

**Price groups**

PG 41A, 41B, 41H, 41L

5/2

Introduction**Contactor relays**

- 5/5 SIRIUS 3RH2 contactor relays, 4- and 8-pole
- 5/14 3TH4 contactor relays, 8- and 10-pole
- 5/20 - Accessories for 3TH4 contactor relays
- 4/63 Contactors for railway applications
- 4/63 - SIRIUS 3RH2 contactor relays with extended operating range
- 4/66 - 3TH4 contactor relays, 8-pole

Coupling relays

- 5/21 SIRIUS 3RQ1 force-guided coupling relays, fail-safe up to SIL 3/PL e **NEW**
- 5/29 SIRIUS 3RQ2 coupling relays with industrial enclosure
- 5/33 SIRIUS 3RQ3 coupling relays, narrow design
- 5/42 LZS coupling relays with plug-in relays

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3TG10 power relays/miniature contactors

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

Introduction

Overview

More information

Homepage, see www.siemens.com/sirius

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

Industry Mall, see www.siemens.com/product?3RH_3TH

The advantages at a glance



Size
Type

S00
3RH21

S00
3RH22

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3TH42

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3TH43

	Article No.	Page
SIRIUS 3RH2 contactor relays		
4-pole		
• Screw or spring-loaded terminals	3RH21	5/10, 5/11
8-pole		
	3RH22	5/10, 5/11
4-pole, latched		
	3RH24	5/10, 5/11
Coupling contactor relays		
• Coils for control by the PLC	3RH21	5/12, 5/13
Contactor relays for railway applications		
• Coils with extended voltage range	3RH21	4/65
3TH4 contactor relays		
8-pole		
• Screw terminals	3TH42	5/17
10-pole		
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Contactor relays for railway applications		
• Coils with extended voltage range	3TH42	4/66
Accessories for SIRIUS 3RH2 contactor relays		
Auxiliary switches		
• On the front	3RH29, 3RA281.	from 3/81 onwards, 3/95
• Lateral	3RH29	3/91
Function modules (direct-on-line starting, star-delta (wye-delta) starting)		
• On the front	3RA281., 3RA283.	3/100
Surge suppressors		
• On the front	3RT2916	3/97, 3/98
Additional load modules		
• On the front	3RT2916	3/114

Note:

Safety characteristics for contactors, see "Standards and approvals", page 16/9.

