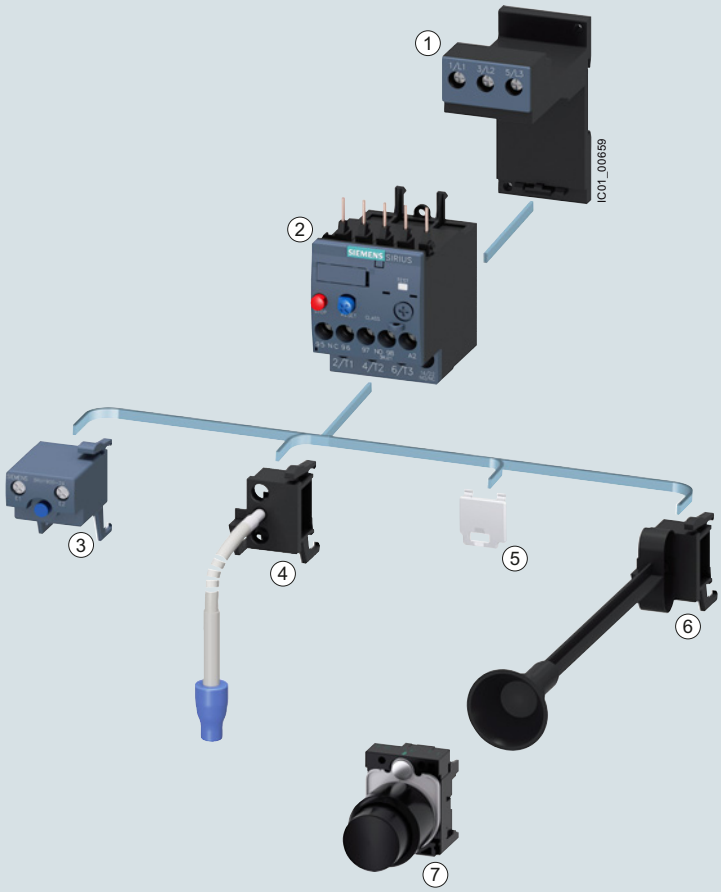
3RU2 for standard applications

Overview

More information	
Homepage, see www.siemens.com/sirius-overloadrelays	Application Manual "SIRIUS Controls with IE3/IE4 motors", see https://support.industry.siemens.com/cs/ww/en/view/94770820
Industry Mall, see www.siemens.com/product?3RU2	Manual, see https://support.industry.siemens.com/cs/ww/en/view/60298164
TIA Selection Tool Cloud (TST Cloud), see https://mall.industry.siemens.com/spice/TSTWeb?kmat=ElectronicOverloadRelay	Characteristics and certificates, see https://support.industry.siemens.com/cs/ww/en/ps/16271
Conversion tool, e.g. from 3RU11 to 3RU21, see www.siemens.com/sirius/conversion-tool	

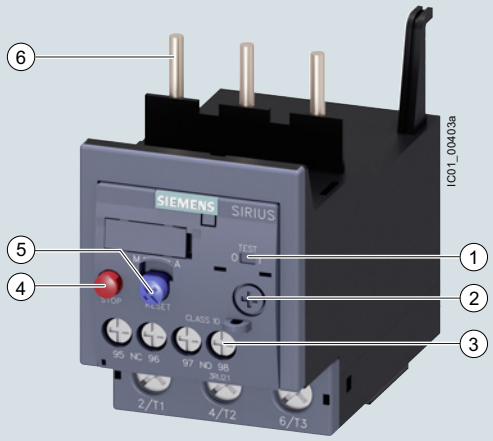


1. Stand-alone assembly support for 3RU2 and 3RB3
2. 3RU21 thermal overload relay Sizes S00 to S3

Mountable accessories

3. Module for remote RESET
4. Cable release with holder for RESET
5. Sealable cover
6. Mechanical RESET
7. Pushbutton

Mountable accessories for 3RU thermal overload relay



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 are screw terminals or spring-type terminals for the main and auxiliary circuits.

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.

SIRIUS 3RU2136-4.B0 thermal overload relay

3RU21 thermal overload relays up to 100 A have been designed to provide current-dependent protection for loads with normal starting against impermissibly high 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 the current setting I_e and is stored in the form of a long-term stable tripping characteristic curve, see Characteristics.

The "tripped" status is signaled by means of a switch position indicator. The relay is reset manually or automatically after a recovery time has elapsed.

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.

Use in hazardous areas

The 3RU2 overload relays are certified in accordance with both the European
explosion protection directive (ATEX) and the international explosion protection standard (IECEx), see Certificates.

