

Switching devices – Contactors and contactor assemblies – Contactor relays and relays

Coupling relays

Introduction

More information

Homepage, see www.siemens.com/relays

Industry Mall, see www.siemens.com/product?3RQ_3RS_LZ

TIA Selection Tool Cloud (TST Cloud), see www.siemens.com/tstcloud/?node=SignalConverters

Conversion tool, see www.siemens.com/conversion-tool



Video: Overview about SIRIUS coupling relays

The advantages at a glance



3RQ1



3RQ2



3RQ3

	Article No.	Page
SIRIUS 3RQ1 force-guided coupling relays, fail-safe up to SIL 3 / PL e		
Coupling relays with force-guided contacts - Widths 17.5 and 22.5 mm - Safety certification according to functional safety SIL 3 / PL e - Can be used as output extension for SIRIUS 3SK safety relays via device connectors	3RQ1	2/144
SIRIUS 3RQ2 coupling relays with industrial enclosure		
Coupling relays with relay output 1, 2 or 3 changeover contacts with wide voltage range - Also available with hard gold-plated contacts	3RQ2	2/151
SIRIUS 3RQ3 coupling relays, narrow design		
Coupling relays with relay output (not plug-in) - Width 6.2 mm, 1 CO, versions with hard gold-plated contacts optionally available - Output coupling links - Input coupling links	3RQ301 3RQ303	2/154 2/154
Coupling relays with plug-in relays - Width 6.2 mm, 1 CO, versions with hard gold-plated contacts optionally available - Output coupling links	3RQ311	2/154
Coupling relays with semiconductor output (not plug-in) - Width 6.2 mm, output 1 semiconductor, triac or transistor - Output coupling links - Input coupling links	3RQ305, 3RQ306 3RQ307	2/154 2/154

Connection methods

The contactor relays and the relays are available with screw terminals (box terminals) or with spring-loaded terminals.

The 3RQ coupling relays are supplied with screw terminals or spring-loaded (push-in) terminals. The plug-in bases for LZS/LZX coupling relays are also available with plug-in (push-in) terminals.



Screw terminals



Spring-loaded terminals, spring-loaded terminals (push-in)



Flat connectors



Plug-in terminals (push-in)

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

3RQ coupling relays: Spring-loaded terminals (push-in) with TOP-wiring

Push-in terminals are a form of spring-loaded terminals allowing fast wiring without tools for rigid conductors or conductors equipped with end sleeves.

As with other spring-loaded terminals, a screwdriver (with 3.0 x 0.5 mm blade) is required to disconnect the conductor. The same tool can also be used to wire finely-stranded or stranded conductors with no end finishing.

The advantages of the push-in terminals are found, as with all spring-loaded terminals, in speed of assembly and disassembly and vibration-proof connection. There is no need for the checking and tightening required with screw terminals.

With the TOP wiring method, the wire inlet and terminals can be reached from the front. This helps to speed up the wiring process and eliminate wiring errors.



Video: SIRIUS spring-loaded terminals – Strong, flexible, safe, fast

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SIRIUS 3RQ3 coupling relays, narrow design

Overview



SIRIUS 3RQ3 coupling relays

More information

Homepage, see www.siemens.com/relays

Industry Mall, see www.siemens.com/product?3RQ3

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Conversion tool, see www.siemens.com/conversion-tool

SIRIUS 3RQ3 coupling relays in narrow design are used for coupling control signals from and to a controller, and they are available in different versions:

- Coupling relays with relay output (not plug-in)
- Coupling relays with plug-in relays
- Coupling relays with semiconductor output (not plug-in)

Coupling relays with relay output (not plug-in)

AC and DC operation

IEC 60947-5-1

The input and output coupling relays differ with regard to the positioning of the terminals and the LEDs.

Coupling relays with plug-in relays

AC and DC operation

IEC 60947-1

The coupling relays are plug-in, so the relay can be replaced quickly at the end of its service life without detaching the wiring.

Coupling relays with semiconductor output (not plug-in)

AC and DC operation

IEC 60947-1, EN 60664-1 and EN 50005;
coupling relays with semiconductor output: EN 60747-5;
programmable controllers: IEC 61131-2

The input and output coupling relays differ with regard to the positioning of the terminals and the LEDs.

The coupling relays with semiconductor output have extremely high contact reliability, so they are especially suitable for solid-state systems.

For test purposes, versions are available with manual-off-automatic switches.

