--	--	✓	--	--	--
3RB216	Integrated	55 … 630	--	--	--	--	--	✓	✓	✓
3RB211 + 3UF18	Integrated	630 … 820	--	--	--	--	--	--	--	✓

✓ Can be used

-- Cannot be used

[1] "Technical specifications" for the use of overload relays with trip class ≥ CLASS 20 can be found in "Short-circuit protection with fuses for motor feeders", see Configuration Manuals

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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**
				S00	S0	S2	S3	S6	S10	S12	S14
	Type		A	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  3RB24	3RB2283/ 3RB2383/ 3RB2483+	3RB2906	0.3 … 25	✓	✓	--	--	--	--	--	--
		3RB2906	10 … 100	✓	✓	✓	✓	--	--	--	--
		3RB2956	20 … 200	--	✓	✓	✓	✓	--	--	--
		3RB2966	63 … 630	--	--	--	--	--	✓	✓	✓
		3RB2906 + 3UF18	630 … 820	--	--	--	--	--	--	--	✓

✓ 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

General data

Connection methods

3RU2 thermal overload relays

- Sizes S00 and S0:
  - Main and auxiliary circuit: Either screw terminals, spring-type terminals or ring terminal lug connections
- Size S2:
  - Main circuit: Screw terminals with box terminal
  - Auxiliary circuit: Either screw or spring-type terminals

3RU1 thermal overload relays

- Size S3:
  - Main circuit: Screw terminals
  - Auxiliary circuit: Either screw or spring-type terminals

3RB3 electronic overload relays

- Sizes S00 and S0:
  - Main and auxiliary circuit: Either screw or spring-type terminals
- Size S2:
  - Main circuit: Screw terminals with box terminal or as straight-through transformer
  - Auxiliary circuit: Either screw or spring-type terminals

3RB2 electronic overload relays

3RB20 and 3RB21 overload relays:

- Size S3:
  - Main circuit: Screw terminals with box terminal or as straight-through transformer
  - Auxiliary circuit: Either screw or spring-type terminals
- Size S6:
  - Main circuit: With busbar connection or as straight-through transformer
  - Auxiliary circuit: Either screw or spring-type terminals
- Sizes S10/S12:
  - Main circuit: With busbar connection
  - Auxiliary circuit: Either screw or spring-type terminals

3RB22 to 3RB24 evaluation modules:

- Screw or spring-type terminals

3RB29 current measuring modules:

- Up to size S3: Straight-through transformers
- As from size S6:
  - Main circuit: With busbar connection
  - Auxiliary circuit: Either screw or spring-type terminals


Screw terminals


Spring-type terminals


Ring terminal lug connections


Busbar connections


Straight-through transformers

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

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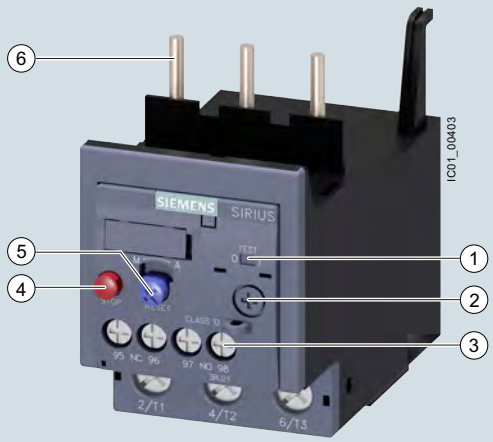
Overview



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

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

An overload or phase failure results in an increase of the motor current beyond the set rated motor current. Via heating elements, this current rise heats up the bimetal strips inside the device which then bend and as a result trigger the auxiliary contacts by means of a tripping mechanism. The auxiliary contacts then switch off the load by means of a contactor. The break time depends on the ratio between the tripping current and current setting I_e

The 3RU2 thermal overload relays are suitable for operation with frequency converters.

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

3RU11 overload relays for currents over 80 A in size S3, see page 7/111 onwards.

Use in hazardous areas

The 3RU21 thermal overload relays are suitable for the protection of motors with "Flameproof enclosure d" or "Increased safety e" types of protection.

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

SIRIUS 3RU2136-4.B0 thermal overload relay

Article No. scheme

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

Note:

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

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

Benefits

The most important features and benefits of the 3RU21 thermal overload relays are listed in the overview table (see "General Data", page 7/87 onwards).

Application

Industries

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

Application

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

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

Ambient conditions

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

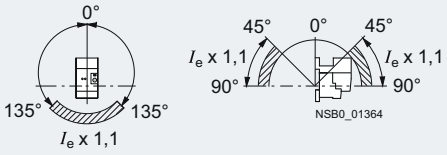
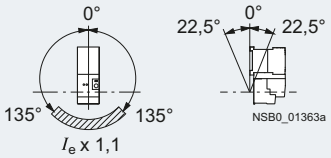
More information, see page 3.

Technical specifications

The following technical information is intended to provide an initial overview of the various types of device and functions.

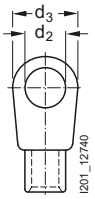
Type			**3RU2116**	**3RU2126**	**3RU2136**
Size			S00	S0	S2
Dimensions (W x H x D) (overload relay with stand-alone installation support)					
• Screw terminals		mm	45 x 89 x 80	45 x 97 x 95	55 x 105 x 117
• Spring-type terminals		mm	45 x 102 x 79	45 x 114 x 95	55 x 105 x 117
General data					
Trips in the event of			Overload and phase failure		
Trip class acc. to IEC 60947-4-1		Class	10		10, 10A
Phase failure sensitivity			Yes		
Overload warning			No		
Reset and recovery					
• Reset options after tripping			Manual, Automatic and Remote RESET (Remote RESET in combination with the corresponding accessories)		
• Recovery time					
- For automatic RESET		min.	Depends on the strength of the tripping current and characteristic		
- For manual RESET		min.	Depends on the strength of the tripping current and characteristic		
- For remote RESET		min.	Depends on the strength of the tripping current and characteristic		
Features					
• Display of operating state on device			Yes, by means of TEST function/switch position indicator slide		
• TEST function			Yes		
• RESET button			Yes		
• STOP button			Yes		
Protection and operation of motors with "Increased safety e" and "Flameproof enclosure d" types of protection					
EC type test certificate number according to directive 94/9/EC (ATEX)				x	On request

Type			3RU2116	3RU2126	3RU2136
Size			S00	S0	S2
Dimensions (W x H x D) (overload relay with stand-alone installation support)					
• Screw terminals		mm	45 x 89 x 80	45 x 97 x 95	55 x 105 x 117
• Spring-type terminals		mm	45 x 102 x 79	45 x 114 x 95	55 x 105 x 117
General data (continued)					
Ambient temperature					
• Storage/transport		°C	-55 ... +80		
• Operation		°C	-40 ... +70		
• Temperature compensation		°C	Up to +60		
• Permissible rated current at					
- Temperature inside control cabinet 60 °C		%	100 (over +60 °C current reduction is not required)		
- Temperature inside control cabinet 70 °C		%	87		
Repeat terminals					
• Coil repeat terminals			Yes	Not required	
• Auxiliary contact repeat terminal			Yes	Not required	
Degree of protection acc. to IEC 60529			IP20		
Touch protection acc. to IEC 61140					
• Screw terminals and spring-type terminals			Finger-safe for vertical contact from the front		
• Ring terminal lug connections			Finger-safe only with optional terminal covers		
Shock resistance with sine acc. to IEC 60068-2-27		*g*/ms	15/11 (auxiliary contacts 95/96 and 97/98: 8 *g*/11 ms)		
Electromagnetic compatibility (EMC)					
• Interference immunity			Not relevant		
• Emitted interference			Not relevant		
Resistance to extreme climates – air humidity		%	90		
Dimensions			"Dimensional drawings", see		

Installation altitude above sea level	m	Up to 2 000; above this on request
Mounting position		The diagrams show the permissible mounting positions for mounting onto contactors and stand-alone installation. For mounting position in the hatched area, a setting correction of 10 % must be implemented. Stand-alone installation:  Contactor + overload relay: 

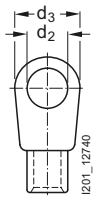
3RU2 up to 80 A for standard applications

Type		3RU2116	3RU2126	3RU2136
Size		S00	S0	S2
Main circuit				
Rated insulation voltage U_i (pollution degree 3)	V	690		
Rated impulse withstand voltage U_{imp}	kV	6		
Rated operational voltage U_e	V	690		
Type of current				
• Direct current		Yes		
• Alternating current		Yes, frequency range up to 400 Hz		
Current setting	A A	0.11 ... 0.16 up to 11 ... 16	1.8 ... 2.5 up to 34 ... 40	11 ... 16 up to 70 ... 80
Power loss per unit (max.)	W	4.1 ... 6.3	6.2 ... 7.5	8 ... 14
Short-circuit protection				
• With fuse without contactor		See "Selection and ordering data" on pages 7/100 ... 7/102		
• With fuse and contactor		"Short-Circuit Protection with Fuses/Motor Starter Protectors for Motor Feeders",		
Protective separation between main and auxiliary current paths acc. to IEC 60947-1				
• Screw terminals or ring terminal lug connections	V	440	690: Setting ranges ≤ 25 A	690
• Spring-type terminals	V	440	440: Setting ranges > 25 A	690
Conductor cross-sections of main circuit				
Connection type		**Screw terminals**		
Terminal screw		M3, Pozidriv size 2	M4, Pozidriv size 2	M6, Pozidriv size 2
Operating devices	mm	⌀ 5 ... 6	⌀ 5 ... 6	⌀ 5 ... 6
Prescribed tightening torque	Nm	0.8 ... 1.2	2 ... 2.5	3 ... 4.5
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected				
• Solid or stranded	mm^2	2 x (0.5 ... 1.5)[1], 2 x (0.75 ... 2.5)[1], max. 2 x 4	2 x (1 ... 2.5)[1], 2 x (2.5 ... 10)[1]	2 x (2.5 ... 35)[1], 1 x (2.5 ... 50)[1]
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (0.5 ... 1.5)[1], 2 x (0.75 ... 2.5)[1]	2 x (1 ... 2.5)[1], 2 x (2.5 ... 6)[1]; max. 1 x 10	2 x (1 ... 25)[1], 1 x (1 ... 35)[1]
• AWG cables, solid or stranded	AWG	2 x (20 ... 16)[1], 2 x (18 ... 14)[1], 2 x 12	2 x (16 ... 12)[1], 2 x (14 ... 8)[1]	2 x (18 ... 2)[1], 1 x (18 ... 1)[1]
Connection type		**Spring-type terminals**		
Operating devices	mm	3.0 x 0.5 and 3.5 x 0.5		
Conductor cross-sections (min./max.), 1 conductor can be connected				
• Solid or stranded	mm^2	1 x (0.5 ... 4)	1 x (1 ... 10)	--
• Finely stranded without end sleeve	mm^2	1 x (0.5 ... 2.5)	1 x (1 ... 6)	--
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	1 x (0.5 ... 2.5)	1 x (1 ... 6)	--
• AWG cables, solid or stranded	AWG	1 x (20 ... 12)	1 x (18 ... 8)	--
Connection type		**Ring terminal lug connections**		
Terminal screw		M3, Pozidriv size 2	M4, Pozidriv size 2	--
Operating devices	mm	⌀ 5 ... 6	⌀ 5 ... 6	--
Prescribed tightening torque	Nm	0.8 ... 1.2	2 ... 2.5	--
Usable ring terminal lugs	mm	d_2 = min. 3.2, d_3 = max. 7.5	d_2 = min. 4.3, d_3 = max. 12.2	--
• DIN 46234 without insulation sleeve				
• DIN 46225 without insulation sleeve				
• DIN 46237 with insulation sleeve				
• JIS C2805 Type R without insulation sleeve				
• JIS C2805 Type RAV with insulation sleeve				
• JIS C2805 Type RAP with insulation sleeve				



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

Type		3RU2116	3RU2126	3RU2136
Size		S00	S0	S2
Auxiliary circuit				
Number of NO contacts		1		
Number of NC contacts		1		
Auxiliary contacts – assignment		1 NO for the signal "tripped"; 1 NC for disconnecting the contactor		
Rated insulation voltage U_i (pollution degree 3)	V	690		
Rated impulse withstand voltage U_{imp}	kV	6		
Contact rating of the auxiliary contacts				
• NC, NO contact with alternating current AC-15, rated operational current I_e at U_e:				
- 24 V	A	3		
- 120 V	A	3		
- 125 V	A	3		
- 230 V	A	2		
- 400 V	A	1		
- 600 V	A	0.75		
- 690 V	A	0.75		
• NC contact, NO contact with direct current DC-13, rated operational current I_e at U_e:				
- 24 V	A	1		
- 110 V	A	0.22		
- 125 V	A	0.22		
- 220 V	A	0.11		
• Contact reliability (suitability for PLC control; 17 V, 5 mA)		Yes		
Short-circuit protection				
• With fuse				
- Operational class gG	A	6		
- Quick	A	10		
• With miniature circuit breaker (C characteristic)	A	6 (up to $I_k \leq 0.5$ kA; $U \leq 260$ V)		
Reliable operational voltage for protective separation between auxiliary current paths acc. to IEC 60947-1	V	440		
CSA, UL, UR rated data				
Auxiliary circuit – switching capacity		B600, R300		
Conductor cross-sections for auxiliary circuit				
Connection type		**Screw terminals**		
Terminal screw		M3, Pozidriv size 2		
Operating devices	mm	⌀ 5 ... 6		
Prescribed tightening torque	Nm	0.8 ... 1.2		
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected				
• Solid or stranded	mm^2	2 x (0.5 ... 1.5)[1], 2 x (0.75 ... 2.5)[1]		
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (0.5 ... 1.5)[1], 2 x (0.75 ... 2.5)[1]		
• AWG cables, solid or stranded	AWG	2 x (20 ... 16)[1], 2 x (18 ... 14)[1]		
Connection type		**Spring-type terminals**		
Operating devices	mm	3.0 x 0.5 and 3.5 x 0.5		
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected				
• Solid or stranded	mm^2	2 x (0.5 ... 2.5)		
• Finely stranded without end sleeve	mm^2	2 x (0.5 ... 2.5)		
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (0.5 ... 1.5)		
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)		
Connection type		**Ring terminal lug connections**		
Terminal screw		M3, Pozidriv size 2		--
Operating devices	mm	⌀ 5 ... 6		--
Prescribed tightening torque	Nm	0.8 ... 1.2		--
Usable ring terminal lugs	mm	d_2 = min. 3.2, d_3 = max. 7.5		--
• DIN 46234 without insulation sleeve				
• DIN 46225 without insulation sleeve				
• DIN 46237 with insulation sleeve				
• JIS C2805 Type R without insulation sleeve				
• JIS C2805 Type RAV with insulation sleeve				
• JIS C2805 Type RAP with insulation sleeve				



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

Selection and ordering data

3RU21 thermal overload relays for mounting onto contactor[1], sizes S00 and S0, CLASS 10

Features and technical specifications:

- Connection method
  Main and auxiliary circuit: Either screw terminals, spring-type terminals or ring terminal lug connections[2]
- Overload and phase failure protection
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Switch position indicator
- TEST function
- STOP button
- Sealable covers (optional accessory)
- Terminal covers for devices with ring terminal lug connection (optional accessory)

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


3RU2116-4AB0


3RU2116-4AC0


3RU2126-4FB0


3RU2126-4AC0

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

[1] With the suitable terminal supports (see "Accessories", page 7/103), the 3RU2 overload relays for mounting on contactors can also be installed as stand-alone units.

[2] When ordering the ring terminal lug version, the Article No. must be changed in the 10th digit to **"J"**: e.g. 3RU2116-0A**J**0.

[3]

Overload relays in size S2, see page 7/101.

3RU21 thermal overload relays for mounting onto contactor[1], size S2, CLASS 10

Features and technical specifications:

- Connection methods
  - Main circuit: Screw terminals with box terminal
  - Auxiliary circuit: Either screw or spring-type terminals
- Overload and phase failure protection
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Switch position indicator
- TEST function
- STOP button
- Sealable covers (optional accessory)

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


3RU2136-4.B0


3RU2136-4.D0

Size contactor	Trip class	Current setting value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", operational class gG[2]	DT	**Screw terminals**	DT	**Spring-type terminals** (on auxiliary current side)
					Article No. / Price per PU		Article No. / Price per PU
	Class	A	A				
Size S2							
S2	10	11 ... 16	40	NEW ▶	**3RU2136-4AB0**	X	**3RU2136-4AD0**
	10	14 ... 20	50	NEW ▶	**3RU2136-4BB0**	X	**3RU2136-4BD0**
	10	18 ... 25	63	NEW ▶	**3RU2136-4DB0**	X	**3RU2136-4DD0**
	10	22 ... 32	80	NEW ▶	**3RU2136-4EB0**	X	**3RU2136-4ED0**
	10	28 ... 40	80	NEW ▶	**3RU2136-4FB0**	X	**3RU2136-4FD0**
	10	36 ... 45	100	NEW ▶	**3RU2136-4GB0**	X	**3RU2136-4GD0**
	10	40 ... 50	100	NEW ▶	**3RU2136-4HB0**	X	**3RU2136-4HD0**
	10	47 ... 57	100	NEW ▶	**3RU2136-4QB0**	X	**3RU2136-4QD0**
	10	54 ... 65	125	NEW ▶	**3RU2136-4JB0**	X	**3RU2136-4JD0**
	10A	62 ... 73	160	NEW ▶	**3RU2136-4KB0**	X	**3RU2136-4KD0**
	10A	70 ... 80	160	NEW ▶	**3RU2136-4RB0**	X	**3RU2136-4RD0**

[1] With the suitable terminal supports (see "Accessories", page 7/103), the 3RU2 overload relays for mounting on contactors can also be installed as stand-alone units.