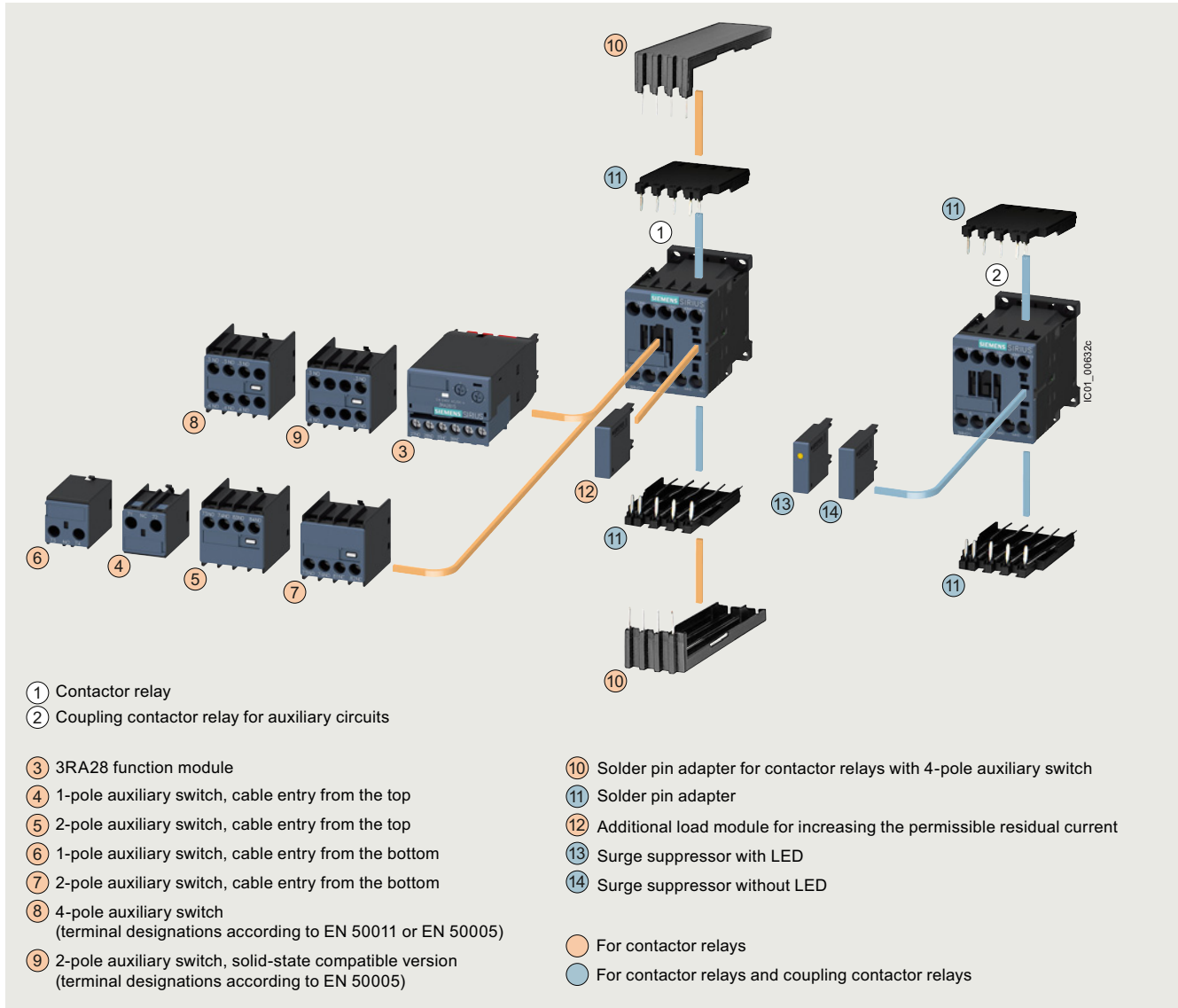
Switching devices – Contactors and contactor assemblies – Contactor relays and relays

Contactor relays

SIRIUS 3RH2 contactor relays, 4- and 8-pole

Overview

Contactor relays, size S00, with accessories



Accessories, see page 3/69 onwards.

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

Contactor relays

SIRIUS 3RH2 contactor relays, 4- and 8-pole

Standards

IEC 60947-1, IEC 60947-4-1, IEC 60947-5-1

The 3RH2 contactor relays are available with screw or spring-loaded terminals. The basic unit contains four contacts with terminal designations according to EN 50011.

The 3RH21 coupling contactor relays for switching auxiliary circuits are tailored to the special requirements of working with electronic controls.

Contact reliability of auxiliary contacts

High contact stability at low voltages and currents, suitable for solid-state circuits with currents ≥ 1 mA at a voltage of ≥ 17 V.

Protection of the device connections against overvoltage

Protection against overvoltage at the control supply voltage connection

RC elements, varistors, diodes or diode assemblies (combination of a diode and a Zener diode) can be plugged onto all 3RH2 contactor relays from the front for damping opening surges in the coil. The plug-in direction is determined by a coding device.

Coupling contactor relays have a low power consumption and an extended solenoid coil operating range.

Depending on the version, the solenoid coils of the coupling contactor relays are supplied either without overvoltage damping (versions 3RH21...-HB40 or 3RH21...-MB40-OKT0) or with a diode or suppressor diode connected as standard.

Note:

The break times of the contactor, the opening delay times of the NO contacts and the closing delay times of the NC contacts increase with damping.

For more information on how damping influences the time response, see the [Equipment Manual](#).

Accessories

The accessories for the 3RT2 contactors in size S00 can also be used for the 3RH2 contactor relays (see [page 3/69 onwards](#)).

Mounting of additional auxiliary switches

Expansion possibilities

All 3RH21 contactor relays (except for coupling contactor relays) can be expanded using auxiliary switches; the permissible configuration must be observed.

For detailed information about fitting of auxiliary switches, see [pages 3/81 to 3/86](#).

The auxiliary switch can easily be snapped onto the front of the contactor relays. The auxiliary switch has a centrally positioned release lever for disassembly.