Switching devices – Contactors and contactor assemblies – Contactor relays and relays

Coupling relays

SIRIUS 3RQ3 coupling relays, narrow design

Article No. scheme

Product versions		Article number				
Coupling relays with relay output (not plug-in)		3RQ30 □ 8 – □ A □ 0 □				
Design and type of output	Output coupler, without manual/automatic switch	1				
	Input coupler	3				
Type of electrical connection	Screw terminals	1				
	Spring-loaded terminals (push-in)	2				
Control supply voltage	24 V AC/DC			B		
	115 V AC/DC			E		
	230 V AC/DC			F		
Material of switching contacts	e.g.					
	0 = AgSnO ₂					□
	1 = AgSnO ₂ hard gold-plated					□
Example		3RQ30 1 8 – 1 A B 0 1				

Product versions		Article number				
Coupling relays with relay output (not plug-in)		3RQ30 1 8 – 2 A □ 0 8 – 0 A A 0				
Railway version with extended operating range 0.7 ... 1.2 x U _s						
Control supply voltage	24 V DC			M		
	110 V DC			N		
Example		3RQ30 1 8 – 2 A M 0 8 – 0 A A 0				

Product versions		Article number				
Coupling relays with plug-in relays		3RQ31 1 8 – □ A □ 0 □				
Type of electrical connection	Screw terminals	1				
	Spring-loaded terminals (push-in)	2				
Control supply voltage	24 V AC/DC			B		
	115 V AC/DC			E		
	230 V AC/DC			F		
	24 V DC			M		
Material of switching contacts	AgSnO ₂					0
	AgSnO ₂ hard gold-plated					1
Example		3RQ31 1 8 – 1 A B 0 1				

Product versions		Article number				
Coupling relays with semiconductor output (not plug-in)		3RQ30 □ □ – □ S □ □ 0				
	Current carrying capacity of the semiconductor output				Control supply voltage	Switching voltage of the semiconductor output
Output coupler						
• Without manual/automatic switch	1 mA ... 0.5 A	5 0	□	M 5	11 ... 30 V DC	10 ... 60 V DC
	5 mA ... 2 A	5 2	□	M 3	11 ... 30 V DC	10 ... 30 V DC
	1 mA ... 2 A	5 2	□	M 4	11 ... 30 V DC	10 ... 60 V DC
	5 mA ... 2 A	5 2	□	M 5	11 ... 30 V DC	20 ... 264 V AC
	1 mA ... 3 A	5 3	□	G 3	110 ... 230 V AC/DC	10 ... 30 V DC
	5 mA ... 5 A	5 5	□	M 3	11 ... 30 V DC	10 ... 30 V DC
• With manual/automatic switch	5 mA ... 5 A	6 5	□	M 3	11 ... 30 V DC	10 ... 30 V DC
Input coupler						
	10 mA ... 0.5 A	7 0	□	B 3	11 ... 30 V AC/DC	10 ... 30 V DC
		7 0	□	G 3	110 ... 230 V AC/DC	10 ... 30 V DC
Type of electrical connection	Screw terminals			1		
	Spring-loaded terminals (push-in)			2		
Example		3RQ30 7 0 – 1 S B 3 0				

Note:

This 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.

Switching devices – Contactors and contactor assemblies – Contactor relays and relays

Coupling relays

SIRIUS 3RQ3 coupling relays, narrow design

Benefits

General

- All versions with screw terminals or spring-loaded terminals (push-in technology)
- TOP wiring with spring-loaded terminals (push-in) for quick and reliable wiring
- Low space requirements in the control cabinet thanks to a consistent width of 6.2 mm
- Reduced stockkeeping due to fewer variants
- Clearly visible functional state of the coupling relay by green LED
- Integrated reverse polarity protection and EMC suppressor diode
- Standardized accessories across the entire 3RQ3 series
- Universal bridging option using connecting combs for all terminals
- Galvanic isolation plate for isolating different voltages for neighboring units
- Clip-on labels available as set for individual labeling

Coupling relays with relay output (*not plug-in*)

- Relays fixed in enclosure for increased contact reliability
- Device variants with hard gold-plated contacts, hence high contact reliability at low currents

Coupling relays with plug-in relays

- Fast replacement of the relays with existing wiring
- Shorter installation times thanks to certified complete units
- Individual relays available as spare parts
- Device variants with hard gold-plated contacts, hence high contact reliability at low currents

Coupling relays with semiconductor output (*not plug-in*)

