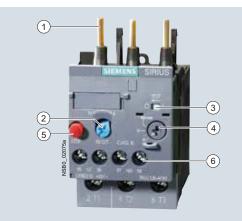
SIRIUS 3RU2 Thermal Overload Relays

3RU2 up to 40 A for standard applications

Overview



- Connection for mounting onto contactors:
 Optimally adapted in electrical, mechanical and design terms to the contactors. The overload relay can be connected directly to these contactor using these pins. Stand-alone installation is possible as an alternative (in conjunction with a terminal bracket for stand-alone installation).
- (2) 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.
- (3) Switch position indicator and TEST function of the wiring: Indicates a trip and enables the wiring test.
- (4) Motor current setting: Setting the device to the rated motor current is easy with the large rotary knob.
- (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.
- Supply terminals:
 Depending on the device version, the terminals for screw, spring-type or ring terminal lug connection are configured for the main and auxiliary circuit.

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

The 3RU21 thermal overload relays up to 40 A have been designed for inverse-time delayed protection of loads with normal starting 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 $I_{\rm e}$ and is stored in the form of a long-term stable tripping characteristic.

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.

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

They comply with all important worldwide standards and approvals.

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

The 3RU21 thermal overload relays are suitable for the overload protection of explosion-proof motors with "increased safety" type of protection EEx e. The relays meet the requirements of EN 60079-7 (Electrical apparatus for areas subject to explosion hazards – Increased safety "e");

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

SIRIUS 3RU21 26-4FB00 thermal overload relay

Order No. scheme

Digit of the Order No.	1st - 3rd	4th	5th	6th	7th		8th	9th	10th	11th	
					-						
Thermal overload relays	3 R U										
Innovations		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	Α	В	0	

Note.

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

For your orders, please use the order numbers quote in the catalog in the Selection and ordering data.

SIRIUS 3RU2 Thermal Overload Relays

3RU2 up to 40 A for standard applications

Benefits

The most important features and benefits of the 3RU21 thermal overload relays are listed in the overview table

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).

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 in accordance with IEC 60947-4-1 for the temperature range of –40 to +60 °C. For temperatures from +60 to +80 °C the upper set value of the setting range must be reduced by the factor listed in the table below.

Ambient temperature	Derating factor for the upper set value Current ranges					
°C	0.11 20 A 17 40 A					
+60	1.0	1.0				
+65	0.94	0.97				
+70	0.87	0.94				
+75	0.81	0.90				
+80	0.73	0.86				

Technical specifications

Туре		3RU21 16	3RU21 26	
Size		S00	S0	
Dimensions (W x H x D)				
(overload relay with stand-alone installation support)				
• Screw terminals	mm	45 x 89 x 79	45 x 97 x 95	
Spring-type terminals	mm	45 x 102 x 80	45 x 114 x 97	
General data				
Trips in the event of		Overload, 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 RES		
		(Remote RESET in combination with	the corresponding accessories)	
Recovery time				
- For automatic RESET - For manual RESET	min min	Depends on the strength of the tripping current and characteristic Depends on the strength of the tripping current and characteristic		
- For remote RESET	min	Depends on the strength of the trip		
Features				
Display of operating state on device		Yes, by means of TEST function/swit	ch position indicator slide	
TEST function		Yes		
RESET button		Yes		
STOP button		Yes		
Safe operation of motors with "increased safety" type of protection				
EC type test certificate number acc. to directive 94/9/EC (ATEX)		On request		
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			1	
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 and spring-type terminals			
Shock resistance with sine acc. to IEC 60068-2-27	g/ms	15/11 (auxiliary contacts 95/96 and	97/98; 8g/11ms)	