3RU2 up to 80 A for standard applications

3RU21 thermal overload relays for stand-alone installation, sizes S00 to S2, CLASS 10

Features and technical specifications:

- Connection methods
  - Sizes S00 and S0:
    Main and auxiliary circuit: Either screw or spring-type terminals
  - Size S2:
    Main circuit: Screw terminals with box terminal,
    main circuit: Either screw or spring-type terminals
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Switch position indicator
- TEST function
- STOP button
- Sealable covers (optional accessory)

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


3RU2116-4AC1


3RU2136-4.B1


3RU2126-4FB1


3RU2126-4FC1


3RU2136-4.D1

Size contactor	Trip class	Current setting value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", operational class gG[2]	DT	**Screw terminals**	DT	**Spring-type terminals**
					Article No. / Price per PU		Article No. / Price per PU
	Class	A	A				
Size S00							
S00	10	0.11 ... 0.16	0.5	B	**3RU2116-0AB1**	B	**3RU2116-0AC1**
	10	0.14 ... 0.2	1	B	**3RU2116-0BB1**	B	**3RU2116-0BC1**
	10	0.18 ... 0.25	1	B	**3RU2116-0CB1**	B	**3RU2116-0CC1**
	10	0.22 ... 0.32	1.6	B	**3RU2116-0DB1**	B	**3RU2116-0DC1**
	10	0.28 ... 0.4	2	B	**3RU2116-0EB1**	B	**3RU2116-0EC1**
	10	0.35 ... 0.5	2	B	**3RU2116-0FB1**	B	**3RU2116-0FC1**
	10	0.45 ... 0.63	2	B	**3RU2116-0GB1**	B	**3RU2116-0GC1**
	10	0.55 ... 0.8	4	B	**3RU2116-0HB1**	B	**3RU2116-0HC1**
	10	0.7 ... 1	4	B	**3RU2116-0JB1**	B	**3RU2116-0JC1**
	10	0.9 ... 1.25	4	B	**3RU2116-0KB1**	B	**3RU2116-0KC1**
	10	1.1 ... 1.6	6	B	**3RU2116-1AB1**	B	**3RU2116-1AC1**
	10	1.4 ... 2	6	B	**3RU2116-1BB1**	B	**3RU2116-1BC1**
	10	1.8 ... 2.5	10	B	**3RU2116-1CB1**	B	**3RU2116-1CC1**
	10	2.2 ... 3.2	10	B	**3RU2116-1DB1**	B	**3RU2116-1DC1**
	10	2.8 ... 4	16	B	**3RU2116-1EB1**	B	**3RU2116-1EC1**
	10	3.5 ... 5	20	B	**3RU2116-1FB1**	B	**3RU2116-1FC1**
	10	4.5 ... 6.3	20	B	**3RU2116-1GB1**	B	**3RU2116-1GC1**
	10	5.5 ... 8	25	B	**3RU2116-1HB1**	B	**3RU2116-1HC1**
	10	7 ... 10	35	B	**3RU2116-1JB1**	B	**3RU2116-1JC1**
	10	9 ... 12.5	35	B	**3RU2116-1KB1**	B	**3RU2116-1KC1**
	10	11 ... 16	40	B	**3RU2116-4AB1**	B	**3RU2116-4AC1**
Size S0							
S0	10	14 ... 20	50	B	**3RU2126-4BB1**	B	**3RU2126-4BC1**
	10	17 ... 22	63	B	**3RU2126-4CB1**	B	**3RU2126-4CC1**
	10	20 ... 25	63	B	**3RU2126-4DB1**	B	**3RU2126-4DC1**
	10	23 ... 28	63	B	**3RU2126-4NB1**	B	**3RU2126-4NC1**
	10	27 ... 32	80	B	**3RU2126-4EB1**	B	**3RU2126-4EC1**
	10	30 ... 36	80	B	**3RU2126-4PB1**	B	**3RU2126-4PC1**
	10	34 ... 40	80	B	**3RU2126-4FB1**	B	**3RU2126-4FC1**
Size S2							
S2	10	22 ... 32	80	NEW ▶	**3RU2136-4EB1**	▶	**3RU2136-4ED1**
	10	28 ... 40	80	NEW ▶	**3RU2136-4FB1**	▶	**3RU2136-4FD1**
	10	36 ... 45	100	NEW ▶	**3RU2136-4GB1**	▶	**3RU2136-4GD1**
	10	40 ... 50	100	NEW ▶	**3RU2136-4HB1**	▶	**3RU2136-4HD1**
	10	47 ... 57	100	NEW ▶	**3RU2136-4QB1**	▶	**3RU2136-4QD1**
	10	54 ... 65	125	NEW ▶	**3RU2136-4JB1**	▶	**3RU2136-4JD1**
	10A	62 ... 73	160	NEW ▶	**3RU2136-4KB1**	▶	**3RU2136-4KD1**
	10A	70 ... 80	160	NEW ▶	**3RU2136-4RB1**	▶	**3RU2136-4RD1**

[1] 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.

Overview

Overload relays for standard applications

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

- Size-specific terminal support for stand-alone installation, in sizes S00 and S0 also with spring-type terminals
- Mechanical RESET (for all sizes)
- Cable release for resetting devices which are difficult to access (for all sizes)
- Electrical remote RESET module in three voltage variants (for all sizes)
- Sealable cover (for all sizes)
- Terminal covers for devices with screw terminals (box terminals) and ring terminal lug connections

Selection and ordering data

Version	Size	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Terminal supports for stand-alone installation							
 3RU2916-3AA01	**Terminal supports for overload relays with screw terminals**		**Screw terminals**				
	For separate mounting of the overload relays; screw and snap-on mounting onto standard mounting rail	S00	▶	**3RU2916-3AA01**		1	1 unit	41F
		S0	▶	**3RU2926-3AA01**		1	1 unit	41F
		S2 NEW	A	**3RU2936-3AA01**		1	1 unit	41F
 3RU2926-3AA01	**Terminal supports for overload relays with spring-type terminals**		**Spring-type terminals**				
	For separate mounting of the overload relays; screw and snap-on mounting onto standard mounting rail	S00	B	**3RU2916-3AC01**		1	1 unit	41F
		S0	B	**3RU2926-3AC01**		1	1 unit	41F
 3RU2936-3AA01							
 3RU2916-3AC01							
 3RU2926-3AC01							
Mechanical RESET							
 3RU2900-1A with pushbutton and extension plunger	**Resetting plungers, holders and formers**	S00 ... S2	▶	**3RU2900-1A**		1	1 unit	41F
	Pushbuttons with extended stroke (12 mm), IP65, ⌀ 22 mm	S00 ... S2	B	**3SB3000-0EA11**		1	1 unit	41J
	Extension plungers For compensation of the distance between the pushbutton and the unlatching button of the relay	S00 ... S2	A	**3SX1335**		1	1 unit	41J

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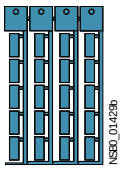
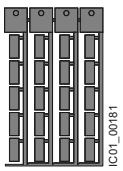
Accessories

	Version	Size	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Cable releases with holder for RESET								
 3RU2900-1.	For ⌀ 6.5 mm holes in the control panel; max. control panel thickness 8 mm							
	• Length 400 mm	S00 ... S2	►	**3RU2900-1B**		1	1 unit	41F
	• Length 600 mm	S00 ... S2	►	**3RU2900-1C**		1	1 unit	41F
Modules for remote RESET, electrical								
 3RU1900-2A.71	Operating range 0.85 ... 1.1 × U_S, power consumption AC 80 VA, DC 70 W, ON period 0.2 ... 4 s, switching frequency 60/h							
	• 24 ... 30 V AC/DC	S00 ... S2	A	**3RU1900-2AB71**		1	1 unit	41F
	• 110 ... 127 V AC/DC	S00 ... S2	A	**3RU1900-2AF71**		1	1 unit	41F
	• 220 ... 250 V AC/DC	S00 ... S2	A	**3RU1900-2AM71**		1	1 unit	41F
Sealable covers								
 3RV2908-0P	For covering the setting knobs	S00 ... S2	►	**3RV2908-0P**		100	10 units	41E
Terminal covers								
 3RT2936-4EA2	**Covers for devices with screw terminals (box terminals)** Additional touch protection for fastening to the box terminals			**Screw terminals**				
	• Main current level	S2 NEW	B	**3RT2936-4EA2**		1	1 unit	41B
 3RU2916-3BJ21	**Covers for devices with ring terminal lug connection** (ensure finger-safety)			**Ring terminal lug connection**				
	• Main current level							
	- Cover between contactor and overload relay for direct mounting of the overload relay	S00 S0	C C	**3RU2916-3BJ21** **3RU2926-3BJ21**		1 1	10 units 10 units	41F 41F
 3RU2926-3BJ21	- Cover for overload relay on load side	S00 S0	C B	**3RU2916-3BJ20** **3RV2928-4AA00**		1 1	10 units 1 unit	41F 41E
 3RU2916-3BJ20	• Auxiliary current level	S00, S0	B	**3RT2916-4EA13**		1	10 units	41B
 3RV2928-4AA00								
 3RT2916-4EA13								

General accessories

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

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

More information

Manuals

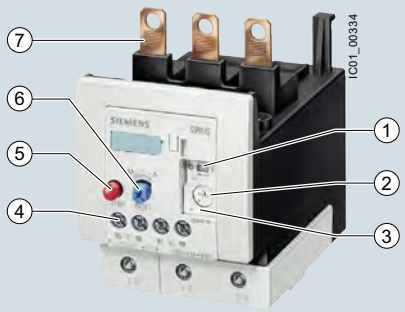
- System Manual "SIRIUS Innovations – System Overview"
- Manual "SIRIUS Innovations – SIRIUS 3RU2/3RB3 Overload Relays"

Overview

Note:

The 3RU11 devices (sizes S00/S0 to S3) can be found

- in the Catalog Add-On IC 10 AO · 2015 at the Information and Download Center
- in the interactive catalog CA 01
- in the Industry Mall



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

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

(3) Transparent, sealable cover:
Secures the motor current setting and the TEST function against adjustment.

(4) Connecting terminals:
The generously sized terminals permit connection of two conductors with different cross-sections for main and auxiliary circuits. The auxiliary circuit can be connected with screw terminals and alternatively with spring-type terminals.

(5) STOP button:
If the STOP button is pressed, the NC contact is opened. This switches off the contactor downstream. The NC contact is closed again when the button is released.

(6) Selector switch for manual/automatic RESET and RESET button:
With this switch you can choose between manual and automatic RESET. A device set to manual RESET can be reset locally by pressing the RESET button. A remote RESET is possible using the RESET modules (accessories), which are independent of size.

(7) Connection for mounting onto contactors:
Optimally adapted in electrical, mechanical and design terms to the contactors. These connecting pins can be used for direct mounting of the overload relay to the contactor. Stand-alone installation is possible as an alternative (partly in conjunction with a terminal support for stand-alone installation).

SIRIUS 3RU1146-1HB0 thermal overload relay

The 3RU11 thermal overload relays up to 100 A have been designed for inverse-time delayed protection of loads with normal starting ("Function", against excessive temperature rises due to overload or phase failure.

An overload or phase failure results in an increase of the motor current beyond the set rated motor current. Via heating elements, this current rise heats up the bimetal strips inside the device which then bend and as a result trigger the auxiliary contacts by means of a tripping mechanism. The auxiliary contacts then switch off the load by means of a contactor. The break time depends on the ratio between the tripping current and current setting I_e

The "tripped" status is signaled by means of a switch position indicator. Resetting takes place either manually or automatically after a recovery time has elapsed ("Function",

The 3RU11 thermal overload relays are suitable for operation with frequency converters. Please follow the instructions in the Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays",

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

They comply with all important worldwide standards and approvals.

3RU21 overload relays in sizes S00 to S2, see page 7/100 onwards.

Use in hazardous areas

The 3RU11 thermal overload relays are suitable for the protection of motors with "Flameproof enclosure d" or "Increased safety e" types of protection.

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

Article No. scheme

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

Note:

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

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

Benefits

The most important features and benefits of the 3RU11 thermal overload relays are listed in the overview table (see "General Data", page 7/87 onwards).

Application

Industries

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

Application

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

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

Ambient conditions

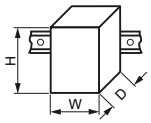
The 3RU11 thermal overload relays have temperature compensation in accordance with IEC 60947-4-1 for the temperature range of -20 to +60 °C. For temperatures from +60 to +70 °C, the upper set value of the setting range must be reduced by the factor listed in the table below.

Technical specifications

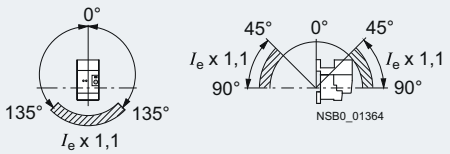
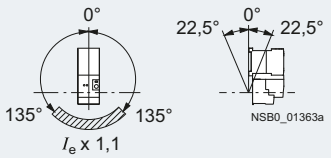
The following technical information is intended to provide an initial overview of the various types of device and functions.

Type		**3RU1146**
Size		S3
Dimensions (W x H x D) (overload relay with stand-alone installation support)	mm	70 x 120 x 140
General data		
Trips in the event of		Overload and phase failure
Trip class acc. to IEC 60947-4-1	CLASS	10
Phase failure sensitivity		Yes
Overload warning		No
Reset and recovery		
• Reset options after tripping		Manual, Automatic and Remote RESET (Remote RESET in combination with the corresponding accessories)
• Recovery time		
- For automatic RESET	min.	Depends on the strength of the tripping current and characteristic
- For manual RESET	min.	Depends on the strength of the tripping current and characteristic
- For remote RESET	min.	Depends on the strength of the tripping current and characteristic
Features		
• Display of operating state on device		Yes, by means of TEST function/switch position indicator slide
• TEST function		Yes
• RESET button		Yes
• STOP button		Yes
Protection and operation of motors with "Increased safety e" and "Flameproof enclosure d" types of protection		
EC type test certificate number according to directive 94/9/EC (ATEX)		DMT 98 ATEX G 001 Ex II (2) GD,
Ambient temperature		
• Storage/transport	°C	-55 ... +80
• Operation	°C	-20 ... +70
• Temperature compensation	°C	up to 60
• Permissible rated current at		
- Temperature inside control cabinet 60 °C	%	100 (over +60 °C current reduction is not required)
- Temperature inside control cabinet 70 °C	%	87
Repeat terminals		
• Coil repeat terminals		Not required
• Auxiliary contact repeat terminal		Not required

3RU11 up to 100 A for standard applications

Type			**3RU1146**
Size			S3
Dimensions (W x H x D) (overload relay with stand-alone installation support)		mm	70 x 120 x 140

General data (continued)

Degree of protection acc. to IEC 60529		IP20 (terminal compartment: IP00 degree of protection)
Touch protection acc. to IEC 61140		Finger-safe for vertical contact from the front
Shock resistance with sine acc. to IEC 60068-2-27	*g*/ms	8/10
Electromagnetic compatibility (EMC)		
• Interference immunity		Not relevant
• Emitted interference		Not relevant
Resistance to extreme climates – air humidity	%	100
Dimensions		"Dimensional drawings", see
Installation altitude above sea level	m	Up to 2 000; above this on request
Mounting position		The diagrams show the permissible mounting positions for mounting onto contactors and stand-alone installation. For mounting position in the hatched area, a setting correction of 10 % must be implemented. Stand-alone installation:  Contactor + overload relay: 
Type of mounting		Direct mounting/stand-alone installation with terminal support (For screw and snap-on mounting onto TH 35 standard mounting rail; size S3 also for TH 75 standard mounting rail.

Type		**3RU1146**
Size		S3
Main circuit		
Rated insulation voltage U_i (pollution degree 3)	V	1 000
Rated impulse withstand voltage U_{imp}	kV	8
Rated operational voltage U_e	V	1 000
Type of current		
• Direct current		Yes
• Alternating current		Yes, frequency range up to 400 Hz
Current setting	A	18 ... 25 up to 80 ... 100
Power loss per unit (max.)	W	10 ... 16.5
Short-circuit protection		
• With fuse without contactor		See "Selection and ordering data" on page 7/111
• With fuse and contactor		See Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload "Technical Specifications" → "Short-circuit protection with fuses/motor starter protectors for motor feeders".
Protective separation between main and auxiliary current paths acc. to IEC 60947-1	V	690
Conductor cross-section of the main circuit		
Connection type		**Screw terminals with box terminal**
Terminal screw		M8, 4 mm Allen screw
Operating devices	mm	4 mm Allen screw
Prescribed tightening torque	Nm	4 ... 6
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected		
• Solid	mm^2	2 x (2.5 ... 16)
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (2.5 ... 35)[1], 1 x (2.5 ... 50)[1]
• Stranded	mm^2	2 x (10 ... 50)[1], 1 x (10 ... 70)[1]
• AWG cables, solid or stranded	AWG	2 x (10 ... 1/0)[1], 1 x (10 ... 2/0)[1]
• Ribbon cable conductors (Number x Width x Thickness)	mm	2 x (6 x 9 x 0.8)
Connection type		**Busbar connection**[2]
Terminal screw		M6 x 20
Prescribed tightening torque	Nm	4 ... 6
Conductor cross-sections (min./max.)		
• Finely stranded with cable lug	mm^2	2 x 70
• Stranded with cable lug	mm^2	3 x 70
• AWG cables, solid or stranded, with cable lug	AWG	2/0
• With connecting bars (max. width)	mm	12

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

[2] The box terminal is removable. Rail and cable lug connections are possible if the box terminal is removed.