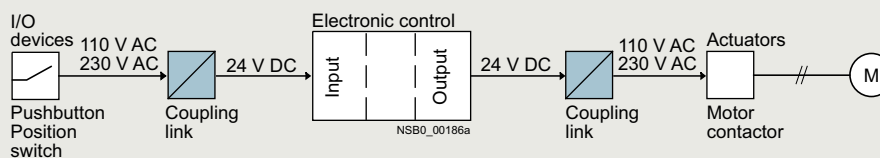
- Long service life since there is no mechanical wear
- High switching frequency thanks to short make-break times
- Vibration-resistant
- No contact bounce
- Extremely high contact reliability
- Noise-free switching
- Low control power required
- Switching of DC and capacitive loads

Note:

With semiconductors, the switching current is not dependent on the inductance of the load, i.e. the switching current for an inductive DC-13 load is the same as that for a DC-12 load. This means that coupling links with a semiconductor output are particularly suitable for inductive loads such as solenoid valves. It is not relevant to specify the number of operating cycles, because this does not affect the endurance of the semiconductor, provided it is not overheated.

Application

- Electrical separation between the input and output circuit
- Adjustment of different signal levels
- Signal amplification



Application example motor controller

Switching devices – Contactors and contactor assemblies – Contactor relays and relays

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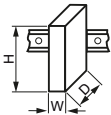
Technical specifications

More information

Technical specifications, see
<https://support.industry.siemens.com/cs/ww/en/ps/16198/td>

Operating Instructions, see
<https://support.industry.siemens.com/cs/ww/en/ps/16198/man>
 FAQs, see <https://support.industry.siemens.com/cs/ww/en/ps/16198/faq>

Coupling relays with relay output (not plug-in)

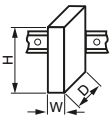
Article number		3RQ30.8- .AB00	3RQ30.8- .AB01	3RQ30.8- .AE00	3RQ30.8- .AE01	3RQ30.8- .AF00	3RQ30.8- .AF01	3RQ3018- 2AM08-0AA0	3RQ3018- 2AN08-0AA0
General technical specifications									
Width x height x depth	 mm	6.2 x 93 x 72.5							
Insulation voltage for overvoltage category III acc. to IEC 60664 for pollution degree 3	V	300							
Max. permissible voltage for protective separation between control circuit and auxiliary circuit	V	300							
Ambient temperature									
• During operation	°C	-25 ... +60						-40 ... +70	
• During storage	°C	-40 ... +85							
Degree of protection IP		IP20							
Version of the fuse link required for short-circuit protection of the auxiliary switch		Fuse gG: 4 A							
Operational current of the auxiliary contacts									
• At AC-15									
- At 24 V	A	3							
- At 250 V	A	3							
• At DC-13									
- At 24 V	A	1							
- At 125 V	A	0.2							
- At 250 V	A	0.1							
Contact reliability of the auxiliary contacts (one contact failure per 100 million)		17 V, 5 mA	5 V, 1 mA	17 V, 5 mA	5 V, 1 mA	17 V, 5 mA	5 V, 1 mA	17 V, 5 mA	
Mechanical service life (operating cycles) typical		10 000 000							
Electrical endurance (operating cycles) for AC-15 at 250 V typical		100 000							
Operating range factor of the control supply voltage, rated value									
• At AC									
- At 50 Hz		0.8 ... 1.25				0.8 ... 1.1		--	
- At 60 Hz		0.8 ... 1.25				0.8 ... 1.1		--	
• At DC		0.8 ... 1.25				0.8 ... 1.1		0.7 ... 1.25	
Active power input	W	0.3		0.5		1		0.3 0.6	
Thermal current	A	6							
• Note		--						Derating, see characteristic curves	

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SIRIUS 3RQ3 coupling relays, narrow design

Coupling relays with plug-in relays

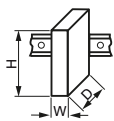
Article number		3RQ3118- .AB00	3RQ3118- .AB01	3RQ3118- .AE00	3RQ3118- .AE01	3RQ3118- .AF00	3RQ3118- .AF01	3RQ3118- .AM00	3RQ3118- .AM01
General technical specifications									
Width x height x depth	mm	6.2 x 93 x 76							
									