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Overload Relays

SIRIUS 3RU2 Thermal Overload Relays

3RU2 up to 40 A for standard applications

Туре		3RU21 16	3RU21 26
Size		500	S0
Dimensions (W x H x D) (overload relay with stand-alone installation support) • Screw terminals	mm	45 x 89 x 79	45 x 97 x 95
Spring-type terminals	mm	45 x 102 x 80	45 x 114 x 97
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	EMC interference immunity is not re	elevant for thermal overload relays
- Surge acc. to IEC 61000-4-5 (corresponds to degree of severity 3)	kV	EMC interference immunity is not re	•
Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	EMC interference immunity is not re	·
Field-related interference acc. to IEC 61000-4-3 (corresponds to degree of severity 3)	V/m	EMC interference immunity is not re	
Electromagnetic compatibility (EMC) – Emitted interference		EMC interference immunity is not re	elevant for thermal overload relays
Resistance to extreme climates – air humidity	%	90	
Dimensions		See "Dimensional drawings"	
Installation altitude above sea level	m	Up to 2 000; above this, please enq	
Mounting position		The diagrams show the permissible onto contactors and stand-alone in hatched area, a setting correction of Stand-alone installation: $ \begin{array}{cccccccccccccccccccccccccccccccccc$	stallation. For installation in the ff 10 % must be implemented. 2,5°
Type of mounting		135° I _e x 1,1	NSB0_01364 ne installation with terminal bracket on TH 35 standard mounting rail.

SIRIUS 3RU2 Thermal Overload Relays

3RU2 up to 40 A for standard applications

Type		3RU21 16	3RU21 26
Size		500	S0
Main circuit			
Rated insulation voltage U _i (pollution degree 3)	V	690	
Rated impulse withstand voltage U _{imp}	kV	6	
Rated operational voltage $U_{\rm e}$	V	690	
Type of current			
Direct current		Yes	
Alternating current		Yes, frequency range up to 400 Hz	
Current setting	AA	0.11 0.16	1.8 2.5
		to 11 16	to 34 40
Power loss per unit (max.)	W	3.9 6.6	3.9 6
Short-circuit protection	VV	5.5 0.0	3.5 0
With fuse without contactor		See "Selection and ordering data"	
With fuse and contactor		See "Technical specifications" —> "	Short circuit protection with fuses!
with fuse and confactor		Motor Protection Circuit Breakers fo	
Protective separation between main and auxiliary conducting path acc. to IEC 60947-1	V	≥ 440	
Conductor cross-sections of main circuit			
Connection type		Screw terminals	
Terminal screw		M3, Pozidriv size 2	M4, Pozidriv size 2
Operating devices	mm	Ø 5 6	Ø 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	mm²	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⁾
• Finely stranded with end sleeves (DIN 46228 T1)	mm²	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
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⁾
Connection type		Spring-type terminals	
Operating devices	mm	3.0 x 0.5 and 3.5 x 0.5	
Conductor cross-sections (min./max.)			
• Solid	mm²	1 x (0.5 4)	1 x (1 10)
Finely stranded without end sleeve	mm²	1 x (0.5 2.5)	1 x (1 6)
• Finely stranded with end sleeves (DIN 46228 T1)	mm²	1 x (0.5 2.5)	1 x (1 6)
AWG cables, solid or stranded	AWG	1 x (20 12)	1 x (18 8)