3RU11 up to 100 A for standard applications

Type		**3RU1146**
Size		S3
Auxiliary circuit		
Number of NO contacts		1
Number of NC contacts		1
Auxiliary contacts – assignment		1 NO for the signal "tripped"; 1 NC for disconnecting the contactor
Rated insulation voltage U_i (pollution degree 3)	V	690
Rated impulse withstand voltage U_{imp}	kV	6
Contact rating of the auxiliary contacts		
• NC contact with alternating current AC-14/AC-15, rated operational current I_e at U_e:		
- 24 V	A	4
- 120 V	A	4
- 125 V	A	4
- 230 V	A	3
- 400 V	A	2
- 600 V	A	0.6
- 690 V	A	0.5
• NO contact with alternating current AC-14/AC-15, rated operational current I_e at U_e:		
- 24 V	A	3
- 120 V	A	3
- 125 V	A	3
- 230 V	A	2
- 400 V	A	1
- 600 V	A	0.6
- 690 V	A	0.5
• NC contact, NO contact with direct current DC-13, rated operational current I_e at U_e:		
- 24 V	A	1
- 60 V	A	On request
- 110 V	A	0.22
- 125 V	A	0.22
- 220 V	A	0.11
• Conventional thermal current I_{th}	A	6
• Contact reliability (suitability for PLC control; 17 V, 5 mA)		Yes
Short-circuit protection		
• With fuse		
- Operational class gG	A	6
- Quick	A	10
• With miniature circuit breaker (C characteristic)	A	6[1]
Protective separation between auxiliary current paths acc. to IEC 60947-1	V	440
CSA, UL, UR rated data		
Auxiliary circuit – switching capacity		B600, R300
Conductor cross-sections of the auxiliary circuit		
Connection type		**Screw terminals**
Terminal screw		M3, Pozidriv size 2
Operating devices	mm	⌀ 5 ... 6
Prescribed tightening torque	Nm	0.8 ... 1.2
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected		
• Solid	mm^2	2 x (0.5 ... 1.5)[2], 2 x (0.75 ... 2.5)[2]
• Finely stranded without end sleeve	mm^2	--
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (0.5 ... 1.5)[2], 2 x (0.75 ... 2.5)[2]
• Stranded	mm^2	2 x (0.5 ... 1.5)[2], 2 x (0.75 ... 2.5)[2]
• AWG cables, solid or stranded	AWG	2 x (18 ... 14)
Connection type		**Spring-type terminals**
Operating devices	mm	3.0 x 0.5 and 3.5 x 0.5
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected		
• Solid or stranded	mm^2	2 x (0.5 ... 2.5)
• Finely stranded without end sleeve	mm^2	2 x (0.5 ... 2.5)
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (0.5 ... 1.5)
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)

[1] Up to $I_k \leq 0.5$ kA; ≤ 260 V.

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

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تهران، کیلومتر۲۱ بزرگراه لشگری (جاده مخصوص کرج)
روبروی پالایشگاه نفت پارس، پلاک ۱۲

Selection and ordering data

Features and technical specifications:

- Connection methods
  - Main circuit: Screw terminals
  - Auxiliary circuit: Either screw or spring-type terminals
- Tripping class CLASS 10
- Overload and phase failure protection
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Switch position indicator
- TEST function
- STOP button
- Integrated sealable cover

3RU11 thermal overload relays with screw terminals on the auxiliary current side, CLASS 10

Size contactor	Trip class	Current setting value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", operational class gG[1]	DT	**Screw terminals** (on auxiliary current side) Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	CLASS	A	A						
Size S3									
For mounting onto contactor[2]									
S3	10	18 ... 25	63	▶	**3RU1146-4DB0**		1	1 unit	41F
	10	22 ... 32	80	▶	**3RU1146-4EB0**		1	1 unit	41F
	10	28 ... 40	80	▶	**3RU1146-4FB0**		1	1 unit	41F
	10	36 ... 50	125	▶	**3RU1146-4HB0**		1	1 unit	41F
	10	45 ... 63	125	▶	**3RU1146-4JB0**		1	1 unit	41F
	10	57 ... 75	160	▶	**3RU1146-4KB0**		1	1 unit	41F
	10	70 ... 90	160	▶	**3RU1146-4LB0**		1	1 unit	41F
	10	80 ... 100[3]	200	▶	**3RU1146-4MB0**		1	1 unit	41F
For stand-alone installation									
S3	10	45 ... 63	125	▶	**3RU1146-4JB1**		1	1 unit	41F
	10	57 ... 75	160	▶	**3RU1146-4KB1**		1	1 unit	41F
	10	70 ... 90	160	▶	**3RU1146-4LB1**		1	1 unit	41F
	10	80 ... 100[3]	200	▶	**3RU1146-4MB1**		1	1 unit	41F


3RU1146-..B0


3RU1146-4JB1

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

2) With the appropriate terminal supports (see "Accessories", page 7/112), the 3RU11 overload relays for mounting onto contactors can also be installed as stand-alone units.

3) For overload relays > 100 A, see 3RB2 electronic overload relays, page 7/130 onwards.

3RU11 thermal overload relays with screw terminals, CLASS 10

Size contactor	Trip class	Current setting value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", operational class gG[1]	DT	**Spring-type terminals** (on auxiliary current side) Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	CLASS	A	A						
Size S3[2]									
For mounting onto contactor[3]									
S3	10	18 ... 25	63	B	**3RU1146-4DD0**		1	1 unit	41F
	10	22 ... 32	80	B	**3RU1146-4ED0**		1	1 unit	41F
	10	28 ... 40	80	B	**3RU1146-4FD0**		1	1 unit	41F
	10	36 ... 50	125	B	**3RU1146-4HD0**		1	1 unit	41F
	10	45 ... 63	125	▶	**3RU1146-4JD0**		1	1 unit	41F
	10	57 ... 75	160	▶	**3RU1146-4KD0**		1	1 unit	41F
	10	70 ... 90	160	▶	**3RU1146-4LD0**		1	1 unit	41F
	10	80 ... 100	200	▶	**3RU1146-4MD0**		1	1 unit	41F


3RU1146-..D0

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

3) With the appropriate terminal supports (see "Accessories", page 7/112), the 3RU11 overload relays for mounting onto contactors can also be installed as stand-alone units.

Overview

Overload relays for standard applications

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

- Terminal supports for stand-alone installation for the overload relays
- Mechanical RESET (for all sizes)
- Cable release for resetting devices which are difficult to access (for all sizes)
- Electrical remote RESET module in three voltage variants (for all sizes)
- Terminal covers

Technical specifications

Terminal supports for stand-alone installation

Type		**3RU1946-3AA01**
For overload relays		**3RU1146**
Mounting type		For screw and snap-on mounting onto TH 35 and TH 75 standard mounting rails
Connection for main circuit		
Connection type		**Screw terminals with box terminal**
Terminal screw	mm	4 mm Allen screw
Operating devices	mm	4 mm Allen screw
Prescribed tightening torque	Nm	4 ... 6
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected		
• Solid or stranded	mm^2	2 x (2.5 ... 16)
• Finely stranded without end sleeve	mm^2	--
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (2.5 ... 35)[1], 1 x (2.5 ... 50)[1]
• Stranded	mm^2	2 x (10 ... 50)[1], 1 x (10 ... 70)[1]
• AWG cables, solid or stranded	AWG	2 x (10 ... 1/0)[1], 1 x (10 ... 2/0)[1]
• Ribbon cable conductors (Number x Width x Thickness)	mm	2 x (6 x 9 x 0.8)

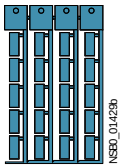
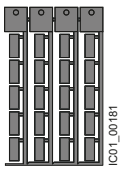
[1] If two different conductor cross-sections are connected to one clamping point, both cross-sections must be in the range specified.

Selection and ordering data

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

Version	Size	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Cable releases with holder for RESET							
 3RU1900-1. For ⌀ 6.5 mm holes in the control panel; max. control panel thickness 8 mm							
• Length 400 mm	S3	▶	**3RU1900-1B**		1	1 unit	41F
• Length 600 mm	S3	▶	**3RU1900-1C**		1	1 unit	41F
Modules for remote RESET, electrical							
 3RU1900-2A.71 Operating range 0.85 ... 1.1 × U_S, power consumption AC 80 VA, DC 70 W, ON period 0.2 ... 4 s, switching frequency 60/h							
• 24 ... 30 V AC/DC	S3	A	**3RU1900-2AB71**		1	1 unit	41F
• 110 ... 127 V AC/DC	S3	A	**3RU1900-2AF71**		1	1 unit	41F
• 220 ... 250 V AC/DC	S3	A	**3RU1900-2AM71**		1	1 unit	41F
Terminal covers							
Covers for cable lugs and busbar connections							
• Length 55 mm	S3	B	**3RT1946-4EA1**		1	1 unit	41B
Covers for box terminals							
• Length 20.8 mm	S3	▶	**3RT1946-4EA2**		1	1 unit	41B

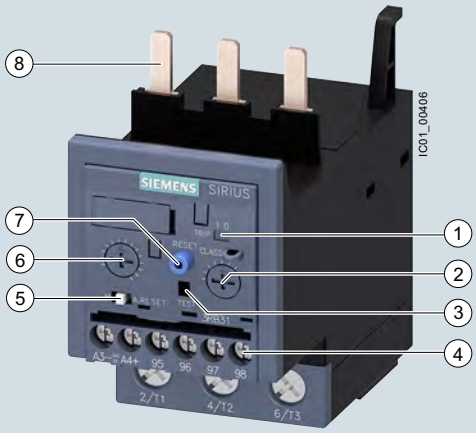
General accessories

Version	Size	Color	For overload relays	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Tools for opening spring-type terminals									
					Spring-type terminals				
 3RA2908-1A **Screwdrivers** For all SIRIUS devices with spring-type terminals	Length approx. 200 mm, 3.0 mm x 0.5 mm	Titanium gray/ black, partially insulated	Main and auxiliary circuit connection: 3RU1	A	**3RA2908-1A**		1	1 unit	41B
Blank labels									
 3RT1900-1SB20 **Unit labeling plates**[1] for SIRIUS devices	20 mm x 7 mm	Pastel turquoise	3RU1	D	**3RT1900-1SB20**		100	340 units	41B
	20 mm x 7 mm	Titanium gray	3RU1	D	**3RT2900-1SB20**		100	340 units	41B
Adhesive inscription labels[1]	19 mm x 6 mm	Pastel turquoise	3RU1	C	**3RT1900-1SB60**		100	3 060 units	41B
 3RT2900-1SB20 for SIRIUS devices	19 mm x 6 mm	Zinc yellow	3RU1	C	**3RT1900-1SD60**		100	3 060 units	41B

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

3RB30, 3RB31 up to 80 A for standard applications

Overview



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

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

SIRIUS 3RU3133-4.B0 electronic overload relay

The 3RB30/3RB31 electronic overload relays up to 80 A with internal power supply have been designed for inverse-time delayed protection of loads with normal and heavy starting (for "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 rated motor current. This current rise is detected by the current transformers integrated into the devices and evaluated by corresponding solid-state circuits which then output a pulse to the auxiliary contacts. The auxiliary contacts then switch off the load by means of a contactor. The break time depends on the ratio between the tripping current and current setting I

In addition to inverse-time delayed protection of loads against excessive temperature rises due to overload, phase unbalance and phase failure, the 3RB31 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 ("Function",

The 3RB3 electronic overload relays are suitable for operation with frequency converters. Please follow the instructions in the manual "SIRIUS Innovations – 3RU2/3RB3 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.

3RB20 and 3RB21 overload relays in sizes S2 to S10/S12, see page 7/130 onwards.

Use in hazardous areas

The 3RB30/3RB31 electronic overload relays are suitable for the overload protection of motors with the following types of protection:

- Ex II (2) G [Ex e] [Ex d] [Ex px]
- Ex II (2) D [Ex t] [Ex p]

EC type test certificate for Group II, Category (2) G/D exists. It has the number PTB 09 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 3rd generation		**3**								
Device series			□							
Size, rated operational current and power				□						
Version of the automatic RESET, electrical remote RESET					□					
Trip class (CLASS)							□			
Setting range of the overload release								□		
Connection methods									□	
Installation type										□
Example	**3 R B**	**3**	**0**	**1**	**6**	**–**	**1**	**R**	**B**	**0**

Note:

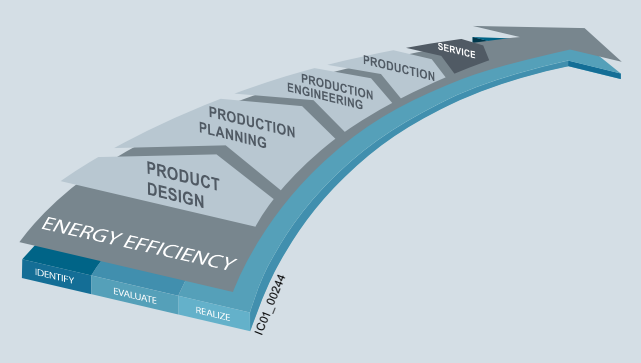
The Article No. scheme is presented here merely for information purposes and for better understanding of the logic behind the article numbers.

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

Benefits

The most important features and benefits of the 3RB30/3RB31 electronic overload relays are listed in the overview table (see "General Data" on page 7/87).

Advantages through energy efficiency



Overview of the energy management process

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

The innovative products of the SIRIUS industrial controls portfolio can also make a substantial contribution to a plant's energy efficiency.

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

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

Application

Industries

The 3RB30/3RB31 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 5E to 30E), minimize project completion times, inventories and energy consumption, and optimize plant availability and maintenance management.

Application

The 3RB30/3RB31 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 3RU21 thermal overload relay or the 3RB22/3RB23 solid-state overload relay can be used for single-phase AC loads. For DC loads we recommend the 3RU21 thermal overload relay.

Ambient conditions

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

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

Technical specifications

The following technical information is intended to provide an initial overview of the various types of device and functions.

Detailed information, see

Type		**3RB301., 3RB311.**	**3RB302., 3RB312.**	**3RB3036, 3RB3133**
Size		S00	S0	S2
Dimensions (W x H x D) (overload relay with stand-alone installation support)				
• Screw terminals	mm	45 x 89 x 80	45 x 97 x 94	55 x 105 x 117
• Spring-type terminals	mm	45 x 102 x 80	45 x 116 x 95	55 x 105 x 117
General data				
Trips in the event of		Overload, phase failure, and phase unbalance + ground fault (for 3RB31 only)		
Trip class acc. to IEC 60947-4-1	CLASS	3RB30: 10E, 20E; 3RB31: 5E, 10E, 20E or 30E adjustable		
Phase failure sensitivity		Yes		
Reset and recovery				
• Reset options after tripping		Manual and automatic RESET, 3RB31 has an integrated connection for electrical remote RESET (24 V DC)		
• Recovery time				
- For automatic RESET		Approx. 3 min		
- For manual RESET		Immediately		
- For remote RESET		Immediately		
Features				
• Display of operating state on device		Yes, by means of switch position indicator slide		
• TEST function		Yes, test of electronics by pressing the TEST button/ test of auxiliary contacts and wiring of control circuit by actuating the switch position indicator slide/self-monitoring		
• RESET button		Yes		
• STOP button		No		
Protection and operation of explosion-proof motors				
EC type test certificate number according to directive 94/9/EC (ATEX)		PTB 09 ATEX 3001 Ex II (2) G [Ex e] [Ex d] [Ex px] Ex II (2) G [Ex t] [Ex p]		On request
Ambient temperatures				
• Storage/transport	°C	-40 ... +80		
• Operation	°C	-25 ... +60		
• Temperature compensation	°C	+60		
• Permissible rated current at				
- Temperature inside control cabinet 60 °C	%	100		
- Temperature inside control cabinet 70 °C	%	On request		
Repeat terminals				
• Coil repeat terminals		Yes	Not required	
• Auxiliary contact repeat terminal		Yes	Not required	
Degree of protection acc. to IEC 60529		IP20		
Touch protection acc. to IEC 61140		Finger-safe for vertical contact from the front		
Shock resistance with sine acc. to IEC 60068-2-27	*g*/ms	15/11 (signaling contact 97/98 in "Tripped" position: 9 *g*/11 ms)		15/11 (signaling contact 97/98 in "Tripped" position: 8 *g*/11 ms)
Electromagnetic compatibility (EMC) – Interference immunity				
• Conductor-related interference				
- Burst acc. to IEC 61000-4-4 (corresponds to degree of severity 3)	kV	2 (power ports), 1 (signal ports)		
- Surge acc. to IEC 61000-4-5 (corresponds to degree of severity 3)	kV	2 (line to earth), 1 (line to line)		
• Electrostatic discharge according to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	8 (air discharge), 6 (contact discharge)		
• Field-related interference acc. to IEC 61000-4-3 (corresponds to degree of severity 3)	V/m	10		
Electromagnetic compatibility (EMC) – emitted interference		Degree of severity B acc. to EN 55011 (CISPR 11) and EN 55022 (CISPR 22)		
Resistance to extreme climates – air humidity	%	95		