Article No. scheme

Product versions		Article number								
Thermal overload relays		**3RU2**	□	□	□	–	□	□	□	□
Device type	e.g. 1 = CLASS 10, 1 NO + 1 NC		□							
Size, rated operational current and power	e.g. 16 = 16 A (7.5 kW) for size S00			□	□					
Setting range for overload release	e.g. 0A = 0.11 ... 0.16 A						□	□		
Connection methods	e.g. B = screw terminals								□	
Installation type	e.g. 0 = mounting on contactor									□
Example		**3RU2**	**1**	**1**	**6**	**–**	**0**	**A**	**B**	**0**

Note:

The Article No. scheme shows an overview of product versions for better understanding of the logic behind the article numbers.

For your orders please use the article numbers quoted in the selection and ordering data.

3RU2 for standard applications

Benefits

The most important features and benefits of the 3RU21 thermal overload relays are listed in the overview table (see "General data", page 7/79 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

3RU21 thermal overload relays compensate temperature in the temperature range from -40 °C to +60 °C according to IEC 60947-4-1. At temperatures from +60 °C to +70 °C, the upper set value of the setting range has to be reduced by a specific factor in accordance with the table below.

Use of SIRIUS protection devices in conjunction with IE3/IE4 motors

Note:

For the use of 3RU21 thermal overload relays in conjunction with highly energy-efficient IE3/IE4 motors, please observe the information on dimensioning and configuring, see Application Manual.

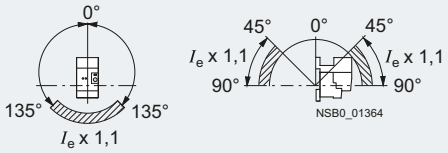
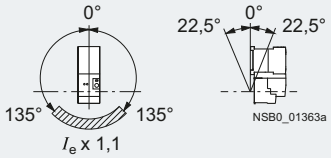
For more information, see page 1/7.

Technical specifications

More information	
System Manual "SIRIUS – System Overview", see https://support.industry.siemens.com/cs/ww/en/view/60311318	Manual, see https://support.industry.siemens.com/cs/ww/en/view/60298164
Configuration Manual "Load Feeders – SIRIUS Modular System", see https://support.industry.siemens.com/cs/ww/en/view/39714188	Technical specifications, see https://support.industry.siemens.com/cs/ww/en/ps/16270/td

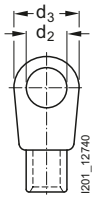
The following technical information is intended to provide an initial overview of the various types of device and functions.

Type		**3RU2116**	**3RU2126**	**3RU2136**	**3RU2146**
Size		S00	S0	S2	S3
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	70 x 106 x 124
• Spring-type terminals	mm	45 x 102 x 79	45 x 114 x 95	55 x 105 x 117	70 x 106 x 124
General data					
Tripping 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 conjunction with the appropriate 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 of motors in hazardous environments					
• according to European Directive 2014/34/EU (ATEX)		DMT 98 ATEX G 001 Ex II (2) GD			
• according to international standard IECEx		IECEx BVS 15.0046 see https://support.industry.siemens.com/cs/ww/en/ps/16270/cert			

Type		**3RU2116**	**3RU2126**	**3RU2136**	**3RU2146**
Size		S00	S0	S2	S3
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	70 x 106 x 124
• Spring-type terminals	mm	45 x 102 x 79	45 x 114 x 95	55 x 105 x 117	70 x 106 x 124
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 (current reduction is required above +60 °C)			
- 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		- IP20 (front side) - Terminal IP00 (use additional terminal covers for higher degree of protection)	
Touch protection acc. to IEC 60529		Finger-safe		Finger-safe, for vertical contact from the front	
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			
Installation altitude above sea level	m	Up to 2 000			
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		For mounting onto contactor or stand-alone installation with terminal support, screw and snap-on mounting onto standard mounting rail.			