Insulation voltage for overvoltage category III acc. to IEC 60664 for pollution degree 3	V	300							
Max. permissible voltage for protective separation between control circuit and auxiliary circuit	V	300							
Ambient temperature									
• During operation	°C	-25 ... +60							
• During storage	°C	-40 ... +85							
Degree of protection IP		IP20							
Version of the fuse link required for short-circuit protection of the auxiliary switch		Fuse gG: 4 A							
Operational current of the auxiliary contacts									
• At AC-15									
- At 24 V	A	3							
- At 250 V	A	3							
• At DC-13									
- At 24 V	A	1							
- At 125 V	A	0.2							
- At 250 V	A	0.1							
Contact reliability of the auxiliary contacts (one contact failure per 100 million)		17 V, 5 mA	5 V, 1 mA	17 V, 5 mA	5 V, 1 mA	17 V, 5 mA	5 V, 1 mA	17 V, 5 mA	5 V, 1 mA
Mechanical service life (operating cycles) typical		10 000 000							
Electrical endurance (operating cycles) for AC-15 at 250 V typical		100 000							
Operating range factor of the control supply voltage, rated value									
• At AC									
- At 50 Hz		0.8 ... 1.25		0.8 ... 1.1				--	
- At 60 Hz		0.8 ... 1.25		0.8 ... 1.1				--	
• At DC		0.8 ... 1.25		0.8 ... 1.1				0.8 ... 1.25	
Active power input	W	0.3		0.5		1		0.3	
Thermal current	A	6							

Switching devices – Contactors and contactor assemblies – Contactor relays and relays

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SIRIUS 3RQ3 coupling relays, narrow design

Coupling relays with semiconductor output (not plug-in)

Article number		3RQ3050- .SM50	3RQ3052- .SM30	3RQ3052- .SM40	3RQ3052- .SM50	3RQ3053- .SG30	3RQ3055- .SM30	3RQ3065- .SM30	3RQ3070- .SB30	3RQ3070- .SG30	
General technical specifications											
Width x height x depth	 mm	6.2 x 93 x 72.5							6.2 x 93 x 75	6.2 x 93 x 72.5	
Insulation voltage for overvoltage category III acc. to IEC 60664 for pollution degree 3	V	50			300		50		--		
Ambient temperature											
• During operation	°C	-25 ... +60									
• During storage	°C	-40 ... +85									
Degree of protection IP		IP20									
Switching voltage of the semiconductor output											
• At AC	V	--			20 ... 264		--				
• At DC	V	10 ... 60	10 ... 30	10 ... 60	--	10 ... 30					
Current carrying capacity of the semiconductor output											
• At AC		--			5 mA ... 2 A		--				
• At DC		1 mA ... 0.5 A	5 mA ... 2 A	1 mA ... 2 A	--	1 mA ... 3 A	5 mA ... 5 A		10 mA ... 0.5 A		
Operating range factor of the control supply voltage, rated value											
• At AC											
- At 50 Hz		--					0.7 ... 1.1		--	1 ... 1	0.7 ... 1.1
- At 60 Hz		--					0.7 ... 1.1		--	1 ... 1	0.7 ... 1.1
• At DC		1 ... 1					0.7 ... 1.1		1 ... 1		0.7 ... 1.1
Active power input	W	0.3			0.25		0.3		0.5		
Thermal current	A	0.5	2				3	5	0.5		

Article number	3RQ3...-1....	3RQ3...-2....
Type of electrical connection for auxiliary and control circuits	 Screw terminals	 Spring-loaded terminals (push-in)
Type of connectable conductor cross-sections		
• Solid	1x (0.25 ... 2.5) mm ²	
• Finely stranded		
- Without end sleeves	--	1x (0.25 ... 2.5) mm ²
- With end sleeves	1x (0.25 ... 1.5) mm ²	
• Solid for AWG cables	1x (20 ... 14)	

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SIRIUS 3RQ3 coupling relays, narrow design

Selection and ordering data

Type of voltage	Control supply voltage			Number of CO contacts for auxiliary contacts	Material of switching contacts	Article No.	Weight kg
	At AC		At DC				
	At 50 Hz	At 60 Hz					
	V	V					

Coupling relays with relay output (not plug-in)

Output coupling links

AC/DC	24	24	24	1	AgSnO2	3RQ3018-□AB00	0.035
					AgSnO2 hard gold-plated	3RQ3018-□AB01	0.035
	115	115	115	1	AgSnO2	3RQ3018-□AE00	0.036
	230	230	230	1	AgSnO2	3RQ3018-□AF00	0.035
DC	--	--	24	1	AgSnO2	3RQ3018-2AM08-0AA0	0.033
			110	1	AgSnO2	3RQ3018-2AN08-0AA0	0.033

Input coupling links

AC/DC	24	24	24	1	AgSnO2	3RQ3038-□AB00	0.035
					AgSnO2 hard gold-plated	3RQ3038-□AB01	0.035
	115	115	115	1	AgSnO2	3RQ3038-□AE00	0.035
					AgSnO2 hard gold-plated	3RQ3038-□AE01	0.034
230	230	230	230	1	AgSnO2	3RQ3038-□AF00	0.035
					AgSnO2 hard gold-plated	3RQ3038-□AF01	0.035