Type		3RB301., 3RB311.	3RB302., 3RB312.	3RB3036, 3RB3133
Size		S00	S0	S2
Dimensions (W x H x D) (overload relay with stand-alone installation support)				
• Screw terminals	mm	45 x 89 x 80	45 x 97 x 94	55 x 105 x 117
• Spring-type terminals	mm	45 x 102 x 80	45 x 116 x 95	55 x 105 x 117

General data (continued)

Dimensions		"Dimensional drawings", see • Manual "SIRIUS Innovations – SIRIUS 3RU2/3RB3 Overload Relays",
Installation altitude above sea level	m	Up to 2 000
Mounting position		Any
Type of mounting		Direct mounting/stand-alone installation with terminal support

Type		3RB301., 3RB311.	3RB302., 3RB312.	3RB3036, 3RB3133
Size		S00	S0	S2
Main circuit				
Rated insulation voltage U_i (pollution degree 3)	V	690		
Rated impulse withstand voltage U_{imp}	kV	6		
Rated operational voltage U_e	V	690		
Type of current				
• Direct current		No		
• Alternating current		Yes, 50/60 Hz ± 5 %		
Current setting	A	0.1 ... 0.4	0.1 ... 0.4	12.5 ... 50
		up to	up to	and
	A	4 ... 16	10 ... 40	20 to 80
Power loss per unit (max.)	W	0.05 ... 0.2		
Short-circuit protection				
• With fuse without contactor		See "Selection and ordering data" on pages 7/119 to 7/121		
• With fuse and contactor		"Short-Circuit Protection with Fuses/Motor Starter Protectors for Motor		
Protective separation between main and auxiliary current paths acc. to IEC 60947-1 (pollution degree 2)				
• For systems with grounded neutral point	V	690		
• For systems with ungrounded neutral point	V	600		
Conductor cross-sections of main circuit				
Connection type		**Screw terminals**		
Terminal screw		M3, Pozidriv size 2	M4, Pozidriv size 2	
Operating devices	mm	⌀ 5 ... 6	⌀ 5 ... 6	
Prescribed tightening torque	Nm	0.8 ... 1.2	2 ... 2.5	
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected				
• Solid or stranded	mm^2	2 x (0.5 ... 1.5)[1], 2 x (0.75 ... 2.5)[1], 2 x (0.5 ... 4)[1]	2 x (1 ... 2.5)[1], 2 x (2.5 ... 10)[1]	1 x (1 ... 50)[1], 2 x (1 ... 35)[1]
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 x (0.5 ... 1.5)[1], 2 x (0.75 ... 2.5)[1]	2 x (1 ... 2.5)[1], 2 x (2.5 ... 6)[1], max. 1 x 10	2 x (1 ... 25)[1], 1 x (1 ... 35)[1]
• AWG cables, solid or stranded	AWG	2 x (20 ... 16)[1], 2 x (18 ... 14)[1], 2 x 12	2 x (16 ... 12)[1], 2 x (14 ... 8)[1]	2 x (18 ... 2)[1], 1 x (18 ... 1)[1]
Connection type		**Spring-type terminals**		
Operating devices	mm	3.0 x 0.5 and 3.5 x 0.5		
Conductor cross-sections (min./max.), 1 conductor can be connected				
• Solid or stranded	mm^2	1 x (0.5 ... 4)	1 x (1 ... 10)	--
• Finely stranded without end sleeve	mm^2	1 x (0.5 ... 2.5)	1 x (1 ... 6)	--
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	1 x (0.5 ... 2.5)	1 x (1 ... 6)	--
• AWG cables, solid or stranded	AWG	1 x (20 ... 12)	1 x (18 ... 8)	--
Connection type		**Straight-through transformers**		
Diameter of opening	mm	--		15

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

3RB30, 3RB31 up to 80 A for standard applications

Type		3RB301., 3RB311.	3RB302., 3RB312.	3RB3036, 3RB3133
Size		S00	S0	S2
Auxiliary circuit				
Number of NO contacts		1		
Number of NC contacts		1		
Auxiliary contacts – assignment		1 NO for the signal "tripped"; 1 NC for disconnecting the contactor		
Rated insulation voltage U_i (pollution degree 3)	V	300		
Rated impulse withstand voltage U_{imp}	kV	4		
Auxiliary contacts – contact rating				
• NC contact with alternating current AC-14/AC-15, rated operational current I_e at U_e:				
- 24 V	A	4		
- 120 V	A	4		
- 125 V	A	4		
- 250 V	A	3		
• NO contact with alternating current AC-14/AC-15, rated operational current I_e at U_e:				
- 24 V	A	4		
- 120 V	A	4		
- 125 V	A	4		
- 250 V	A	3		
• NC contact, NO contact with direct current DC-13, rated operational current I_e at U_e:				
- 24 V	A	2		
- 60 V	A	0.55		
- 110 V	A	0.3		
- 125 V	A	0.3		
- 250 V	A	0.11		
• Conventional thermal current I_{th}	A	5		
• Contact reliability (suitability for PLC control; 17 V, 5 mA)		Yes		
Short-circuit protection				
• With fuse, operational class gG	A	6		
Ground-fault protection (only 3RB31)		The information refers to sinusoidal residual currents at 50/60 Hz.		
• Tripping value I_Δ		> 0.75 × I_{motor}		
• Operating range I		Lower current setting value < I_{motor} < 3.5 × upper current setting value		
• Response time t_{trip} (in steady-state condition)	s	< 1		
Integrated electrical remote RESET (only 3RB31)				
Connecting terminals A3, A4		24 V DC, max. 200 mA for approx. 20 ms, then < 10 mA		
Protective separation between auxiliary current paths acc. to IEC 60947-1	V	300		
CSA, UL, UR rated data				
Auxiliary circuit – switching capacity		3RB30: B600, R300; 3RB31: B300, R300		
Conductor cross-sections for auxiliary circuit				
Connection type		**Screw terminals**		
Terminal screw		M3, Pozidriv size 2		
Operating devices	mm	⌀ 5 ... 6		
Prescribed tightening torque	Nm	0.8 ... 1.2		
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected				
• Solid or stranded	mm^2	1 × (0.5 ... 4)[1], 2 × (0.5 ... 2.5)[1]		
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	1 × (0.5 ... 2.5)[1], 2 × (0.5 ... 1.5)[1]		
• AWG cables, solid or stranded	AWG	2 × (20 ... 14)		
Connection type		**Spring-type terminals**		
Operating devices	mm	3.0 x 0.5		
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected				
• Solid or stranded	mm^2	2 × (0.25 ... 1.5)		
• Finely stranded without end sleeve	mm^2	2 × (0.25 ... 1.5)		
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 × (0.25 ... 1.5)		
• AWG cables, solid or stranded	AWG	2 × (24 ... 16)		

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

Selection and ordering data

3RB30 electronic overload relays, CLASS 10E

Features and technical specifications:

- Connection methods
  - Sizes S00 and S0:
    Main and auxiliary circuit: Either screw or spring-type terminals
  - Size S2:
    Main circuit: Screw terminals with box terminal or as straight-through transformer,
    auxiliary circuit: Either screw or spring-type terminals
- Overload protection, phase failure protection and unbalance protection
- Internal power supply
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Switch position indicator
- TEST function and self-monitoring
- Sealable covers (optional accessory)

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

3RB3016-1TB0 3RB3026-1VB0 3RB3036-1.B0 3RB3036-1.W1 3RB3016-1TE0 3RB3026-1VE0 3RB3036-1.D0 3RB3036-1.X1

Size contactor[2]	Trip class	Current setting value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", operational class gG[1]	DT	Screw terminals		DT	Spring-type terminals	
					Article No.	Price per PU		Article No.	Price per PU
	CLASS	A	A						
Size S00									
S00	***Devices for mounting onto contactor[2]***								
	10E	0.1 … 0.4	4	▶	**3RB3016-1RB0**		A	**3RB3016-1RE0**	
	10E	0.32 … 1.25	6	▶	**3RB3016-1NB0**		A	**3RB3016-1NE0**	
	10E	1 … 4	20	▶	**3RB3016-1PB0**		A	**3RB3016-1PE0**	
	10E	3 … 12	25	▶	**3RB3016-1SB0**		A	**3RB3016-1SE0**	
	10E	4 … 16	25	▶	**3RB3016-1TB0**		A	**3RB3016-1TE0**	
Size S0									
S0	***Devices for mounting onto contactor[2]***								
	10E	0.1 … 0.4	4	▶	**3RB3026-1RB0**		A	**3RB3026-1RE0**	
	10E	0.32 … 1.25	6	▶	**3RB3026-1NB0**		A	**3RB3026-1NE0**	
	10E	1 … 4	20	▶	**3RB3026-1PB0**		A	**3RB3026-1PE0**	
	10E	3 … 12	25	▶	**3RB3026-1SB0**		A	**3RB3026-1SE0**	
	10E	6 … 25	50	▶	**3RB3026-1QB0**		A	**3RB3026-1QE0**	
	10E	10 … 40	50	▶	**3RB3026-1VB0**		A	**3RB3026-1VE0**	
Size S2									
S2	***Devices with screw terminals (main current side) and for mounting onto contactor[2]***								
	10E	12 … 50	250	NEW A	**3RB3036-1UB0**		A	**3RB3036-1UD0**	
	10E	20 … 80	250	NEW A	**3RB3036-1WB0**		A	**3RB3036-1WD0**	
	Devices with straight-through transformer for stand-alone installation								
	10E	12 … 50	250	NEW A	**3RB3036-1UW1**		A	**3RB3036-1UX1**	
	10E	20 … 80	250	NEW A	**3RB3036-1WW1**		A	**3RB3036-1WX1**	

With the appropriate terminal supports (see "Accessories", page 7/122), these overload relays can also be installed as stand-alone units.

3RB30, 3RB31 up to 80 A for standard applications

3RB30 electronic overload relays, CLASS 20E

Features and technical specifications:

- Connection methods
  - Sizes S00 and S0:
    Main and auxiliary circuit: Either screw or spring-type terminals
  - Size S2:
    Main circuit: Screw terminals with box terminal or as straight-through transformer,
    auxiliary circuit: Either screw or spring-type terminals
- Overload protection, phase failure protection and unbalance protection
- Internal power supply
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Switch position indicator
- TEST function and self-monitoring
- Sealable covers (optional accessory)

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

3RB3016-1TB0 3RB3026-1VB0 3RB3036-1.B0 3RB3036-1.W1 3RB3016-1TE0 3RB3026-1VE0 3RB3036-1.D0 3RB3036-1.X1

Size contactor[2]	Trip class	Current setting value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", operational class gG[1]	DT	Screw terminals		DT	Spring-type terminals	
					Article No.	Price per PU		Article No.	Price per PU
	CLASS	A	A						
Size S00									
S00	***Devices for mounting onto contactor[2]***								
	20E	0.1 … 0.4	4	▶	**3RB3016-2RB0**		A	**3RB3016-2RE0**	
	20E	0.32 … 1.25	6	▶	**3RB3016-2NB0**		A	**3RB3016-2NE0**	
	20E	1 … 4	20	▶	**3RB3016-2PB0**		A	**3RB3016-2PE0**	
	20E	3 … 12	25	▶	**3RB3016-2SB0**		A	**3RB3016-2SE0**	
	20E	4 ... 16	25	▶	**3RB3016-2TB0**		A	**3RB3016-2TE0**	
Size S0									
S0	***Devices for mounting onto contactor[2]***								
	20E	0.1 … 0.4	4	▶	**3RB3026-2RB0**		A	**3RB3026-2RE0**	
	20E	0.32 … 1.25	6	▶	**3RB3026-2NB0**		A	**3RB3026-2NE0**	
	20E	1 … 4	20	▶	**3RB3026-2PB0**		A	**3RB3026-2PE0**	
	20E	3 … 12	25	▶	**3RB3026-2SB0**		A	**3RB3026-2SE0**	
	20E	6 … 25	50	▶	**3RB3026-2QB0**		A	**3RB3026-2QE0**	
	20E	10 ... 40	50	▶	**3RB3026-2VB0**		A	**3RB3026-2VE0**	
Size S2									
S2	***Devices with screw terminals (main current side) and for mounting onto contactor[2]***								
	20E	12 ... 50	250	NEW A	**3RB3036-2UB0**		A	**3RB3036-2UD0**	
	20E	20 ... 80	250	NEW A	**3RB3036-2WB0**		A	**3RB3036-2WD0**	
	Devices with straight-through transformer for stand-alone installation								
	20E	12 ... 50	250	NEW A	**3RB3036-2UW1**		A	**3RB3036-2UX1**	
	20E	20 ... 80	250	NEW A	**3RB3036-2WW1**		A	**3RB3036-2WX1**	

With the appropriate terminal supports (see "Accessories", page 7/122), these overload relays can also be installed as stand-alone units.

3RB31 electronic overload relays, CLASS 5E, 10E, 20E or 30E (adjustable)

Features and technical specifications:

- Connection methods
  - Sizes S00 and S0:
    Main and auxiliary circuit: Either screw or spring-type terminals
  - Size S2:
    Main circuit: Screw terminals with box terminal or as straight-through transformer,
    auxiliary circuit: Either screw or spring-type terminals
- Overload protection, phase failure protection and unbalance protection
- Internal ground-fault detection (activatable)
- Internal power supply
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Electrical remote RESET integrated
- Switch position indicator
- TEST function and self-monitoring
- Sealable covers (optional accessory)

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

3RB3113-4TB0 3RB3123-4VB0 3RB3133-4.B0 3RB3133-4.W1 3RB3113-4TE0 3RB3123-4VE0 3RB3133-4.D0 3RB3133-4.X1

Size contactor[2]	Trip class	Current setting value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", operational class gG[1]	DT	Screw terminals	DT	Spring-type terminals
					Article No. / Price per PU		Article No. / Price per PU
	CLASS	A	A				
Size S00							
S00	***Devices for mounting onto contactor[2]***						
	5E, 10E, 20E or 30E adjustable	0.1 … 0.4	4	▶	**3RB3113-4RB0**	A	**3RB3113-4RE0**
		0.32 … 1.25	6	▶	**3RB3113-4NB0**	A	**3RB3113-4NE0**
		1 … 4	20	▶	**3RB3113-4PB0**	A	**3RB3113-4PE0**
		3 … 12	25	▶	**3RB3113-4SB0**	A	**3RB3113-4SE0**
		4 … 16	25	▶	**3RB3113-4TB0**	A	**3RB3113-4TE0**
Size S0							
S0	***Devices for mounting onto contactor[2]***						
	5E, 10E, 20E or 30E adjustable	0.1 … 0.4	4	▶	**3RB3123-4RB0**	A	**3RB3123-4RE0**
		0.32 … 1.25	6	▶	**3RB3123-4NB0**	A	**3RB3123-4NE0**
		1 … 4	20	▶	**3RB3123-4PB0**	A	**3RB3123-4PE0**
		3 … 12	25	▶	**3RB3123-4SB0**	A	**3RB3123-4SE0**
		6 … 25	50	▶	**3RB3123-4QB0**	A	**3RB3123-4QE0**
		10 ... 40	50	▶	**3RB3123-4VB0**	A	**3RB3123-4VE0**
Size S2							
S2	***Devices with screw terminals (main current side) and for mounting onto contactor[2]***						
	5E, 10E, 20E or 30E adjustable	12 ... 50	250	NEW A	**3RB3133-4UB0**	A	**3RB3133-4UD0**
		20 ... 80	250	NEW A	**3RB3133-4WB0**	A	**3RB3133-4WD0**
	Devices with straight-through transformer for stand-alone installation						
	5E, 10E, 20E or 30E adjustable	12 ... 50	250	NEW A	**3RB3133-4UW1**	A	**3RB3133-4UX1**
		20 ... 80	250	NEW A	**3RB3133-4WW1**	A	**3RB3133-4WX1**

With the appropriate terminal supports (see "Accessories", page 7/122), these overload relays can also be installed as stand-alone units.