SIRIUS 3RU2 Thermal Overload Relays

3RU2 up to 40 A for standard applications

Type		3RU21 16	3RU21 26
Size		S00	SO
Auxiliary circuit	1		
Number of NC contacts	1		
Number of NC contacts Auxiliary contacts – assignment		1 NO for the signal "tripped";	
Advinary contacts assignment		1 NC for disconnecting the contact	or
Rated insulation voltage U_i (pollution degree 3)	V	690	
Rated impulse withstand voltage $U_{\rm imp}$	kV	6	
Contact rating of the auxiliary contacts			
• NC contact with alternating current AC-14/AC-15, rated operational current $I_{\rm e}$ at $U_{\rm e}$:			
- 24 V - 120 V	A A	4	
- 125 V	A	4	
- 230 V	Α	3	
- 400 V	A	2	
- 600 V - 690 V	A A	0.75 0.75	
 NO contact with alternating current AC-14/AC-15, rated operational current I_e at U_e: 	7.		
- 24 V	A	3	
- 120 V - 125 V	A A	3	
- 230 V	A	2	
- 400 V	Α	1	
- 600 V	Α	0.75	
- 690 V	Α	0.75	
 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	Α	0.22	
- 125 V	Α	0.22	
- 220 V	A	0.11	
• Conventional thermal current I _{th}	Α	6	
Contact reliability (suitability for PLC control; 17 V, 5 mA)		Yes	
Short-circuit protection			
With fuse Operational class gG	Α	6	
- Quick	A	10	
With miniature circuit breaker (C characteristic)	Α	61)	
Protective separation between auxiliary conducting 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	Ø 5 6	
Prescribed tightening torque	Nm	0.8 1.2	
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected			
• Solid	mm²	2 x (0.5 1.5) ¹⁾ , 2 x (0.75 2.5) ¹⁾	
• Finely stranded with end sleeves (DIN 46228 T1)	mm²	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.)			
• Solid	mm²	2 x (0.5 2.5)	
Finely stranded without end sleeve	mm²	2 x (0.5 1.5)	
• Finely stranded with end sleeves (DIN 46228 T1)	mm²	2 x (0.5 1.5)	
AWG cables, solid or stranded	AWG	2 x (20 14)	

¹⁾ Up to $I_k \le 0.5$ kA; $U \le 260$ V.

SIRIUS 3RU2 Thermal Overload Relays

3RU2 up to 40 A for standard applications

Selection and ordering data

3RU21 thermal overload relays for mounting onto contactor¹⁾, CLASS 10

Features and technical specifications:

- Screw and 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)









3RU21 16-4AB0

3RU21 16-4AC

3RU21 26-4FB0

3RU21 26-4AC

Size contactor ²⁾	Rating for induction motor, rated value ³⁾	Current setting of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", operational class qG ⁴⁾	Screw terminals Order No.	Spring-type terminals Order No.
	114/	^			
s: soo	kW	A	A		
Size S00					
S00	0.04	0.11 0.16	0.5	3RU21 16-0AB0	3RU21 16-0AC0
	0.06	0.14 0.2	1	3RU21 16-0BB0	3RU21 16-0BC0
	0.06 0.09	0.18 0.25 0.22 0.32	1 1.6	3RU21 16-0CB0 3RU21 16-0DB0	3RU21 16-0CC0 3RU21 16-0DC0
	0.09	0.28 0.4	2	3RU21 16-0EB0	3RU21 16-0EC0
	0.12 0.18	0.35 0.5 0.45 0.63	2 2	3RU21 16-0FB0 3RU21 16-0GB0	3RU21 16-0FC0 3RU21 16-0GC0
	0.18	0.45 0.8	4	3RU21 16-0HB0	3RU21 16-0GC0
	0.25	0.7 1	4	3RU21 16-0JB0	3RU21 16-0JC0
	0.37 0.55	0.9 1.25 1.1 1.6	4	3RU21 16-0KB0 3RU21 16-1AB0	3RU21 16-0KC0
	0.75	1.4 2	6 6	3RU21 16-1ABU 3RU21 16-1BB0	3RU21 16-1AC0 3RU21 16-1BC0
	0.75	1.8 2.5	10	3RU21 16-1CB0	3RU21 16-1CC0
	1.1 1.5	2.2 3.2	10 16	3RU21 16-1DB0	3RU21 16-1DC0
	1.5	2.8 4 3.5 5	20	3RU21 16-1EB0 3RU21 16-1FB0	3RU21 16-1EC0 3RU21 16-1FC0
	2.2	4.5 6.3	20 25	3RU21 16-1GB0	3RU21 16-1GC0
	3 4	5.5 8 7 10	25 35	3RU21 16-1HB0	3RU21 16-1HC0
	5.5	9 12.5	35	3RU21 16-1JB0 3RU21 16-1KB0	3RU21 16-1JC0 3RU21 16-1KC0
	7.5	11 16	40	3RU21 16-4AB0	3RU21 16-4AC0
6: 60	7.5	1110	40	3RUZ1 18-4ABU	3RUZ1 18-4ACU
Size S0					
S0	0.75	1.8 2.5	10	3RU21 26-1CB0	3RU21 26-1CC0
	1.1	2.2 3.2	10	3RU21 26-1DB0	3RU21 26-1DC0
	1.5	2.8 4	16	3RU21 26-1EB0	3RU21 26-1EC0
	1.5	3.5 5	20	3RU21 26-1FB0	3RU21 26-1FC0
	2.2	4.5 6.3	20	3RU21 26-1GB0	3RU21 26-1GC0
	3	5.5 8	25	3RU21 26-1HB0	3RU21 26-1HC0
	4	7 10	35	3RU21 26-1JB0	3RU21 26-1JC0
	5.5	9 12.5	35	3RU21 26-1KB0	3RU21 26-1KC0
	7.5	11 16	40	3RU21 26-4AB0	3RU21 26-4AC0
	7.5	14 20	50	3RU21 26-4BB0	3RU21 26-4BC0
	11	17 22	63	3RU21 26-4CB0	3RU21 26-4CC0
	11	20 25	63	3RU21 26-4DB0	3RU21 26-4DC0
	15	23 28	63	3RU21 26-4NB0	3RU21 26-4NC0
	15	27 32	80	3RU21 26-4EB0	3RU21 26-4EC0
	18.5	30 36	80	3RU21 26-4PB0	3RU21 26-4PC0
	18.5	34 40	80	3RU21 26-4FB0	3RU21 26-4FC0