Coupling relays with plug-in relays

Output coupling links

AC/DC	24	24	24	1	AgSnO2	3RQ3118-□AB00	0.035
					AgSnO2 hard gold-plated	3RQ3118-□AB01	0.035
	115	115	115	1	AgSnO2	3RQ3118-□AE00	0.035
					AgSnO2 hard gold-plated	3RQ3118-□AE01	0.035
230	230	230	230	1	AgSnO2	3RQ3118-□AF00	0.035
					AgSnO2 hard gold-plated	3RQ3118-□AF01	0.035
DC	--	--	24	1	AgSnO2	3RQ3118-□AM00	0.035
					AgSnO2 hard gold-plated	3RQ3118-□AM01	0.035

3RQ3018-2....
3RQ3118-2....

Type of electrical connection

- Screw terminals
- Spring-loaded terminals (push-in)

1
2

Type of voltage	Control supply voltage			Current carrying capacity of the semiconductor output		Operating mode selectable via switch position	Article No.	Weight kg
	At AC		At DC	At AC	At DC			
	At 50 Hz	At 60 Hz						

Coupling relays with semiconductor output (not plug-in)

Output coupling links

DC	--	--	11 ... 30 V	--	1 mA ... 0.5 A	--	3RQ3050-□SM50	0.031
					5 mA ... 2 A	--	3RQ3052-□SM30	0.032
					1 mA ... 2 A	--	3RQ3052-□SM40	0.031
				5 mA ... 2 A	--	--	3RQ3052-□SM50	0.034
				--	5 mA ... 5 A	--	3RQ3055-□SM30	0.032
						Manual/Off/Automatic	3RQ3065-□SM30	0.032
AC/DC	110 ... 230 V	110 ... 230 V	110 ... 230 V	--	1 mA ... 3 A	--	3RQ3053-□SG30	0.033

Input coupling links

AC/DC	11 ... 30 V	11 ... 30 V	11 ... 30 V	--	10 mA ... 0.5 A	--	3RQ3070-□SB30	0.031
	110 ... 230 V	110 ... 230 V	110 ... 230 V	--	10 mA ... 0.5 A	--	3RQ3070-□SG30	0.032

Type of electrical connection

- Screw terminals
- Spring-loaded terminals (push-in)

1
2

Switching devices – Contactors and contactor assemblies – Contactor relays and relays

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SIRIUS 3RQ3 coupling relays, narrow design

Accessories

Version	Article No.	Weight kg
Galvanic isolation plates		
 3RQ3900-0A	For electrical separation of different potentials when devices of different types are installed side by side 3RQ3900-0A	0.014
Connecting combs		
 3RQ3901-0B	For linking the same potentials, current carrying capacity for infeed max. 6 A • 2-pole • 4-pole • 8-pole • 16-pole 3RQ3901-0A 3RQ3901-0B 3RQ3901-0C 3RQ3901-0D	0.001 0.001 0.002 0.004
Clip-on labels¹⁾		
 3RQ3902-0A	For terminal and equipment labeling, white • 5 x 5 mm • 6 x 12 mm 3RQ3902-0A 3RQ3902-0B	0.009 0.017
Tools for opening spring-loaded terminals		
 3RA2908-1A	Screwdriver For all SIRIUS devices with spring-loaded terminals 3.0 mm x 0.5 mm, length approx. 200 mm, titanium gray/black, partially insulated Spring-loaded terminals (push-in) 3RA2908-1A	0.050

¹⁾ PC labeling system for individual inscription of unit labeling plates available from Conta-Clip Verbindungstechnik GmbH.

Coupling relays with plug-in relays	Control supply voltage	Material of switching contacts	Number of CO contacts for auxiliary contacts	Article No.	Weight kg
Type	V				
Replacement modules for 3RQ3118 coupling relays with plug-in relays					
3RQ3118-.AM00	24 DC	AgSnO2	1	3TX7014-7BM00	0.007
3RQ3118-.AM01		AgSnO2 hard gold-plated		3TX7014-7BM02	0.007
3RQ3118-.AB00	24 AC/DC	AgSnO2	1	3TX7014-7BM00	0.007
3RQ3118-.AB01		AgSnO2 hard gold-plated		3TX7014-7BM02	0.007
3RQ3118-.AE00	115 AC/DC	AgSnO2	1	3TX7014-7BP00	0.006
3RQ3118-.AF00	230 AC/DC	AgSnO2			
3RQ3118-.AE01	115 AC/DC	AgSnO2 hard gold-plated	1	3TX7014-7BP02	0.006
3RQ3118-.AF01	230 AC/DC	AgSnO2 hard gold-plated			