Overview

Overload relays for standard applications

The following optional accessories are available for the 3RB30/3RB31 electronic overload relays:

- Size-specific terminal support for stand-alone installation, in sizes S00 and S0 also with spring-type terminals
- Mechanical RESET (for all sizes)
- Cable release for resetting devices which are difficult to access (for all sizes)
- Sealable cover (for all sizes)

Selection and ordering data

Version	Size	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Terminal supports for stand-alone installation							
 3RU2916-3AA01  3RU2926-3AA01  3RU2936-3AA01  3RU2916-3AC01  3RU2926-3AC01							
Terminal supports for overload relays with screw terminals			**Screw terminals**				
For separate mounting of the overload relays; screw and snap-on mounting onto standard mounting rail	S00	▶	**3RU2916-3AA01**		1	1 unit	41F
	S0	▶	**3RU2926-3AA01**		1	1 unit	41F
	S2	NEW A	**3RU2936-3AA01**		1	1 unit	41F
Terminal supports for overload relays with spring-type terminals			**Spring-type terminals**				
For separate mounting of the overload relays; screw and snap-on mounting onto standard mounting rail	S00	B	**3RU2916-3AC01**		1	1 unit	41F
	S0	B	**3RU2926-3AC01**		1	1 unit	41F
Mechanical RESET							
 3RB3980-0A with pushbutton and extension plunger							
Resetting plungers, holders and formers	S00 ... S2	▶	**3RB3980-0A**		1	1 unit	41F
Pushbuttons with extended stroke (12 mm), IP65, ⌀ 22 mm	S00 ... S2	B	**3SB3000-0EA11**		1	1 unit	41J
Extension plungers For compensation of the distance between a pushbutton and the unlatching button of the relay	S00 ... S2	A	**3SX1335**		1	1 unit	41J

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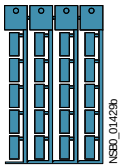
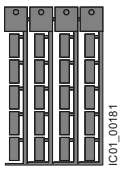
روبروی پالایشگاه نفت پارس، پلاک ۱۲

his quantity or a multiple thereof.
Illustrations are approximate

	Version	Size	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Cable releases with holder for RESET								
 3RB3980-0.	For ⌀ 6.5 mm holes in the control panel; max. control panel thickness 8 mm							
	• Length 400 mm	S00 ... S2	▶	**3RB3980-0B**		1	1 unit	41F
	• Length 600 mm	S00 ... S2	▶	**3RB3980-0C**		1	1 unit	41F
Sealable covers								
 3RB3984-0	For covering the setting knobs	S00 ... S2	▶	**3RB3984-0**		1	1 unit	41F

General accessories

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

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

More information

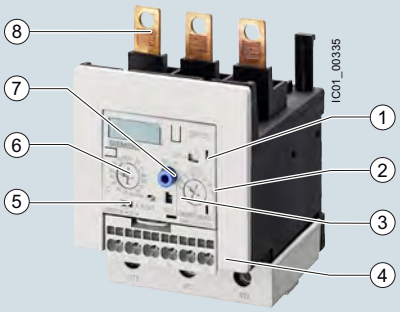
Manuals

Overview

Note:

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

- in the Catalog Add-On IC 10 AO · 2015 at the Information and Download Center
- in the interactive catalog CA 01
- in the Industry Mall



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

SIRIUS 3RB2143-4ED0 electronic overload relay

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 ("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 rated motor current. This current rise is detected by the current transformers integrated into the devices and evaluated by corresponding solid-state circuits which then output a pulse to the auxiliary contacts. The auxiliary contacts then switch off the load by means of a contactor. The break time depends on the ratio between the tripping current and current setting I_e and is stored in the form of a long-term stable tripping characteristic.

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 ("Function",

The 3RB2 electronic overload relays are suitable for operation with frequency converters. Please follow 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.

For 3RB30 and 3RB31 overload relay sizes S00 to S2, see page 7/119 onwards.

Use in hazardous areas

The 3RB20/3RB21 electronic overload relays are suitable for the overload protection of motors with the following types of protection:

- Ⓔx II (2) G [Ex e] [Ex d] [Ex px]
- Ⓔx II (2) D [Ex t] [Ex p]

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**	**4**	**6**	**–**	**1**	**Q**	**B**	**0**

Note:

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

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

Benefits

The most important features and benefits of the 3RB20/3RB21 electronic overload relays are listed in the overview table (see "General Data", page 7/87 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

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

Ambient conditions

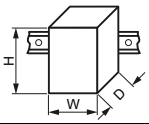
The devices are insensitive to external influences such as shocks, corrosive ambient conditions, ageing and temperature fluctuations.

For the temperature range from –25 C to +60 °C, the 3RB20 and 3RB21 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.

Technical specifications

The following technical information is intended to provide an initial overview of the various types of device and functions.

Type			**3RB2046, 3RB2143**	**3RB2056, 3RB2153**	**3RB2066, 3RB2163**
Size			S3	S6	S10/S12
Dimensions (W x H x D) (overload relay with stand-alone installation support)		mm	70 x 86 x 124	120 x 119 x 155	145 x 147 x 156
General data					
Trips in the event of			Overload, phase failure, and phase unbalance + ground fault (for 3RB21 only)		
Trip class acc. to IEC 60947-4-1		CLASS	3RB20: 10 or 20; 3RB21: 5, 10, 20 and 30 adjustable		
Phase failure sensitivity			Yes		
Overload warning			No		
Reset and recovery					
• Reset options after tripping			3RB20: Manual and automatic RESET; 3RB21: Manual, automatic and remote RESET		
• Recovery time					
- For automatic RESET			Approx. 3 min		
- For manual RESET			Immediately		
- For remote RESET			Immediately		
Features					
• Display of operating state on device			Yes, by means of switch position indicator slide		
• TEST function			Yes, test of electronics by pressing the TEST button/ test of auxiliary contacts and wiring of control circuit by actuating the switch position indicator slide/self-monitoring		
• RESET button			Yes		
• STOP button			No		
Protection and operation of explosion-proof motors					
EC type test certificate number according to directive 94/9/EC (ATEX)			PTB 06 ATEX 3001 Ⓔx II (2) G [Ex e] [Ex d] [Ex px] Ⓔx II (2) G [Ex t] [Ex p]		
Ambient temperatures					
• Storage/transport		°C	-40 ... +80		
• Operation		°C	-25 ... +60		
• Temperature compensation		°C	+60		
• Permissible rated current at					
- Temperature inside control cabinet 60 °C, stand-alone installation		%	100	100	100 or 90[1]
- Temperature inside control cabinet 60 °C, mounted on contactor		%	100	70	70
- Temperature inside control cabinet 70 °C		%	On request		
Degree of protection acc. to IEC 60529			IP20	IP20 (terminal compartment: IP00 degree of protection)	
Touch protection acc. to IEC 61140			Finger-safe for vertical contact from the front	Finger-safe; for busbar connection with cover	Finger-safe with cover
Shock resistance with sine acc. to IEC 60068-2-27		*g*/ms	15/11 (signaling contact 97/98 in position "tripped": 4 *g*/11 ms)		
Electromagnetic compatibility (EMC) – Interference immunity					
• Conductor-related interference					
- Burst acc. to IEC 61000-4-4 (corresponds to degree of severity 3)		kV	2 (power ports), 1 (signal ports)		
- Surge acc. to IEC 61000-4-5 (corresponds to degree of severity 3)		kV	2 (line to earth), 1 (line to line)		
• Electrostatic discharge according to IEC 61000-4-2 (corresponds to degree of severity 3)		kV	8 (air discharge), 6 (contact discharge)		
• Field-related interference acc. to IEC 61000-4-3 (corresponds to degree of severity 3)		V/m	10		
Electromagnetic compatibility (EMC) – emitted interference			Degree of severity B acc. to EN 55011 (CISPR 11) and EN 55022 (CISPR 22)		
Resistance to extreme climates – air humidity		%	100		
Dimensions			"Dimensional drawings", see		
Installation altitude above sea level		m	Up to 2 000		
Mounting position			Any		
Type of mounting			Direct mounting/stand-alone installation with terminal support	Direct mounting/stand-alone installation	

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

Type		**3RB2046, 3RB2143**
Size		S3
Main circuit		
Rated insulation voltage U_i (pollution degree 3)	V	1 000
Rated impulse withstand voltage U_{imp}	kV	8
Rated operational voltage U_e	V	1 000
Type of current		
• Direct current		No
• Alternating current		Yes, 50/60 Hz ± 5 %
Current setting	A	12.5 ... 50, 25 ... 100
Power loss per unit (max.)	W	0.05
Short-circuit protection		
• With fuse without contactor		See "Selection and ordering data" on pages 7/130 to 7/132
• With fuse and contactor		"Short-Circuit Protection with Fuses/Motor Starter Protectors for Motor
Protective separation between main and auxiliary current paths acc. to IEC 60947-1 (pollution degree 2)		
• For systems with grounded neutral point	V	690
• For systems with ungrounded neutral point	V	600
Conductor cross-sections of the main circuit		
Connection type		**Screw terminals with box terminal**
Terminal screw		M8, 4 mm Allen screw
Operating devices	mm	4 mm Allen screw
Prescribed tightening torque	Nm	4 ... 6
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected		
• Solid	mm^2	2 × (2.5 ... 16)
• Finely stranded without end sleeve	mm^2	--
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 × (2.5 ... 35)[1], 1 × (2.5 ... 50)[1]
• Stranded	mm^2	2 × (10 ... 50)[1], 1 × (10 ... 70)[1]
• AWG cables, solid or stranded	AWG	2 × (10 ... 1/0)[1], 1 × (10 ... 2/0)[1]
• Ribbon cables (Number x Width x Thickness)	mm	2 × (6 × 9 × 0.8)
Connection type		**Busbar connections**
Terminal screw		M6 × 20
Prescribed tightening torque	Nm	4 ... 6
Conductor cross-sections (min./max.)		
• Finely stranded with cable lug	mm^2	2 × 70
• Stranded with cable lug	mm^2	3 × 70
• AWG cables, solid or stranded, with cable lug	AWG	2/0
• With connecting bars (max. width)	mm	12
Connection type		**Straight-through transformers**
Diameter of opening	mm	18

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

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

Type		**3RB2056, 3RB2153**	**3RB2066, 3RB2163**
Size		S6	S10/S12
Main circuit			
Rated insulation voltage U_i (pollution degree 3)	V	1 000	
Rated impulse withstand voltage U_{imp}	kV	8	
Rated operational voltage U_e	V	1 000	
Type of current			
• Direct current		No	
• Alternating current		Yes, 50/60 Hz ± 5 %	
Current setting	A	50 ... 200	55 ... 250, 160 ... 630
Power loss per unit (max.)	W	0.05	
Short-circuit protection			
• With fuse without contactor		See "Selection and ordering data" on pages 7/130 to 7/132	
Protective separation between main and auxiliary current paths acc. to IEC 60947-1 (pollution degree 2)			
• For systems with grounded neutral point	V	690	
• For systems with ungrounded neutral point	V	600	
Conductor cross-sections of the main circuit			
Connection type		**Screw terminals with box terminal**	
Terminal screw	mm	4 mm Allen screw	5 mm Allen screw
Operating devices	mm	4 mm Allen screw	5 mm Allen screw
Prescribed tightening torque	Nm	1 ... 12	20 ... 22
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected			
• Solid	mm^2	--	--
• Finely stranded without end sleeve	mm^2	With 3RT1955-4G box terminal: 2 × (1 × max. 50, 1 × max. 70), 1 × (10 ... 70); With 3RT1956-4G box terminal: 2 × (1 × max. 95, 1 × max. 120), 1 × (10 ... 120)	2 × (50 ... 185), Rear clamping point only: 1 × (70 ... 240); rear clamping point only: 1 × (120 ... 185)
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	With 3RT1955-4G box terminal: 2 × (1 × max. 50, 1 × max. 70), 1 × (10 ... 70); With 3RT1956-4G box terminal: 2 × (1 × max. 95, 1 × max. 120), 1 × (10 ... 120)	2 × (50 ... 185), Rear clamping point only: 1 × (70 ... 240); rear clamping point only: 1 × (120 ... 185)
• Stranded	mm^2	With 3RT1955 -4G box terminal: 2 × (max. 70), 1 × (16 ... 70); With 3RT1956-4G box terminal: 2 × (max. 120), 1 × (16 ... 120)	2 × (70 ... 240), Rear clamping point only: 1 × (95 ... 300); rear clamping point only: 1 × (120 ... 240)
• AWG cables, solid or stranded	AWG	With 3RT1955-4G box terminal: 2 × (max. 1/0), 1 × (6 ... 2/0); With 3RT1956-4G box terminal: 2 × (max. 3/0), 1 × (6 ... 250 kcmil)	2 × (2/0 ... 500 kcmil), rear clamping point only: 1 × (3/0 ... 600 kcmil); rear clamping point only: 1 × (250 kcmil ... 500 kcmil)
• Ribbon cables (Number x Width x Thickness)	mm	With 3RT1955-4G box terminal: 2 × (6 × 15.5 × 0.8), 1 × (3 × 9 × 0.8 ... 6 × 15.5 × 0.8); With 3RT1956-4G box terminal: 2 × (10 × 15.5 × 0.8), 1 × (3 × 9 × 0.8 ... 10 × 15.5 × 0.8)	2 × (20 × 24 × 0.5), 1 × (6 × 9 × 0.8 ... 20 × 24 × 0.5)
Connection type		**Busbar connections**	
Terminal screw		M8 × 25	M10 × 30
Prescribed tightening torque	Nm	10 ... 14	14 ... 24
Conductor cross-sections (min./max.)			
• Finely stranded with cable lug	mm^2	16 ... 95[1]	50 ... 240[2]
• Stranded with cable lug	mm^2	25 ... 120[1]	70 ... 240[2]
• AWG cables, solid or stranded, with cable lug	AWG	4 ... 250 kcmil	2/0 ... 500 kcmil
• With connecting bars (max. width)	mm	15	25
Connection type		**Straight-through transformers**	
Diameter of opening	mm	24.5	--

[1] When connecting cable lugs according to DIN 46235 with conductor cross-sections of 95 mm^2 and more, the 3RT1956-4EA1 terminal cover must be used to ensure phase clearance.

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

Type		3RB2046, 3RB2143	3RB2056, 3RB2153	3RB2066, 3RB2163
Size		S3	S6	S10/S12
Auxiliary circuit				
Number of NO contacts		1		
Number of NC contacts		1		
Auxiliary contacts – assignment		1 NO for the signal "tripped"; 1 NC for disconnecting the contactor		
Rated insulation voltage U_i (pollution degree 3)	V	300		
Rated impulse withstand voltage U_{imp}	kV	4		
Auxiliary contacts – contact rating				
• NC contact with alternating current AC-14/AC-15, rated operational current I_e at U_e:				
- 24 V	A	4		
- 120 V	A	4		
- 125 V	A	4		
- 250 V	A	3		
• NO contact with alternating current AC-14/AC-15, rated operational current I_e at U_e:				
- 24 V	A	4		
- 120 V	A	4		
- 125 V	A	4		
- 250 V	A	3		
• NC contact, NO contact with direct current DC-13, rated operational current I_e at U_e:				
- 24 V	A	2		
- 60 V	A	0.55		
- 110 V	A	0.3		
- 125 V	A	0.3		
- 250 V	A	0.11		
• Conventional thermal current I_{th}	A	5		
• Contact reliability (suitability for PLC control; 17 V, 5 mA)		Yes		
Short-circuit protection				
• With fuse, operational class gG	A	6		
Ground-fault protection (only 3RB21)		The information refers to sinusoidal residual currents at 50/60 Hz.		
• Tripping value I_Δ		> 0.75 × I_{motor}		
• Operating range I		Lower current setting value < I_{motor} < 3.5 × upper current setting value		
• Response time t_{trip} (in steady-state condition)	s	< 1		
Integrated electrical remote RESET (only 3RB21)				
Connecting terminals A3, A4		24 V DC, 100 mA, 2.4 W short-term		
Protective separation between auxiliary current paths acc. to IEC 60947-1	V	300		
CSA, UL, UR rated data				
Auxiliary circuit – switching capacity		B300, R300		
Conductor cross-sections of the auxiliary circuit				
Connection type		**Screw terminals**		
Terminal screw		M3, Pozidriv size 2		
Operating devices	mm	⌀ 5 ... 6		
Prescribed tightening torque	Nm	0.8 ... 1.2		
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected				
• Solid and stranded	mm^2	1 × (0.5 ... 4)[1], 2 × (0.5 ... 2.5)[1]		
• Finely stranded without end sleeve	mm^2	--		
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	1 × (0.5 ... 2.5)[1], 2 × (0.5 ... 1.5)[1]		
• AWG cables, solid or stranded	AWG	2 × (20 ... 14)		
Connection type		**Spring-type terminals**		
Operating devices	mm	3.0 x 0.5		
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected				
• Solid and stranded	mm^2	2 × (0.25 ... 1.5)		
• Finely stranded without end sleeve	mm^2	--		
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 × (0.25 ... 1.5)		
• AWG cables, solid or stranded	AWG	2 × (24 ... 16)		

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

Selection and ordering data

3RB20 electronic overload relays for mounting onto contactors and stand-alone installation, CLASS 10

Features and technical specifications:

- Connection methods
  - Size S3
    Main circuit: Busbar connection with box terminal or as straight-through transformer,
    auxiliary circuit: Either screw or spring-type terminals
  - Size S6
    Main circuit: With busbar connection or as straight-through transformer,
    auxiliary circuit: Either screw or spring-type terminals
  - Sizes S10/S12:
    Main circuit: With busbar connection,
    auxiliary circuit: Either screw or spring-type terminals
- Overload protection, phase failure protection and unbalance protection
- Internal power supply
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Switch position indicator
- TEST function and self-monitoring

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


3RB2046-1ED0


3RB2056-1FW2


3RB2066-1MF2

Size contactor	Trip class	Current setting value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", operational class gG[1]	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
	CLASS	A	A						
Size S3									
Devices with screw terminals, for mounting onto contactor									
S3	10	12.5 … 50	160	▶	**3RB2046-1UB0**		A	**3RB2046-1UD0**	
S3	10	25 … 100	315	▶	**3RB2046-1EB0**		A	**3RB2046-1ED0**	
Devices with straight-through transformer, for stand-alone installation									
S3	10	25 … 100	315	▶	**3RB2046-1EW1**		▶	**3RB2046-1EX1**	
Size S6									
Devices with connecting bar, for mounting onto contactor and stand-alone installation									
S6	10	50 … 200	315	▶	**3RB2056-1FC2**		A	**3RB2056-1FF2**	
Devices with straight-through transformer, for mounting onto contactor and stand-alone installation									
For mounting onto S6 contactors with box terminals	10	50 … 200	315	▶	**3RB2056-1FW2**		▶	**3RB2056-1FX2**	
Size S10/S12									
Devices with connecting bar, for mounting onto contactor and stand-alone installation									
S10/S12 and size 14 (3TF68/ 3TF69)[2]	10	55 … 250	400	▶	**3RB2066-1GC2**		▶	**3RB2066-1GF2**	
	10	160 … 630	800	▶	**3RB2066-1MC2**		▶	**3RB2066-1MF2**	

[2] For 3TF68/3TF69 contactors, direct mounting is not possible.