- 1) For matching terminal brackets see "Accessories".
- 2) Observe maximum rated operational current of the devices.
- 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.
- 4) Maximum protection by fuse for overload relay, type of coordination "2".

SIRIUS 3RU2 Thermal Overload Relays

3RU2 up to 40 A for standard applications

3RU21 thermal overload relays for stand-alone installation¹⁾, CLASS 10

Features and technical specifications:

- 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)









3RU21 16-4AB1

3RU21 16-4AC1

3RU21 26-4FB1

3RU21 26-4FC1

Size contactor ²⁾	Rating for induction motor, rated value ³⁾	Current setting of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", operational class gG ⁴⁾	Screw terminals	(1)	Spring-type terminals	8
				Order No.		Order No.	
	kW	A	Α				
Size S00						•	
S00	0.04	0.11 0.16	0.5	3RU21 16-0AB1		3RU21 16-0AC1	
	0.06	0.14 0.2	1	3RU21 16-0BB1		3RU21 16-0BC1	
	0.06	0.18 0.25	1	3RU21 16-0CB1		3RU21 16-0CC1	
	0.09	0.22 0.32	1.6	3RU21 16-0DB1		3RU21 16-0DC1	
	0.09	0.28 0.4	2	3RU21 16-0EB1		3RU21 16-0EC1	
	0.12	0.35 0.5	2	3RU21 16-0FB1		3RU21 16-0FC1	
	0.18	0.45 0.63	2	3RU21 16-0GB1		3RU21 16-0GC1	
	0.18	0.55 0.8	4	3RU21 16-0HB1		3RU21 16-0HC1	
	0.25	0.7 1	4	3RU21 16-0JB1		3RU21 16-0JC1	
	0.37	0.9 1.25	4	3RU21 16-0KB1		3RU21 16-0KC1	
	0.55	1.1 1.6	6	3RU21 16-1AB1		3RU21 16-1AC1	
	0.75	1.4 2	6	3RU21 16-1BB1		3RU21 16-1BC1	
	0.75	1.8 2.5	10	3RU21 16-1CB1		3RU21 16-1CC1	
	1.1	2.2 3.2	10	3RU21 16-1DB1		3RU21 16-1DC1	
	1.5	2.8 4	16	3RU21 16-1EB1		3RU21 16-1EC1	
	1.5	3.5 5	20	3RU21 16-1FB1		3RU21 16-1FC1	
	2.2	4.5 6.3	20	3RU21 16-1GB1		3RU21 16-1GC1	
	3	5.5 8	25	3RU21 16-1HB1		3RU21 16-1HC1	
	4	7 10	35	3RU21 16-1JB1		3RU21 16-1JC1	
	5.5	9 12.5	35	3RU21 16-1KB1		3RU21 16-1KC1	
	7.5	11 16	40	3RU21 16-4AB1		3RU21 16-4AC1	
Size S0							
S0	7.5	14 20	50	3RU21 26-4BB1		3RU21 26-4BC1	
	11	17 22	63	3RU21 26-4CB1		3RU21 26-4CC1	
	11	20 25	63	3RU21 26-4DB1		3RU21 26-4DC1	
	15	23 28	63	3RU21 26-4NB1		3RU21 26-4NC1	
	15	27 32	80	3RU21 26-4EB1		3RU21 26-4EC1	
	18.5	30 36	80	3RU21 26-4PB1		3RU21 26-4PC1	
	18.5	34 40	80	3RU21 26-4FB1		3RU21 26-4FC1	