The conventional front auxiliary contacts fulfill the characteristics of force-guided operation and are therefore suitable for safety applications.

Contactor relays in safety-related applications

Contactor relays are a significant part of safety-related applications. They are generally the actuators that perform the switching operation leading to the safe disconnection of the corresponding application or system.

Contactor relays with force-guided operation according to IEC 60947-5-1 are generally required for use in safety-related applications. Most of our contactors meet this requirement; a corresponding note can be found in the technical product data sheet.

Contactor relays with increased tamper protection

Increased tamper protection is ensured either by using our contactor relay versions with permanently mounted auxiliary switches installed in the factory (e.g. 3RH22 contactor relays), or by using the 3RT2916-4MA10 sealable cover as an accessory (see [page 3/112](#)).

Article number scheme

Product versions	Article number
SIRIUS contactor relays	3RH2 □ □ □ - □ □ □ □ 0 - □ □ □ □
Device type	e.g. 1 = 4-pole contactor relay □
Number of NO contacts	e.g. 2 = 2 NO □
Number of NC contacts	e.g. 2 = 2 NC □
Type of electrical connection	Screw terminals 1
	Spring-loaded terminals 2
Operating range/solenoid coil circuit	e.g. A = AC standard/without coil circuit □
Rated control supply voltage	e.g. P0 = 50/60 Hz 230 V AC □ □
Special version	□ □ □ □
Example	3RH2 1 2 2 - 1 A P 0 0

Note:

The article number 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

Contactor relays

SIRIUS 3RH2 contactor relays, 4- and 8-pole

Technical specifications

More information

Technical specifications, see <https://support.industry.siemens.com/cs/ww/en/ps/16188/td>
 FAQs, see <https://support.industry.siemens.com/cs/ww/en/ps/16188/faq>

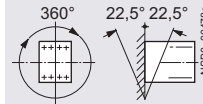
Manuals, see <https://support.industry.siemens.com/cs/ww/en/ps/16188/man>

Type
Size

Contactor relays
3RH2
S00

Permissible mounting position

The contactor relays are designed for operation on a vertical mounting surface.



Upright mounting position



Special version required

(in the case of coupling contactor relays and contactor relays with extended operating range 3RH2122-2K.40 on request)

Force-guided operation of contacts in contactor relays

3RH2:

Yes, in the basic unit and the auxiliary switch as well as between the basic unit and the mounted auxiliary switch (**removable**) according to:

- ZH1/457
- IEC 60947-5-1, Annex L

3RH22:

Yes, in the basic unit and the auxiliary switch as well as between the basic unit and the mounted auxiliary switch (**permanently mounted**) according to:

- ZH1/457
- IEC 60947-5-1, Annex L

Note:

3RH2911-.NF. solid-state-compatible auxiliary switches have no force-guided contacts.

Explanations:

There is force-guided operation if it is ensured that the NC and NO contacts cannot be closed at the same time.

ZH1/457

Safety Rules for Controls on Power-Operated Metalworking Presses.

IEC 60947-5-1, Annex L

Standard for low-voltage switchgear and controlgear; "Special requirements for mechanically linked contact elements"

Contact reliability

Contact reliability at 17 V, 1 mA according to IEC 60947-5-4

Frequency of contact faults $<10^{-8}$, i.e. <1 fault per 100 million operating cycles

Contact endurance for AC-15/AC-14 and DC-13 utilization categories

The contact endurance is mainly dependent on the breaking current. It is assumed that the operating mechanisms are switched arbitrarily and not synchronously with the phase angle of the supply system switching operating mechanism.

If magnetic circuits other than the contactor operating mechanisms or solenoid valves are present, e.g. magnetic brakes, protective measures for the load circuits are necessary, e.g. in the form of RC elements and freewheeling diodes.