3RB20 electronic overload relays for mounting onto contactors and stand-alone installation, CLASS 20

Features and technical specifications:

- Connection methods
  - Size S3
    Main circuit: Busbar connection with box terminal or as straight-through transformer,
    auxiliary circuit: Either screw or spring-type terminals
  - Size S6
    Main circuit: With busbar connection or as straight-through transformer,
    auxiliary circuit: Either screw or spring-type terminals
  - Sizes S10/S12:
    Main circuit: With busbar connection,
    auxiliary circuit: Either screw or spring-type terminals
- Overload protection, phase failure protection and unbalance protection
- Internal power supply
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Switch position indicator
- TEST function and self-monitoring

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


3RB2046-2ED0


3RB2056-2FW2


3RB2066-2MF2

Size contactor	Trip class	Current setting value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", operational class gG[1]	DT	**Screw terminals** (on auxiliary current side)	DT	**Spring-type terminals** (on auxiliary current side)
					Article No. / Price per PU		Article No. / Price per PU
	CLASS	A	A				
Size S3							
Devices with screw terminals, for mounting onto contactor							
S3	20	12.5 … 50	160	▶	**3RB2046-2UB0**	A	**3RB2046-2UD0**
S3	20	25 … 100	315	▶	**3RB2046-2EB0**	A	**3RB2046-2ED0**
Devices with straight-through transformer, for stand-alone installation							
S3	20	25 … 100	315	▶	**3RB2046-2EW1**	▶	**3RB2046-2EX1**
Size S6							
Devices with connecting bar, for mounting onto contactor and stand-alone installation							
S6	20	50 … 200	315	▶	**3RB2056-2FC2**	A	**3RB2056-2FF2**
Devices with straight-through transformer, for mounting onto contactor and stand-alone installation							
For mounting onto S6 contactors with box terminals	20	50 … 200	315	▶	**3RB2056-2FW2**	▶	**3RB2056-2FX2**
Size S10/S12[2]							
Devices with connecting bar, for mounting onto contactor and stand-alone installation							
S10/S12 and size 14 (3TF68/ 3TF69)[2]	20	55 … 250	400	▶	**3RB2066-2GC2**	▶	**3RB2066-2GF2**
	20	160 … 630	800	▶	**3RB2066-2MC2**	▶	**3RB2066-2MF2**

For 3TF68/3TF69 contactors, direct mounting is not possible.

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

3RB21 electronic overload relays for mounting onto contactors and stand-alone installation, CLASS 5, 10, 20 and 30 adjustable

Features and technical specifications:

- Connection methods
  - Size S3
    Main circuit: Busbar connection with box terminal or as straight-through transformer,
    auxiliary circuit: Either screw or spring-type terminals
  - Size S6
    Main circuit: With busbar connection or as straight-through transformer,
    auxiliary circuit: Either screw or spring-type terminals
  - Sizes S10/S12:
    Main circuit: With busbar connection,
    auxiliary circuit: Either screw or spring-type terminals
- Overload protection, phase failure protection and unbalance protection
- Internal ground-fault detection (activatable)
- Internal power supply
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Electrical remote RESET integrated
- Switch position indicator
- TEST function and self-monitoring

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


3RB2143-4ED0


3RB2153-4FX2


3RB2163-4MC2

Size contactor	Trip class	Current setting value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", operational class gG[1]	DT	**Screw terminals** (on auxiliary current side)	DT	**Spring-type terminals** (on auxiliary current side)
					Article No. / Price per PU		Article No. / Price per PU
	CLASS	A	A				
Size S3							
Devices with screw terminals, for mounting onto contactor							
S3	5, 10, 20 and 30 adjustable	12.5 … 50	160	▶	**3RB2143-4UB0**	▶	**3RB2143-4UD0**
S3		25 … 100	315	▶	**3RB2143-4EB0**	▶	**3RB2143-4ED0**
Devices with straight-through transformer, for stand-alone installation							
S3				▶	**3RB2143-4EW1**	▶	**3RB2143-4EX1**
Size S6							
Devices with connecting bar, for mounting onto contactor and stand-alone installation							
S6	5, 10, 20 and 30 adjustable	50 … 200	315	▶	**3RB2153-4FC2**	▶	**3RB2153-4FF2**
Devices with straight-through transformer, for mounting onto contactor and stand-alone installation							
For mounting onto S6 contactors with box terminals	5, 10, 20 and 30 adjustable			▶	**3RB2153-4FW2**	▶	**3RB2153-4FX2**
Size S10/S12[2]							
Devices with connecting bar, for mounting onto contactor and stand-alone installation							
S10/S12 and size 14 (3TF68/ 3TF69)[2]	5, 10, 20 and 30 adjustable	55 … 250	400	▶	**3RB2163-4GC2**	▶	**3RB2163-4GF2**
		160 … 630	800	▶	**3RB2163-4MC2**	▶	**3RB2163-4MF2**

For 3TF68/3TF69 contactors, direct mounting is not possible.

Overview

Overload relays for standard applications

The following optional accessories are available for the 3RB20 and 3RB21 electronic overload relays:

- Mechanical RESET (for all sizes)
- Cable release for resetting devices which are difficult to access (for all sizes)
- Sealable cover (for all sizes)
- Terminal covers for sizes S3 to S10/S12
- Box terminal blocks for sizes S6 and S10/S12

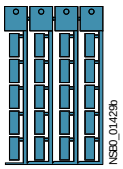
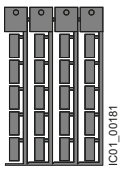
Selection and ordering data

	Version	Size	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Mechanical RESET								
 3RU1900-1A with pushbutton and extension plunger	**Resetting plungers, holders and formers**	S3 ... S10/S12	▶	**3RU1900-1A**		1	1 unit	41F
	Pushbuttons with extended stroke (12 mm), IP65, ⌀ 22 mm	S3 ... S10/S12	B	**3SB3000-0EA11**		1	1 unit	41J
	Extension plungers For compensation of the distance between a pushbutton and the unlatching button of the relay	S3 ... S10/S12	A	**3SX1335**		1	1 unit	41J
Cable releases with holder for RESET								
 3RU1900-1.	For ⌀ 6.5 mm holes in the control panel; max. control panel thickness 8 mm	S3 ... S10/S12						
	• Length 400 mm		▶	**3RU1900-1B**		1	1 unit	41F
	• Length 600 mm		▶	**3RU1900-1C**		1	1 unit	41F
Sealable covers								
 3RB2984-0	For covering the setting knobs	S3 ... S10/S12	▶	**3RB2984-0**		1	10 units	41F
Terminal covers								
 3RT1956-4EA1	**Covers for cable lugs and busbar connections**							
	• Length 55 mm	S3	B	**3RT1946-4EA1**		1	1 unit	41B
	• Length 100 mm	S6	▶	**3RT1956-4EA1**		1	1 unit	41B
	• Length 120 mm	S10/S12	▶	**3RT1966-4EA1**		1	1 unit	41B
	Covers for box terminals							
	• Length 20.8 mm	S3	▶	**3RT1946-4EA2**		1	1 unit	41B
	• Length 25 mm	S6	▶	**3RT1956-4EA2**		1	1 unit	41B
 3RT1956-4EA2	• Length 30 mm	S10/S12	▶	**3RT1966-4EA2**		1	1 unit	41B
	Covers for screw terminals between contactor and overload relay, without box terminals (1 unit required per combination)	S6	▶	**3RT1956-4EA3**		1	1 unit	41B
		S10/S12	▶	**3RT1966-4EA3**		1	1 unit	41B
Box terminal blocks								
 3RT195.-4G	For round and ribbon cables							
	• Up to 70 mm^2	S6[1)]	▶	**3RT1955-4G**		1	1 unit	41B
	• Up to 120 mm^2	S6	▶	**3RT1956-4G**		1	1 unit	41B
	• Up to 240 mm^2	S10/S12	▶	**3RT1966-4G**		1	1 unit	41B

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

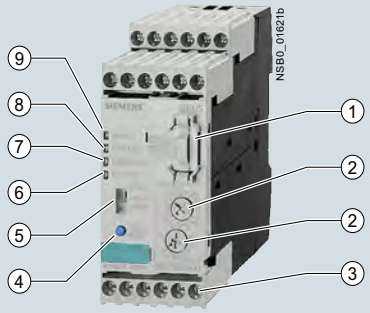
Accessories for 3RB20, 3RB21

General accessories

	Version	Size	Color	For overload relays	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Tools for opening spring-type terminals										
 3RA2908-1A	**Screwdrivers** For all SIRIUS devices with spring-type terminals	Length approx. 200 mm, 3.0 mm x 0.5 mm	Titanium gray/ black, partially insulated	Main and auxiliary circuit connection: 3RB2	A	**Spring-type terminals** **3RA2908-1A**		1	1 unit	41B
Blank labels										
 3RT1900-1SB20	**Unit labeling plates**[1] for SIRIUS devices	20 mm x 7 mm	Pastel turquoise	3RB2	D	**3RT1900-1SB20**		100	340 units	41B
		20 mm x 7 mm	Titanium gray	3RB2	D	**3RT2900-1SB20**		100	340 units	41B
	Adhesive inscription labels [1]	19 mm x 6 mm	Pastel turquoise	3RB2	C	**3RT1900-1SB60**		100	3 060 units	41B
 3RT2900-1SB20	For SIRIUS devices	19 mm x 6 mm	Zinc yellow	3RB2	C	**3RT1900-1SD60**		100	3 060 units	41B

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

Overview



(1) 3RB2985 function expansion module:
Enables more functions to be added, e.g. internal ground-fault detection and/or an analog output with corresponding signals.

(2) Motor current and trip class setting:
Setting the device to the motor current and to the required trip class dependent on the start-up conditions is easy with the two rotary switches.

(3) Connecting terminals (removable joint block):
The generously sized terminals permit connection of two conductors with different cross-sections for the auxiliary, control and sensor circuits. Connection is possible with screw connection and alternatively with spring-type connection.

(4) 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.

(5) Selector switch for manual/automatic RESET:
With this switch you can choose between manual and automatic RESET.

(6) Red LED "OVERLOAD":
A continuous red light signals an active overload trip; a flickering red light signals an imminent trip (overload warning).

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

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

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

SIRIUS 3RB22 and 3RB23 evaluation modules

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

These units have been designed for inverse-time delayed protection of loads with normal and heavy starting ("Function", against excessive temperature rises due to overload, phase unbalance or phase failure. An overload, phase unbalance or phase failure result in an increase of the motor current beyond the set rated motor current.

This current rise is detected by means of a current measuring module (see page 7/152) and electronically evaluated by the evaluation module which is connected to it. The evaluation electronics sends a signal to the auxiliary contacts. The auxiliary contacts then switch off the load by means of a contactor.

The break time depends on the ratio between the tripping current and current setting I_e

The "tripped" status is signaled by means of a continuous red "OVERLOAD" LED.

The LED indicates imminent tripping of the relay due to overload, phase unbalance or phase failure by flickering when the limit current has been violated. In the case of the 3RB22 and 3RB23 overload relays this warning can also be issued through auxiliary contacts.

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

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

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

After tripping due to overload, phase unbalance, phase failure, thermistor or ground-fault tripping, the relay is reset manually or automatically after the recovery time has elapsed ("Function". In conjunction with a function expansion module, the motor current measured by the microprocessor can be output in the form of an analog signal DC 4 mA to 20 mA for operating rotary coil instruments or for feeding into analog inputs of programmable logic controllers.

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

The 3RB2 electronic overload relays are suitable for operation with frequency converters. Please follow 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.

Use in hazardous areas

The 3RB22 electronic overload relays (monostable) with the 3RB29 current measuring module are suitable for the overload protection of explosion-proof motors.

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

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

Article No. scheme

Digit of the Article No.	1st - 3rd	4th	5th	6th	7th		8th	9th	10th	11th
	□□□	□	□	□	□	–	□	□	□	□
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**	**2**	**8**	**3**	**–**	**4**	**A**	**A**	**1**

Note:

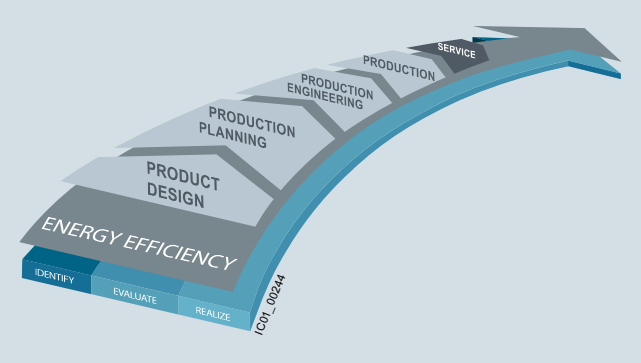
The Article No. scheme is presented here merely for information purposes and for better understanding of the logic behind the article numbers.

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

Benefits

The most important features and benefits of the 3RB22 and 3RB23 electronic overload relays are listed in the overview table (see "General Data", page 7/87 onwards).

Advantages through energy efficiency



Overview of the energy management process

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

The innovative products of the SIRIUS industrial controls portfolio can also make a substantial contribution to a plant's energy efficiency.

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

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

Application

Industries

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

Application

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

If single-phase AC motors are to be protected by the 3RB22 and 3RB23 electronic overload relays, the main current paths of the current measuring modules must be series-connected ("Circuit Diagrams".

Ambient conditions

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

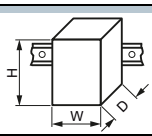
For the temperature range from –25 °C to +60 °C, the 3RB22 and 3RB23 electronic overload relays compensate the temperature in accordance with IEC 60947-4-1.

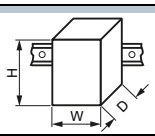
Configuration notes for use of the devices below –25 °C or above +60 °C on request.

Technical specifications

The following technical information is intended to provide an initial overview of the various types of device and functions.