3RU2 for standard applications

Type		3RU2116	3RU2126	3RU2136	3RU2146
Size		S00	S0	S2	S3
Main circuit					
Rated insulation voltage U_i (pollution degree 3)	V	690			1000
Rated impulse withstand voltage U_{imp}	kV	6			8
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	0.11 ... 0.16	1.8 ... 2.5	11 ... 16	28 ... 40
		to	to	to	to
	A	11 ... 16	34 ... 40	70 ... 80	80 ... 100
Power loss per unit (max.)	W	4.1 ... 6.3	6.2 ... 7.5	8 ... 14	12 ... 16.5
Short-circuit protection					
• With fuse without contactor		See "Selection and ordering data", pages 7/92 ... 7/95			
• With fuse and contactor		"Short-Circuit Protection with Fuses/Motor Starter Protectors for Motor Feeders", see Configuration Manual.			
Protective separation between main and auxiliary current paths acc. to IEC 60947-1					
• Screw terminals or ring terminal lug connections	V	440	690: Setting range ≤ 25 A	690	
• Spring-type terminals	V	440	440: Setting range > 25 A	690	
Conductor cross-sections of main circuit					
Connection type		**Screw terminals**			**Screw terminals with box terminal**
Terminal screw		M3, Pozidriv size 2	M4, Pozidriv size 2	M6, Pozidriv size 2	4 mm Allen screw
Operating devices	mm	⌀ 5 ... 6	⌀ 5 ... 6	⌀ 5 ... 6	4 mm Allen screw
Prescribed tightening torque	Nm	0.8 ... 1.2	2 ... 2.5	3 ... 4.5	4.5 ... 6
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]	2 x (2.5 ... 16)[1], 2 x (10 ... 50)[1], 1 x (10 ... 70)[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]	2 x (2.5 ... 35)[1], 1 x (2.5 ... 50)[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]	2 x (10 ... 1/0)[1], 1 x (10 ... 2/0)[1]
Removable box terminals[2]					
• With copper bars[3]	mm	--	--	--	2 x 12 x 4
• With cable lugs[4]					
- Terminal screw		--	--	--	M6
- Prescribed tightening torque	Nm	--	--	--	4.5 ... 6
- Usable ring terminal lugs	mm	--	--	--	d_2 = min. 6.3 d_3 = max. 19
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)	--	



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

[2] Cable lug and busbar connection possible after removing the box terminals.

[3] If bars larger than 12 mm x 10 mm are connected, a 3RT2946-4EA2 cover is needed to maintain the required phase clearance, see page 7/97.

[4] When conductors larger than 25 mm^2 are connected, the 3RT2946-4EA2 cover is needed to maintain the required phase clearance, see page 7/97.

Type		**3RU2116**	**3RU2126**	**3RU2136**	**3RU2146**
Size		S00	S0	S2	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, NO contacts 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, NO contacts 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)			

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

3RU21 thermal overload relays for stand-alone installation, sizes S2 and S3, CLASS 10 or 10A

Features and technical specifications:

- Connection methods
  - Main circuit: Screw terminals with box terminal
  - Auxiliary 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

3RU2136-..B1

3RU2136-..D1

3RU2146-..B1

3RU2146-..D1

Size contactor	Trip class	Rated power for three-phase motors, rated value[1]	Current setting value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", operational class gG[2]	SD	Screw terminals		SD	Spring-type terminals	
						Article No.	Price per PU		Article No.	Price per PU
	CLASS	kW	A	A	d			d		
Size S2										
S2	10	15	22 ... 32	80	5	**3RU2136-4EB1**		5	**3RU2136-4ED1**	
	10	18.5	28 ... 40	80	5	**3RU2136-4FB1**		5	**3RU2136-4FD1**	
	10	22	36 ... 45	100	2	**3RU2136-4GB1**		5	**3RU2136-4GD1**	
	10	22	40 ... 50	100	2	**3RU2136-4HB1**		5	**3RU2136-4HD1**	
	10	30	47 ... 57	100	2	**3RU2136-4QB1**		5	**3RU2136-4QD1**	
	10	30	54 ... 65	125	2	**3RU2136-4JB1**		5	**3RU2136-4JD1**	
	10A	37	62 ... 73	160	2	**3RU2136-4KB1**		5	**3RU2136-4KD1**	
	10A	37	70 ... 80	160	2	**3RU2136-4RB1**		5	**3RU2136-4RD1**	
Size S3										
S3	10	30	45 ... 63	125	2	**3RU2146-4JB1**		5	**3RU2146-4JD1**	
	10	37	57 ... 75	160	2	**3RU2146-4KB1**		5	**3RU2146-4KD1**	
	10	45	70 ... 90	160	2	**3RU2146-4LB1**		5	**3RU2146-4LD1**	
	10	45	80 ... 100[3]	200	2	**3RU2146-4MB1**		5	**3RU2146-4MD1**	

[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] Maximum protection by fuse only for overload relays, type of coordination "2". For fuse values in connection with contactors, see Configuration Manual.

[3] For overload relays > 100 A, see 3RB2 electronic overload relays, page 7/110 onwards.

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