The characteristic curves apply to

- 3RH21/3RH22 contactor relays¹⁾
- 3RH24 latched contactor relays
- 3RH2911 auxiliary switches¹⁾
- Auxiliary switches for snapping onto the front, max. 4-pole and for mounting on the side in size S00

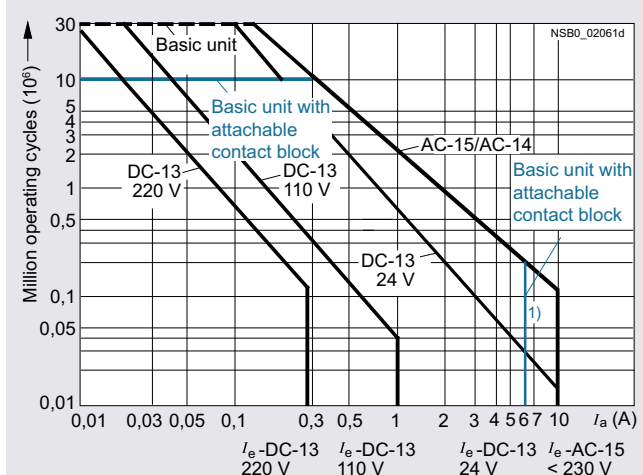


Diagram legend:

I_a = Breaking current

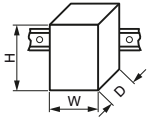


I_e = Rated operational current

¹⁾ 3RH22, 3RH2911: $I_e = 6$ A for AC-15/AC-14 and DC-13.

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

Contactor relays

SIRIUS 3RH2 contactor relays, 4- and 8-pole

		Contactor relays				
		3RH21	3RH22	3RH24		
Type		S00				
Size						
General data						
Dimensions (W x H x D)						
<ul style="list-style-type: none"> Basic units <ul style="list-style-type: none"> Screw terminals Spring-loaded terminals Basic unit with mounted auxiliary switch <ul style="list-style-type: none"> Screw terminals Spring-loaded terminals Basic unit with mounted function module or solid-state time-delay auxiliary switch <ul style="list-style-type: none"> Screw terminals Spring-loaded terminals 		mm	45 x 58 x 73	--	90 x 58 x 73	
		mm	45 x 70 x 73	--		
		mm	45 x 58 x 117		--	
		mm	45 x 70 x 121		--	
		mm	45 x 58 x 147	--		
		mm	45 x 70 x 147	--		
		Mechanical endurance				
		Basic units	Operating cycles	30 million		5 million
		Basic unit with mounted auxiliary switch	Operating cycles	10 million		5 million
		Solid-state-compatible auxiliary switch	Operating cycles	5 million		
Rated insulation voltage U_i (pollution degree 3)		V	690			
Rated impulse withstand voltage U_{imp}		kV	6			
Protective separation between coil and contacts in the basic unit, according to IEC 60947-1, Annex N		V	400			
Permissible ambient temperature						
During operation	°C	-25 ... +60				
During storage	°C	-55 ... +80				
Short-circuit protection						
Short-circuit test						
With fuse links of operational class gG: DIAZED, type 5SB; NEOZED, type 5SE with short-circuit current $I_k = 1$ kA according to IEC 60947-5-1	A	10				
With miniature circuit breakers with C characteristic with short-circuit current $I_k = 400$ A according to IEC 60947-5-1	A	6				
		Contactor relays				
		3RH21	3RH22	3RH24		
		S00				
Conductor cross-sections						
Auxiliary conductors and coil terminals (1 or 2 conductors can be connected)						
 Screw terminals						
Solid or stranded	mm ²	2 x (0.5 ... 1.5) ¹⁾ ; 2 x (0.75 ... 2.5) ¹⁾ , max. 2 x 4				
Finely stranded with end sleeve	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⁾				
Terminal screw		M3 (for Pozidriv size 2, Ø 5 ... 6 mm)				
Tightening torque	Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)				
Auxiliary conductors and coil terminals²⁾ (1 or 2 conductors can be connected)						
 Spring-loaded terminals						
Operating devices	mm	3.0 x 0.5; 3.5 x 0.5				
Solid or stranded	mm ²	2 x (0.5 ... 4)				
Finely stranded with end sleeve	mm ²	2 x (0.5 ... 2.5)				
Finely stranded without end sleeve	mm ²	2 x (0.5 ... 2.5)				
AWG cables, solid or stranded	AWG	2 x (20 ... 12)				
Auxiliary conductors for front and laterally mounted auxiliary switches²⁾						
Operating devices	mm	3.0 x 0.5; 3.5 x 0.5				
Solid or stranded	mm ²	2 x (0.5 ... 2.5)				
Finely stranded with end sleeve	mm ²	2 x (0.5 ... 1.5)				
Finely stranded without end sleeve	mm ²	2 x (0.5 ... 2.5)				
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 lie in one of the ranges specified.