Detailed information, see

Type – Overload relay: evaluation modules			3RB2283-4A.1	3RB2383-4A.1
Size contactor			S00 ... S10/S12	
Dimensions of evaluation modules (W x H x D)		mm	45 x 111 x 95	
General data				
Trips in the event of			Overload, phase failure and phase unbalance (> 40 % according to NEMA), + ground fault (with corresponding function expansion module) and activation of the thermistor motor protection (with closed PTC sensor circuit)	
Trip class acc. to IEC 60947-4-1		CLASS	5, 10, 20 and 30 adjustable	
Phase failure sensitivity			Yes	
Overload warning			Yes, from 1.125 x I_e for symmetrical loads and from 0.85 x I_e for unsymmetrical loads	
Reset and recovery				
• Reset options after tripping			Manual, automatic and remote RESET	
• Recovery time				
- For automatic RESET		min.	- for tripping due to overcurrent: 3 (stored permanently) - for tripping by thermistor: time until the motor temperature has fallen 5 K below the response temperature - for tripping due to a ground fault: no automatic RESET	
- For manual RESET		min.	- for tripping due to overcurrent: 3 (stored permanently) - for tripping by thermistor: time until the motor temperature has fallen 5 K below the response temperature - for tripping due to a ground fault: Immediately	
- For remote RESET		min.	- for tripping due to overcurrent: 3 (stored permanently) - for tripping by thermistor: time until the motor temperature has fallen 5 K below the response temperature - for tripping due to a ground fault: Immediately	
Features				
• Display of operating state on device			Yes, with four LEDs: - green LED "Ready" - red LED "Ground Fault" - red LED "Thermistor" - red LED "Overload"	
• TEST function			Yes, test of LEDs, electronics, auxiliary contacts and wiring of control circuit by pressing the button TEST/RESET / self-monitoring	
• RESET button			Yes, with the TEST/RESET button	
• STOP button			No	
Protection and operation of explosion-proof motors				
EC type test certificate number according to directive 94/9/EC (ATEX)			PTB 05 ATEX 3022 Ex II (2) GD,	--
Ambient temperatures				
• Storage/transport		°C	-40 ... +80	
• Operation		°C	-25 ... +60	
• Temperature compensation		°C	+60	
• Permissible rated current				
- Temperature inside control cabinet 60 °C		%	100	
- Temperature inside control cabinet 70 °C		%	On request	
Degree of protection acc. to IEC 60529			IP20: Current measuring modules in sizes S6 and S10/S12 with busbar connection in conjunction with cover.	
Touch protection acc. to IEC 61140			Finger-safe: Current measuring modules in sizes S6 and S10/S12 with busbar connection in conjunction with cover.	
Shock resistance with sine acc. to IEC 60068-2-27		*g*/ms	15/11	
Electromagnetic compatibility (EMC) – Interference immunity				
• Conductor-related interference				
- Burst acc. to IEC 61000-4-4 (corresponds to degree of severity 3)		kV	2 (power ports), 1 (signal port)	
- Surge acc. to IEC 61000-4-5 (corresponds to degree of severity 3)		kV	2 (line to earth), 1 (line to line)	
• Electrostatic discharge according to IEC 61000-4-2 (corresponds to degree of severity 3)		kV	8 (air discharge), 6 (contact discharge)	
• Field-related interference according to IEC 61000-4-3 (corresponds to degree of severity 3)		V/m	10	
Electromagnetic compatibility (EMC) – emitted interference			Degree of severity A according to EN 55011 (CISPR 11) and EN 55022 (CISPR 22)	

Type – Overload relay: evaluation modules		**3RB2283-4A.1**	**3RB2383-4A.1**
Size contactor		S00 ... S10/S12	
Dimensions of evaluation modules (W x H x D)	mm	45 x 111 x 95	

General data (continued)		
Resistance to extreme climates – air humidity	%	100
Dimensions		"Dimensional drawings", see • Reference Manual "Protection Equipment – 3RU1, 3RB2 Overload Relays",
Installation altitude above sea level	m	Up to 2 000
Mounting position		Any
Type of mounting		
• Evaluation modules		Stand-alone installation
• Current measuring module	Size	S00 to S3: Stand-alone installation, S6 and S10/S12: stand-alone installation or mounting onto contactors

Type – Overload relay: evaluation modules		**3RB2283-4A.1, 3RB2383-4A.1**
Size contactor		S00 ... S10/S12
Auxiliary circuit		
Number of NO contacts		2
Number of NC contacts		2
Number of CO contacts		--
Auxiliary contacts – assignment		• Alternative 1 - 1 NO for the signal "tripped by overload and/or thermistor" - 1 NC for disconnecting the contactor - 1 NO for the signal "tripped by ground fault" - 1 NC for disconnecting the contactor or[1)] • Alternative 2 - 1 NO for the signal "tripped by overload and/or thermistor and/or ground fault" - 1 NC for disconnecting the contactor - 1 NO for overload warning - 1 NC for disconnecting the contactor
Rated insulation voltage U_i (pollution degree 3)	V	300
Rated impulse withstand voltage U_{imp}	kV	4
Auxiliary contacts – contact rating		
• NC contact with alternating current AC-14/AC-15, rated operational current I_e at U_e		
- 24 V	A	6
- 120 V	A	6
- 125 V	A	6
- 250 V	A	3
• NO contact with alternating current AC-14/AC-15, rated operational current I_e at U_e		
- 24 V	A	6
- 120 V	A	6
- 125 V	A	6
- 250 V	A	3
• NC contact, NO contact with direct current DC-13, rated operational current I_e at U_e		
- 24 V	A	2
- 60 V	A	0.55
- 110 V	A	0.3
- 125 V	A	0.3
- 250 V	A	0.2
• Conventional thermal current I_{th}	A	5
• Contact reliability (suitability for PLC control; 17 V, 5 mA)		Yes
Short-circuit protection		
• With fuse, operational class gG	A	6
• With miniature circuit breaker, C characteristic	A	1.6
Protective separation between auxiliary current paths acc. to IEC 60947-1	V	300
CSA, UL, UR rated data		
Auxiliary circuit – switching capacity		B300, R300

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

Type – Overload relay: evaluation modules		3RB2283-4A.1, 3RB2383-4A.1
Size contactor		S00 ... S10/S12
Control circuit		
Rated insulation voltage U_i (pollution degree 3)	V	300
Rated impulse withstand voltage U_{imp}	kV	4
Rated control supply voltage U_s		
• 50/60 Hz AC	V	24 ... 240
• DC	V	24 ... 240
Operating range		
• 50/60 Hz AC		$0.85 \times U_{s\,min} \leq U_s \leq 1.1 \times U_{s\,max}$
• DC		$0.85 \times U_{s\,min} \leq U_s \leq 1.1 \times U_{s\,max}$
Rated power		
• 50/60 Hz AC	W	0.5
• DC	W	0.5
Mains buffering time	ms	200
Sensor circuit		
Thermistor motor protection (PTC thermistor sensor)		
• Summation cold resistance	kΩ	≤ 1.5
• Response value	kΩ	3.4 ... 3.8
• Return value	kΩ	1.5 ... 1.65
Ground-fault detection		The information refers to sinusoidal residual currents at 50/60 Hz.
• Tripping value I_Δ [1)] - For $0.3 \times I_e < I_{motor} < 2.0 \times I_e$ - For $2.0 \times I_e < I_{motor} < 8.0 \times I_e$		 $> 0.3 \times I_e$ $> 0.15 \times I_{motor}$
• Response time t_{trip}	ms	500 ... 1 000
Analog output [1)2)]		
Rated values		
• Output signal	mA	4 ... 20
• Measuring range		0 ... $1.25 \times I_e$ 4 mA corresponds to $0 \times I_e$ 16.8 mA corresponds to $1.0 \times I_e$ 20 mA corresponds to $1.25 \times I_e$
• Load, max.	Ω	100
Conductor cross-sections for the auxiliary, control and sensor circuit as well as the analog output		
Connection type		**Screw terminals**
Terminal screw		M3, Pozidriv size 2
Operating devices	mm	3.0 x 0.5
Prescribed tightening torque	Nm	0.8 ... 1.2
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected		
• Solid or stranded	mm^2	1 × (0.5 ... 4)[3)], 2 × (0.5 ... 2.5)[3)]
• Finely stranded without end sleeve	mm^2	--
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	1 × (0.5 ... 2.5)[3)], 2 × (0.5 ... 1.5)[3)]
• AWG cables, solid or stranded	AWG	2 × (20 ... 14)
Connection type		**Spring-type terminals**
Operating devices	mm	3.0 x 0.5
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected		
• Solid or stranded	mm^2	2 × (0.25 ... 1.5)
• Finely stranded without end sleeve	mm^2	--
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 × (0.25 ... 1.5)
• AWG cables, solid or stranded	AWG	2 × (24 ... 16)

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

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

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

Selection and ordering data

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

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

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

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

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

✓ Available

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

3RB2283-4AA1,
3RB2383-4AA1

3RB2283-4AC1,
3RB2383-4AC1

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

Note:

Overview of overload relays – matching contactors, see page 7/93.

Current measuring modules and related connecting cables, see page 7/152, general accessories, see page 7/154 onwards.

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

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

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

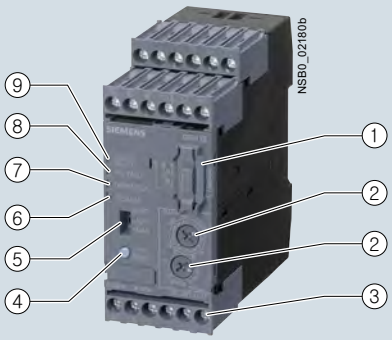
Note:

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

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

2) The following information on ground-fault protection refers to sinusoidal residual currents at 50/60 Hz:
- With a motor current of between 0.3 and 2 times the current setting I_e, the unit will trip at a ground-fault current equal to 30 % of the current setting.
- With a motor current of between 2 and 8 times the current setting I_e the unit will trip at a ground-fault current equal to 15 % of the current setting.
- The response delay amounts to between 0.5 s and 1 s.

Overview



(1) Plug-in point for operator panel:
enables connection of the 3RA6935-0A operator panel.

(2) Motor current and trip class setting:
Setting the device to the motor current and to the required trip class dependent on the start-up conditions is easy with the two rotary switches.

(3) 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.

(4) 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.

(5) Selector switch for manual/automatic RESET:
With this switch you can choose between manual and automatic RESET.

(6) Red LED "OVERLOAD":
A continuous red light signals an active overload trip; a flickering led light signals an imminent trip (overload warning).

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

(8) Red LED "GND FAULT":
A continuous red light signals an active ground-fault trip.

(9) Green LED "DEVICE/IO-Link:
A continuous green light signals that the device is working correctly, a green flickering light signals the communication through IO-Link.

SIRIUS 3RB24 evaluation module

The modular 3RB24 electronic overload relay, which is powered via IO-Link (with monostable auxiliary contacts) up to 630 A (up to 820 A possible with a series transformer) have been designed for inverse-time delayed protection of loads with normal and heavy starting ("Function", against excessive temperature rises due to overload, phase unbalance or phase failure. It comprises an evaluation unit,
a current measuring module and a connecting cable.

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

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

This current rise is detected by means of the current measuring module (see page 7/152) and electronically evaluated by the evaluation module which is connected to it. The evaluation electronics sends a signal to the auxiliary contacts. The auxiliary contacts then switch off the load by means of a contactor.

The break time depends on the ratio between the tripping current and current setting I_e and is stored in the form of a long-term stable tripping characteristic.The "tripped" status is signaled by means of a continuously illuminated red "OVERLOAD" LED and also reported as a group fault via IO-Link.

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

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

To protect the loads against incomplete ground faults due to damage to the insulation, humidity, condensed water, etc., the 3RB24 electronic overload relays offer the possibility of internal ground-fault detection (for details, not possible in conjunction with contactor assemblies for wye-delta starting). In the event of a ground fault, the 3RB24 relays trip instantaneously.

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

The reset after overload, phase unbalance, phase failure, thermistor or ground-fault tripping is performed manually by key on site, via IO-Link or by electrical remote RESET or automatically after the cooling time (motor model) or for thermistor protection after sufficient cooling. Power cuts in devices due to function monitors (broken wire or short-circuit on the thermistor) can only be reset on-site ("Function",

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

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

The 3RB24 electronic overload relay for IO-Link is suitable for operation with frequency converters. Please follow the instructions in the manual "SIRIUS 3RB24 Solid-State Overload Relay for IO-Link".

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.

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

Use in hazardous areas

The 3RB24 electronic overload relays for IO-Link with the 3RB29 current measuring module are suitable for the overload protection of motors with the following types of protection:

- II (2) G [Ex e] [Ex d] [Ex px]
- II (2) D [Ex t] [Ex p]

EC type test certificate for Group II, Category (2) G/D exists. It has the number PTB 11 ATEX 3014.

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**	**4**	**8**	**3**	**–**	**4**	**A**	**A**	**1**

Note:

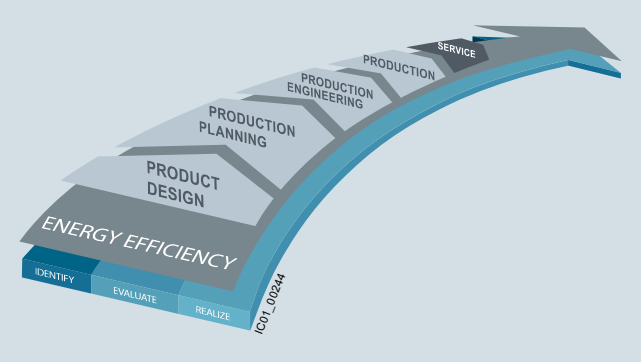
The Article No. scheme is presented here merely for information purposes and for better understanding of the logic behind the article numbers.

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

Benefits

The most important features and benefits of the 3RB24 electronic overload relays for IO-Link are listed in the overview table (see "General Data", page 7/87 onwards).

Advantages through energy efficiency



Overview of the energy management process

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

The innovative products of the SIRIUS industrial controls portfolio can also make a substantial contribution to a plant's energy efficiency.

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

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

Application

Industries

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

Application

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

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

If single-phase AC motors are to be protected by the 3RB24 electronic overload relays, the main current paths of the current measuring modules must be series-connected ("Circuit Diagrams".

Ambient conditions

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

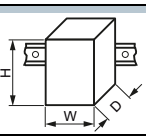
For the temperature range from -25 C to +60 °C, the 3RB24 electronic overload relays compensate the temperature in accordance with IEC 60947-4-1.

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

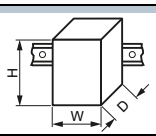
Technical specifications

The following technical information is intended to provide an initial overview of the various types of device and functions.

Detailed information, see

Type – Overload relay: evaluation modules			**3RB2483-4A.1**
Size contactor			S00 ... S10/S12
Dimensions of evaluation modules (W x H x D)		mm	45 x 111 x 95
General data			
Trips in the event of			Overload, phase failure and phase unbalance (> 40 % according to NEMA), + ground fault (connectable and disconnectable) and activation of the thermistor motor protection (with closed PTC sensor circuit)
Trip class acc. to IEC 60947-4-1		CLASS	5, 10, 20 and 30 adjustable
Phase failure sensitivity			Yes
Overload warning			Yes, from 1.125 x I_e for symmetrical loads and from 0.85 x I_e for unsymmetrical loads
Reset and recovery			
• Reset options after tripping			Manual and automatic RESET, electrical remote RESET or through IO-Link
• Recovery time			
- For automatic RESET		min.	- for tripping due to overcurrent: 3 (stored permanently) - for tripping by thermistor: time until the motor temperature has fallen 5 K below the response temperature - for tripping due to a ground fault: no automatic RESET
- For manual RESET		min.	- for tripping due to overcurrent: 3 (stored permanently) - for tripping by thermistor: time until the motor temperature has fallen 5 K below the response temperature - for tripping due to a ground fault: Immediately
- For remote RESET		min.	- for tripping due to overcurrent: 3 (stored permanently) - for tripping by thermistor: time until the motor temperature has fallen 5 K below the response temperature - for tripping due to a ground fault: Immediately
Features			
• Display of operating state on device			Yes, with 4 LEDs: - Green "DEVICE/IO-Link" LED - Red LED "Ground Fault" - Red LED "Thermistor" - Red "Overload" LED
• TEST function			Yes, test of LEDs, electronics, auxiliary contacts and wiring of control circuit by pressing the button TEST/RESET / self-monitoring
• RESET button			Yes, with the TEST/RESET button
• STOP button			No
Protection and operation of explosion-proof motors			
EC type test certificate number according to directive 94/9/EC (ATEX)			PTB 11 ATEX 3014 Ex II (2) G [Ex e] [Ex d] [Ex px] Ex II (2) G [Ex t] [Ex p],
Ambient temperatures			
• Storage/transport		°C	-40 ... +80
• Operation		°C	-25 ... +60
• Temperature compensation		°C	+60
• Permissible rated current			
- Temperature inside control cabinet 60 °C		%	100
- Temperature inside control cabinet 70 °C		%	On request
Degree of protection acc. to IEC 60529			IP20: Current measuring modules in sizes S6 and S10/S12 with busbar connection in conjunction with the cover
Touch protection acc. to IEC 61140			Finger-safe: Current measuring modules in sizes S6 and S10/S12 with busbar connection in conjunction with the cover
Shock resistance with sine acc. to IEC 60068-2-27		g/ms	15/11

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

Type – Overload relay: evaluation modules			**3RB2483-4A.1**
Size contactor			S00 ... S10/S12
Dimensions of evaluation modules (W x H x D)		mm	45 x 111 x 95

General data (continued)

Electromagnetic compatibility (EMC) – Interference immunity		
• Conductor-related interference		
- Burst acc. to IEC 61000-4-4 (corresponds to degree of severity 3)	kV	2 (power ports), 1 (signal ports)
- Surge acc. to IEC 61000-4-5 (corresponds to degree of severity 3)	kV	2 (line to earth), 1 (line to line)
• Electrostatic discharge according to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	8 (air discharge), 6 (contact discharge)
• Field-related interference according to IEC 61000-4-3 (corresponds to degree of severity 3)	V/m	10
Electromagnetic compatibility (EMC) – emitted interference		Degree of severity A according to EN 55011 (CISPR 11) and EN 55022 (CISPR 22)
Resistance to extreme climates – air humidity	%	100
Dimensions		"Dimensional drawings", see • Manual "SIRIUS 3RB24 Solid-State Overload Relay for IO-Link",
Installation altitude above sea level	m	Up to 2 000
Mounting position		Any
Type of mounting		
• Evaluation modules		Stand-alone installation
• Current measuring module	Size	S00 to S3: Stand-alone installation, S6 and S10/S12: stand-alone installation or mounting onto contactors

7

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روبروی پالایشگاه نفت پارس، پلاک ۱۲