- 1) Screw and snap-on mounting onto TH 35 standard mounting rail.
- 2) Observe maximum rated operational current of the devices.
- 3) 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.
- 4) Maximum protection by fuse for overload relay, type of coordination "2".

SIRIUS 3RU2 Thermal Overload Relays

Accessories

Overview

Overload relays for standard applications

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

- Terminal bracket for stand-alone installation with screw or spring-type terminals for every size
- 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)

Selection and ordering data

Selection and orderi	ing data		
	Version	Size	Order No.
Terminal brackets fo	r stand-alone installation		
	Terminal brackets for overload relays with screw terminals		Screw terminals
330	For separate mounting of the overload relays; screw and snapon mounting onto TH 35 standard mounting rail	S00 S0	3RU29 16-3AA01 3RU29 26-3AA01
3RU29 16-3AA01			
3RU29 26-3AA01			
3/1029 20-3AAU I	Terminal brackets for overload relays with spring-type terminals		Spring-type terminals
	For separate mounting of the overload relays; screw and snapon mounting onto TH 35 standard mounting rail	S00 S0	3RU29 16-3AC01 3RU29 26-3AC01
3RU29 16-3AC01			
3RU29 26-3AC01			
Mechanical RESET	P. W. Alexandria I. H. and M. and	500.50	20120 00 4 4
#	Resetting plungers, holders and formers	S00, S0	3RU29 00-1A
	Pushbuttons with extended stroke (12 mm), IP65, Ø 22 mm Extension plungers For compensation of the distance between the pushbutton and the unlatching button of the relay	\$00, \$0 \$00, \$0	3SB30 00-0EA11 3SX1 335
3RU29 00-1A with pushbutton and extension plunger			
Cable releases with I	nolder for RESET		
	For Ø 6.5 mm holes in the control panel; max. control panel thickness 8 mm		
57	• Length 400 mm	S00, S0	3RU29 00-1B
	• Length 600 mm	S00, S0	3RU29 00-1C
3RU29 00-1.			

SIRIUS 3RU2 Thermal Overload Relays

Accessories

	Version	Size	Order No.
Modules for remo	te RESET, electrical		
	Operating range 0.85 $1.1 \times U_s$, power consumption AC 80 VA, DC 70 W, ON period 0.2 4 s, switching frequency 60/h		
-6	• 24 30 V AC/DC	S00, S0	3RU19 00-2AB71
Charles of the last	• 110 127 V AC/DC	S00, S0	3RU19 00-2AF71
	• 220 250 V AC/DC	S00, S0	3RU19 00-2AM71
3RU19 00-2A.71			
Sealable covers			
	For covering the setting knobs	S00, S0	3RV29 08-0P
3RV29 08-0P			