²⁾ Max. external diameter of the conductor insulation: 3.6 mm.
On spring-loaded terminals with conductor cross-sections ≤ 1 mm² an insulation stop is recommended, see page 3/115.

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

Contactor relays

SIRIUS 3RH2 contactor relays, 4- and 8-pole

Type	Contactor relays		
Size	3RH2		
S00			
Control			
Solenoid coil operating range			
• AC operation	at 50 Hz	0.8 ... 1.1 x U_s	
	at 60 Hz	0.85 ... 1.1 x U_s	
• DC operation	at +50 °C	0.8 ... 1.1 x U_s	
	at +60 °C	0.85 ... 1.1 x U_s	
Power consumption of the solenoid coil (for cold coil and 1.0 x U_s)			
• AC operation, 50 Hz			
- Closing	VA/p.f.	37/0.8	
- Closed	VA/p.f.	5.7/0.25	
• AC operation, 60 Hz			
- Closing	VA/p.f.	33/0.75	
- Closed	VA/p.f.	4.4/0.25	
• DC operation	W	4.0	
Closing = Closed			
Permissible residual current of the electronics (with 0 signal)			
• For AC operation ¹⁾		< 4 mA x (230 V/ U_s)	
• For DC operation		< 10 mA x (24 V/ U_s)	
¹⁾ The 3RT2916-1GA00 additional load module is recommended for higher residual currents, see page 3/114.			

Type	Coupling contactor relays					
Size	3RH21..					
S00						
Control						
Solenoid coil operating range						
	0.7 ... 1.25 x U_s			0.85 ... 1.85 x U_s		
Power consumption of the solenoid coil (for cold coil and 1.0 x U_s) Closing = Closed at $U_s = 24$ V						
W	2.8			1.6		
Permissible residual current of the electronics with 0 signal						
	< 10 mA x (24 V/ U_s)			< 8 mA x (24 V/ U_s)		
Overvoltage configuration of the solenoid coil						
	No overvoltage damping	Integrated diode	Integrated suppressor diode	No overvoltage damping	Integrated diode	Integrated suppressor diode
						

Type	Contactor relays		
Size	3RH2		
S00			
Rated data of the auxiliary contacts			
Load rating with AC			
Rated operational currents I_e			
AC-12	A	10	
AC-15/AC-14, at rated operational voltage U_e			
	Up to 230 V	A	10 ¹⁾
	400 V	A	3
	500 V	A	2
	690 V	A	1
Ⓢ and Ⓞ rated data			
Basic units and auxiliary switches			
• Rated control supply voltage	V AC	max. 600	
• Rated voltage	V AC	600	
• Switching capacity		A 600, Q 600	
• Uninterrupted current at 240 V AC	A	10	

¹⁾ 3RH22, 3RH29: $I_e = 6$ A for AC-15/AC-14 and DC-13.

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

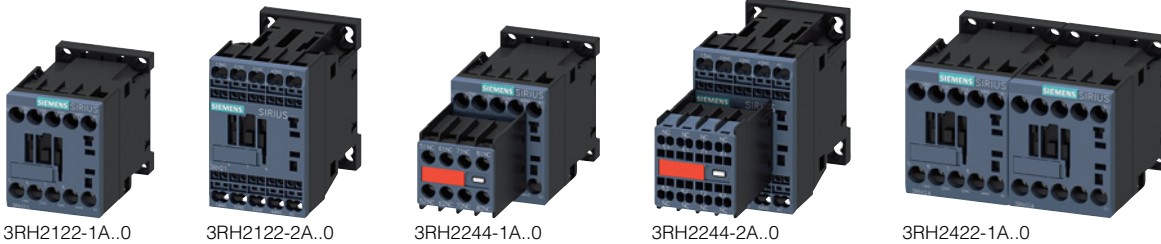
Contactor relays

SIRIUS 3RH2 contactor relays, 4- and 8-pole

Selection and ordering data

AC operation

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







3RH2122-1A..0

3RH2122-2A..0

3RH2244-1A..0

3RH2244-2A..0

3RH2422-1A..0

Rated operational current I_e /AC-15/AC-14 at 230 V	Contacts		Rated control supply voltage U_s at 50/60 Hz ¹⁾	Screw terminals 		Spring-loaded terminals 	
	Ident. No.	Version		Article No.	Price per PU	Article No.	Price per PU
A		 NO  NC	V AC				