Type – Overload relay: evaluation modules		**3RB2483-4A.1**
Size contactor		S00 ... S10/S12
Auxiliary circuit		
Number of auxiliary switches		1 CO contact, 1 NO contact connected in series internally
Auxiliary contacts – assignment		• 1 CO contact for selecting the contactor (for reversing starter function), actuated by the control system • 1 NO contact for normal switching duty, actuated by the control system (opens automatically when tripping occurs)
Rated insulation voltage U_i (pollution degree 3)	V	300
Rated impulse withstand voltage U_{imp}	kV	4
Auxiliary contacts – contact rating		
• NC contact with alternating current AC-14/AC-15, rated operational current I_e at U_e		
- 24 V	A	6
- 120 V	A	6
- 125 V	A	6
- 250 V	A	3
• NO contact with alternating current AC-14/AC-15, rated operational current I_e at U_e		
- 24 V	A	6
- 120 V	A	6
- 125 V	A	6
- 250 V	A	3
• NC contact, NO contact with direct current DC-13, rated operational current I_e at U_e		
- 24 V	A	2
- 60 V	A	0.55
- 110 V	A	0.3
- 125 V	A	0.3
- 250 V	A	0.2
• Conventional thermal current I_{th}	A	5
• Contact reliability (suitability for PLC control; 17 V, 5 mA)		Yes
Short-circuit protection		
• With fuse, operational class gG	A	6
• With miniature circuit breaker, C characteristic	A	1.6
Protective separation between auxiliary current paths acc. to IEC 60947-1	V	300
CSA, UL, UR rated data		
Auxiliary circuit – switching capacity		B300, R300
Conductor cross-sections of the auxiliary circuit		
Connection type		**Screw terminals**
Terminal screw		M3, Pozidriv size 2
Operating devices	mm	3.0 x 0.5
Prescribed tightening torque	Nm	0.8 ... 1.2
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected		
• Solid or stranded	mm^2	1 × (0.5 ... 4)[1], 2 × (0.5 ... 2.5)[1]
• Finely stranded without end sleeve	mm^2	--
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	1 × (0.5 ... 2.5)[1], 2 × (0.5 ... 1.5)[1]
• AWG cables, solid or stranded	AWG	2 × (20 ... 14)
Connection type		**Spring-type terminals**
Operating devices	mm	3.0 x 0.5
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected		
• Solid or stranded	mm^2	2 × (0.25 ... 1.5)
• Finely stranded without end sleeve	mm^2	–
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 × (0.25 ... 1.5)
• AWG cables, solid or stranded	AWG	2 × (24 ... 16)

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

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

Type – Overload relay: evaluation modules		**3RB2483-4A.1**
Size contactor		S00 ... S10/S12
Control circuit		
Rated insulation voltage U_i (pollution degree 3)	V	300
Rated impulse withstand voltage U_{imp}	kV	4
Rated control supply voltage U_s [1]		
• DC	V	24 through IO-Link
Operating range		
• DC		$0.85 \times U_{s\,min} \leq U_s \leq 1.1 \times U_{s\,max}$
Rated power		
• DC	W	0.5
Mains buffering time	ms	200
Sensor circuit		
Thermistor motor protection (PTC thermistor sensor)		
• Summation cold resistance	kΩ	≤ 1.5
• Response value	kΩ	3.4 ... 3.8
• Return value	kΩ	1.5 ... 1.65
Ground-fault detection		The information refers to sinusoidal residual currents at 50/60 Hz.
• Tripping value I_Δ - For $0.3 \times I_e < I_{motor} < 2.0 \times I_e$ - For $2.0 \times I_e < I_{motor} < 8.0 \times I_e$		 $> 0.3 \times I_e$ $> 0.15 \times I_{motor}$
• Response time t_{trip}	ms	500 ... 1 000
Analog output[1]		
Rated values		
• Output signal	mA	4 ... 20
• Measuring range		0 ... $1.25 \times I_e$ 4 mA corresponds to $0 \times I_e$ 16.8 mA corresponds to $1.0 \times I_e$ 20 mA corresponds to $1.25 \times I_e$
• Load, max.	Ω	100
Conductor cross-sections for the control and sensor circuit as well as the analog output		
Connection type		**Screw terminals**
Terminal screw		M3, Pozidriv size 2
Operating devices	mm	3.0 x 0.5
Prescribed tightening torque	Nm	0.8 ... 1.2
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected		
• Solid	mm^2	1 × (0.5 ... 4)[2], 2 × (0.5 ... 2.5)[2]
• Finely stranded without end sleeve	mm^2	--
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	1 × (0.5 ... 2.5)[2], 2 × (0.5 ... 1.5)[2]
• Stranded	mm^2	--
• AWG cables, solid or stranded	AWG	2 × (20 ... 14)
Connection type		**Spring-type terminals**
Operating devices	mm	3.0 x 0.5
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected		
• Solid	mm^2	2 × (0.25 ... 1.5)
• Finely stranded without end sleeve	mm^2	--
• Finely stranded with end sleeve (DIN 46228-1)	mm^2	2 × (0.25 ... 1.5)
• Stranded	mm^2	2 × (0.25 ... 1.5)
• AWG cables, solid or stranded	AWG	2 × (24 ... 16)

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

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

Selection and ordering data

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

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

✓ Available

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

3RB2483-4AA1

3RB2483-4AC1

Size contactor	Version	DT	Screw terminals		DT	Spring-type terminals	
			Article No.	Price per PU		Article No.	Price per PU
Evaluation modules							
S00 ... S12	Monostable	►	**3RB2483-4AA1**		A	**3RB2483-4AC1**	

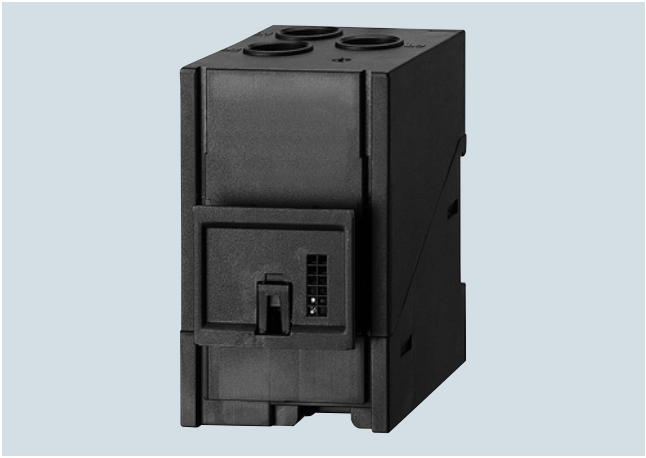
Notes:

- Overview of overload relays – matching contactors, see page 7/93.
- Analog input modules, e.g. SM 331, must be configured for 4-wire measuring transducers. The analog input module may not supply current to the analog output of the 3RB24 relay.

Current measuring modules and related connecting cables, see page 7/152 onwards, "Accessories", see page 7/153 onwards.

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

Overview



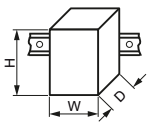
SIRIUS 3RB2906 current measuring module

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

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

Technical specifications

The following technical information is intended to provide an initial overview of the various types of device and functions.

Type – Overload relays: Current measuring modules			**3RB2906**		**3RB2956**	**3RB2966**
Size contactor			S00/S0	S2/S3	S6	S10/S12
Dimensions of current measuring modules (W x H x D)		mm	45 x 84 x 45	55 x 94 x 72	120 x 119 x 145	145 x 147 x 148
Main circuit						
Rated insulation voltage U_i (pollution degree 3)		V	1 000			
Rated impulse withstand voltage U_{imp}		kV	6		8	
Rated operational voltage U_e		V	1 000			
Type of current						
• Direct current			No			
• Alternating current			Yes, 50/60 Hz ± 5 %			
Current setting		A	0.3 ... 3; 2.4 ... 25	10 ... 100	20 ... 200	63 ... 630
Power loss per unit (max.)		W	0.5			
Short-circuit protection						
• With fuse without contactor			See "Selection and ordering data" on page 7/152			
• With fuse and contactor			See configuration manuals			
Protective separation between main and auxiliary current paths acc. to IEC 60947-1 (pollution degree 2)						
• For systems with grounded neutral point		V	690			
• For systems with ungrounded neutral point		V	600			

Type – Overload relays: Current measuring modules			3RB2906		3RB2956	3RB2966
Size contactor			S00/S0	S2/S3	S6	S10/S12
Dimensions of current measuring modules (W x H x D)		mm	45 x 84 x 45	55 x 94 x 72	120 x 119 x 145	145 x 147 x 148
Conductor cross-sections of main circuit						
Connection type			Screw terminals with box terminal			
Terminal screw		mm	--		4 mm Allen screw	5 mm Allen screw
Operating devices		mm	--		4 mm Allen screw	5 mm Allen screw
Prescribed tightening torque		Nm	--		10 ... 12	20 ... 22
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected						
• Solid or stranded		mm^2	--		With 3RT1955-4G box terminal: 2 × (max. 70), 1 × (16 ... 70) With 3RT1956-4G box terminal: 2 × (max. 120), 1 × (16 ... 120)	2 × (70 ... 240), Rear clamping point only: 1 × (95 ... 300) Rear clamping point only: 1 × (120 ... 240)
• Finely stranded without end sleeve		mm^2	--		With 3RT1955-4G box terminal: 2 × (1 × max. 50, 1 × max. 70), 1 × (10 ... 70) With 3RT1956-4G box terminal: 2 × (1 × max. 95, 1 × max. 120), 1 × (10 ... 120)	2 × (50 ... 185), Rear clamping point only: 1 × (70 ... 240) Rear clamping point only: 1 × (120 ... 185)
• Finely stranded with end sleeve (DIN 46228-1)		mm^2	--		With 3RT1955-4G box terminal: 2 × (1 × max. 50, 1 × max. 70), 1 × (10 ... 70) With 3RT1956-4G box terminal: 2 × (1 × max. 95, 1 × max. 120), 1 × (10 ... 120)	2 × (50 ... 185), Rear clamping point only: 1 × (70 ... 240) Rear clamping point only: 1 × (120 ... 185)
• AWG cables		AWG	--		With 3RT1955-4G box terminal: 2 × (max. 1/0), 1 × (6 ... 2/0) With 3RT1956-4G box terminal: 2 × (max. 3/0), 1 × (6 ... 250 kcmil)	2 × (2/0 ... 500 kcmil), rear clamping point only: 1 × (3/0 ... 600 kcmil) Rear clamping point only: 1 × (250 kcmil ... 500 kcmil)
• Ribbon cables (Number x Width x Thickness)		mm	--		With 3RT1955-4G box terminal: 2 × (6 × 15.5 × 0.8), 1 × (3 × 9 × 0.8 ... 6 × 15.5 × 0.8) With 3RT1956-4G box terminal: 2 × (10 × 15.5 × 0.8), 1 × (3 × 9 × 0.8 ... 10 × 15.5 × 0.8)	2 × (20 × 24 × 0.5), 1 × (6 × 9 × 0.8 ... 20 × 24 × 0.5)
Connection type			Busbar connections			
Terminal screw			--		M8 × 25	M10 x 30
Prescribed tightening torque		Nm	--		10 ... 14	14 ... 24
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected						
• Solid with cable lug		mm^2	--		16 ... 95[1]	50 ... 240[2]
• Stranded with cable lug		mm^2	--		25 ... 120[1]	70 ... 240[2]
• AWG cables, solid or stranded, with cable lug		AWG	--		4 ... 250 kcmil	2/0 ... 500 kcmil
• With connecting bars (max. width)		mm	--		17	25
Connection type			Straight-through transformers			
Diameter of opening		mm	7.5	14	25	--

[1] When connecting cable lugs according to DIN 46235 with conductor cross-sections of 95 mm^2 and more, the 3RT1956-4EA1 terminal cover must be used to ensure phase clearance.

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

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

Selection and ordering data

Current measuring modules (essential accessory)

3RB2906-2BG1, 3RB2906-2DG1

3RB2906-2JG1

3RB2956-2TG2

3RB2966-2WH2

Size contactor	Current setting value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", operational class gG[1]	For overload relays	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
	A	A							
Sizes S00/S0									
Devices with straight-through transformer, for stand-alone installation									
S00/S0	0.3 … 3	20	3RB22 to 3RB24	▶	**3RB2906-2BG1**		1	1 unit	41G
	2.4 … 25	63		▶	**3RB2906-2DG1**		1	1 unit	41G
Sizes S2/S3									
Devices with straight-through transformer, for stand-alone installation									
S2/S3	10 … 100	315	3RB22 to 3RB24	▶	**3RB2906-2JG1**		1	1 unit	41G
Size S6									
Devices with busbar connection, for mounting onto contactor and stand-alone installation									
S6	20 … 200	315	3RB22 to 3RB24	▶	**3RB2956-2TH2**		1	1 unit	41G
Devices with straight-through transformer, for mounting onto contactor and stand-alone installation									
For mounting onto S6 contactors with box terminals	20 … 200	315	3RB22 to 3RB24	▶	**3RB2956-2TG2**		1	1 unit	41G
Sizes S10/S12[2]									
Devices with busbar connection, for mounting onto contactor and stand-alone installation									
S10/S12 and size 14 (3TF68/3TF69)[2]	63 … 630	800	3RB22 to 3RB24	▶	**3RB2966-2WH2**		1	1 unit	41G

Note:

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

[1] Maximum protection by fuse only for overload relay, type of coordination "2". For fuse values in connection with contactors, see Configuration Manuals

[2] For 3TF68/3TF69 contactors, direct mounting is not possible.

Accessories

	Size contactor	Version	For overload relays	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Connecting cables (necessary accessories)									
 3RB2987-2.		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)	3RB24, 3RB29	▶	**3RB2987-2B**		1	1 unit	41F
	S00 ... S12	• Length 0.5 m	3RB24, 3RB29	▶	**3RB2987-2D**		1	1 unit	41F

Additional general accessories, see page 7/154.

Overview

Overload relays for High-Feature applications

The following optional accessories are available for the 3RB22 to 3RB24 electronic overload relays:

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

Selection and ordering data

Accessories for 3RB24 overload relays

Version	For overload relays	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Operator panels for evaluation modules							
 3RA6935-0A **Operator panels (set)** One set comprises: • 1 x operator panel • 1 x 3RA6936-0A enabling module • 1 x 3RA6936-0B interface cover • 1 x fixing terminal Note: The connecting cable between the evaluation module and the operator panel is not included in the scope of supply; please order separately.	3RB24	A	**3RA6935-0A**		1	1 unit	42F
Connecting cable Length 2.5 m (round), for connecting the evaluation module to the operator panel	3RB24	▶	**3UF7933-0BA00-0**		1	1 unit	42J
Enabling modules (replacement)	3RB24	A	**3RA6936-0A**		1	1 unit	42F
Interface covers	3RB24	A	**3RA6936-0B**		1	5 units	42F

Additional general accessories, see next page.

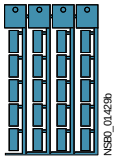
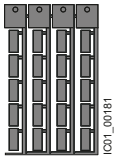
More information

Accessories for 3RB22, 3RB23, 3RB24

General accessories

	Version	Size	For overload relays	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Sealable covers for evaluation modules									
 3RB2984-2	For covering the setting knobs	--	3RB22 to 3RB24	▶	**3RB2984-2**		1	10 units	41F
Terminal covers for current measuring modules									
	Covers for cable lugs and busbar connections								
 3RT1956-4EA1	• Length 100 mm	S6	3RB2956	▶	**3RT1956-4EA1**		1	1 unit	41B
	• Length 120 mm	S10/S12	3RB2966	▶	**3RT1966-4EA1**		1	1 unit	41B
	Covers for box terminals								
	• Length 25 mm	S6	3RB2956	▶	**3RT1956-4EA2**		1	1 unit	41B
	• Length 30 mm	S10/S12	3RB2966	▶	**3RT1966-4EA2**		1	1 unit	41B
 3RT1956-4EA2	**Covers for screw terminals** between contactor and overload relay, without box terminals (1 unit required per combination)	S6	3RB2956	▶	**3RT1956-4EA3**		1	1 unit	41B
		S10/S12	3RB2966	▶	**3RT1966-4EA3**		1	1 unit	41B
Box terminal blocks for current measuring modules									
	For round and ribbon cables								
 3RT195.-4G	• Up to 70 mm^2	S6[1)]	3RB2956	▶	**3RT1955-4G**		1	1 unit	41B
	• Up to 120 mm^2	S6	3RB2956	▶	**3RT1956-4G**		1	1 unit	41B
	• Up to 240 mm^2	S10/S12	3RB2966	▶	**3RT1966-4G**		1	1 unit	41B
Push-in lugs for evaluation modules and current measuring modules									
 3RP1903	For screw fixing the evaluation modules	--	3RB22 to 3RB24	B	**3RP1903**		1	10 units	41H
 3RB1900-0B	For screw fixing the current measuring modules (2 units per module)	S00 ... S3	3RB2906	A	**3RB1900-0B**		100	10 units	41F

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

	Version	Size	Color	For overload relays	DT	Article No.	Price per PU	PU (UNIT, SET, M)	PS*	PG
Tools for opening spring-type terminals										
						Spring-type terminals				
 3RA2908-1A	**Screwdrivers** For all SIRIUS devices with spring-type terminals	Length approx. 200 mm, 3.0 mm x 0.5 mm	Titanium gray/ black, partially insulated	Main and auxiliary circuit connection: 3RB2	A	**3RA2908-1A**		1	1 unit	41B
Blank labels										
 3RT1900-1SB20	**Unit labeling plates**[1)] for SIRIUS devices	20 mm x 7 mm	Pastel turquoise	3RB2	D	**3RT1900-1SB20**		100	340 units	41B
 3RT2900-1SB20		20 mm x 7 mm	Titanium gray	3RB2	D	**3RT2900-1SB20**		100	340 units	41B

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

Notes:
The 3RA1 load feeders (sizes S00/S0 to S3) can be found
- in the Catalog Add-On IC 10 AO · 2014 at the Information and Download Center
- in the interactive catalog CA 01
- in the Industry Mall

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NEW
Click on the Article No. in the catalog PDF to access it in the Industry Mall and get all related information.

Article-No.
3RA1943-2C
3RA1943-2B
3RA1953-2B
3RA1953-2N