For screw and snap-on mounting on TH 35 DIN rail

Size S00

10	40E	4	--	24 110 230	3RH2140-1AB00 3RH2140-1AF00 3RH2140-1AP00	3RH2140-2AB00 3RH2140-2AF00 3RH2140-2AP00	
	31E	3	1	24 110 230	3RH2131-1AB00 3RH2131-1AF00 3RH2131-1AP00	3RH2131-2AB00 3RH2131-2AF00 3RH2131-2AP00	
	22E	2	2	24 110 230	3RH2122-1AB00 3RH2122-1AF00 3RH2122-1AP00	3RH2122-2AB00 3RH2122-2AF00 3RH2122-2AP00	
With permanently mounted auxiliary switch							
6	44E	4	4	230	3RH2244-1AP00	3RH2244-2AP00	
	62E	6	2	230	3RH2262-1AP00	3RH2262-2AP00	
Latched							
No lateral auxiliary switches can be mounted							
10	40 E	4	--	24 110 230	3RH2440-1AB00 3RH2440-1AF00 3RH2440-1AP00	-- -- --	
	31 E	3	1	24 110 230	3RH2431-1AB00 3RH2431-1AF00 3RH2431-1AP00	-- -- --	
	22 E	2	2	24 110 230	3RH2422-1AB00 3RH2422-1AF00 3RH2422-1AP00	-- -- --	

¹⁾ Coil operating range
 - at 50 Hz: 0.8 to 1.1 x U_s
 - at 60 Hz: 0.85 to 1.1 x U_s .

Other voltages according to page 3/67 on request.

Accessories, see page 3/69 onwards.

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

Contactor relays

SIRIUS 3RH2 contactor relays, 4- and 8-pole

DC operation

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







3RH2122-1B..0

3RH2122-2B..0

3RH2244-1B..0

3RH2244-2B..0

3RH2422-1B.40

Rated operational current I_e /AC-15/AC-14 at 230 V	Contacts		Rated control supply voltage U_c	Screw terminals 		Spring-loaded terminals 	
	Ident. No.	Version		Article No.	Price per PU	Article No.	Price per PU
A		 	V DC				

For screw and snap-on mounting on TH 35 DIN rail

Size S00

10	40E	4	--	24 220	3RH2140-1BB40 3RH2140-1BM40	3RH2140-2BB40 3RH2140-2BM40	
	31E	3	1	24 220	3RH2131-1BB40 3RH2131-1BM40	3RH2131-2BB40 3RH2131-2BM40	
	22E	2	2	24 220	3RH2122-1BB40 3RH2122-1BM40	3RH2122-2BB40 3RH2122-2BM40	
With integrated coil circuit (diode integrated at the factory)							
10	40E	4	--	24	3RH2140-1FB40	3RH2140-2FB40	
	31E	3	1	24	3RH2131-1FB40	3RH2131-2FB40	
	22E	2	2	24	3RH2122-1FB40	3RH2122-2FB40	
With permanently mounted auxiliary switch							
6	44E	4	4	24	3RH2244-1BB40	3RH2244-2BB40	
	62E	6	2	24	3RH2262-1BB40	3RH2262-2BB40	
Latched							
No lateral auxiliary switches can be mounted							
10	40E	4	--	24 110 220	3RH2440-1BB40 3RH2440-1BF40 3RH2440-1BM40	-- -- --	
	31E	3	1	24 110 220	3RH2431-1BB40 3RH2431-1BF40 3RH2431-1BM40	-- -- --	
	22E	2	2	24 110 220	3RH2422-1BB40 3RH2422-1BF40 3RH2422-1BM40	-- -- --	

Other voltages according to page 3/67 on request.

Accessories, see page 3/69 onwards.

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

Contactor relays

SIRIUS 3RH2 contactor relays, 4- and 8-pole

DC operation for direct control by PLC

- Coupling contactor relays with adapted power consumption
- Suitable for solid-state PLC outputs
- Cannot be expanded with auxiliary switches



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

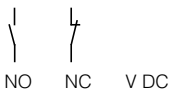


3RH21..-1.B40



3RH21..-2.B40

Rated operational current I_e /AC-15/ AC-14 at 230 V	Auxiliary contacts		Rated control supply voltage U_s	Screw terminals 		Spring-loaded terminals 	
	Ident. No. according to EN 50011	Version		Article No.	Price per PU	Article No.	Price per PU



A

For screw and snap-on mounting on TH 35 DIN rail

Size S00

Cannot be expanded with auxiliary switches

Operating range **0.7 to 1.25 x U_s** ,
 power consumption of the solenoid coils **2.8 W** at 24 V

10	40E	4	--	24
	31E	3	1	24
	22E	2	2	24

Operating range **0.85 to 1.85 x U_s** ,
 power consumption of the solenoid coils **1.6 W** at 24 V

10	40E	4	--	24
	31E	3	1	24
	22E	2	2	24

Other voltages according to page 3/67 on request.

Accessories, see page 3/69 onwards.

3RH2140-1HB40
3RH2131-1HB40
3RH2122-1HB40
3RH2140-1MB40-0KT0
3RH2131-1MB40-0KT0
3RH2122-1MB40-0KT0

3RH2140-2HB40
3RH2131-2HB40
3RH2122-2HB40
3RH2140-2MB40-0KT0
3RH2131-2MB40-0KT0
3RH2122-2MB40-0KT0

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

Contactor relays

SIRIUS 3RH2 contactor relays, 4- and 8-pole

DC operation for direct control by PLC

- Coupling contactor relays with adapted power consumption
- Suitable for solid-state PLC outputs
- Cannot be expanded with auxiliary switches



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



3RH21...-1.B40



3RH21...-2.B40

Rated operational current I_e /AC-15/ AC-14 at 230 V	Auxiliary contacts		Rated control supply voltage U_s	Screw terminals 		Spring-loaded terminals 	
	Ident. No. according to EN 50011	Version		Article No.	Price per PU	Article No.	Price per PU

A   V DC

For screw and snap-on mounting on TH 35 DIN rail

Size S00

With integrated coil circuit (diode integrated at factory)

Cannot be expanded with auxiliary switches

Operating range **0.7 to 1.25 x U_s**

Power consumption of the solenoid coils **2.8 W** at 24 V

10	40E	4	--	24
	31E	3	1	24
	22E	2	2	24

Operating range **0.85 to 1.85 x U_s**

Power consumption of the solenoid coils **1.6 W** at 24 V

10	40E	4	--	24
	31E	3	1	24
	22E	2	2	24

With integrated coil circuit (suppressor diode integrated at factory)

Cannot be expanded with auxiliary switches

Operating range **0.7 to 1.25 x U_s**

Power consumption of the solenoid coils **2.8 W** at 24 V

10	40E	4	--	24
	31E <td>3</td> <td>1</td> <td>24</td>	3	1	24
	22E	2	2	24

Operating range **0.85 to 1.85 x U_s**

Power consumption of the solenoid coils **1.6 W** at 24 V

10	40E	4	--	24
	31E <td>3</td> <td>1</td> <td>24</td>	3	1	24
	22E	2	2	24

Other voltages according to page 3/67 on request.

Accessories, see page 3/69 onwards.

3RH2140-1JB40
 3RH2131-1JB40
 3RH2122-1JB40

3RH2140-2JB40
 3RH2131-2JB40
 3RH2122-2JB40

3RH2140-1VB40
 3RH2131-1VB40
 3RH2122-1VB40

3RH2140-2VB40
 3RH2131-2VB40
 3RH2122-2VB40

3RH2140-1KB40
 3RH2131-1KB40
 3RH2122-1KB40

3RH2140-2KB40
 3RH2131-2KB40
 3RH2122-2KB40

3RH2140-1SB40
 3RH2131-1SB40
 3RH2122-1SB40

3RH2140-2SB40
 3RH2131-2SB40
 3RH2122-2SB40