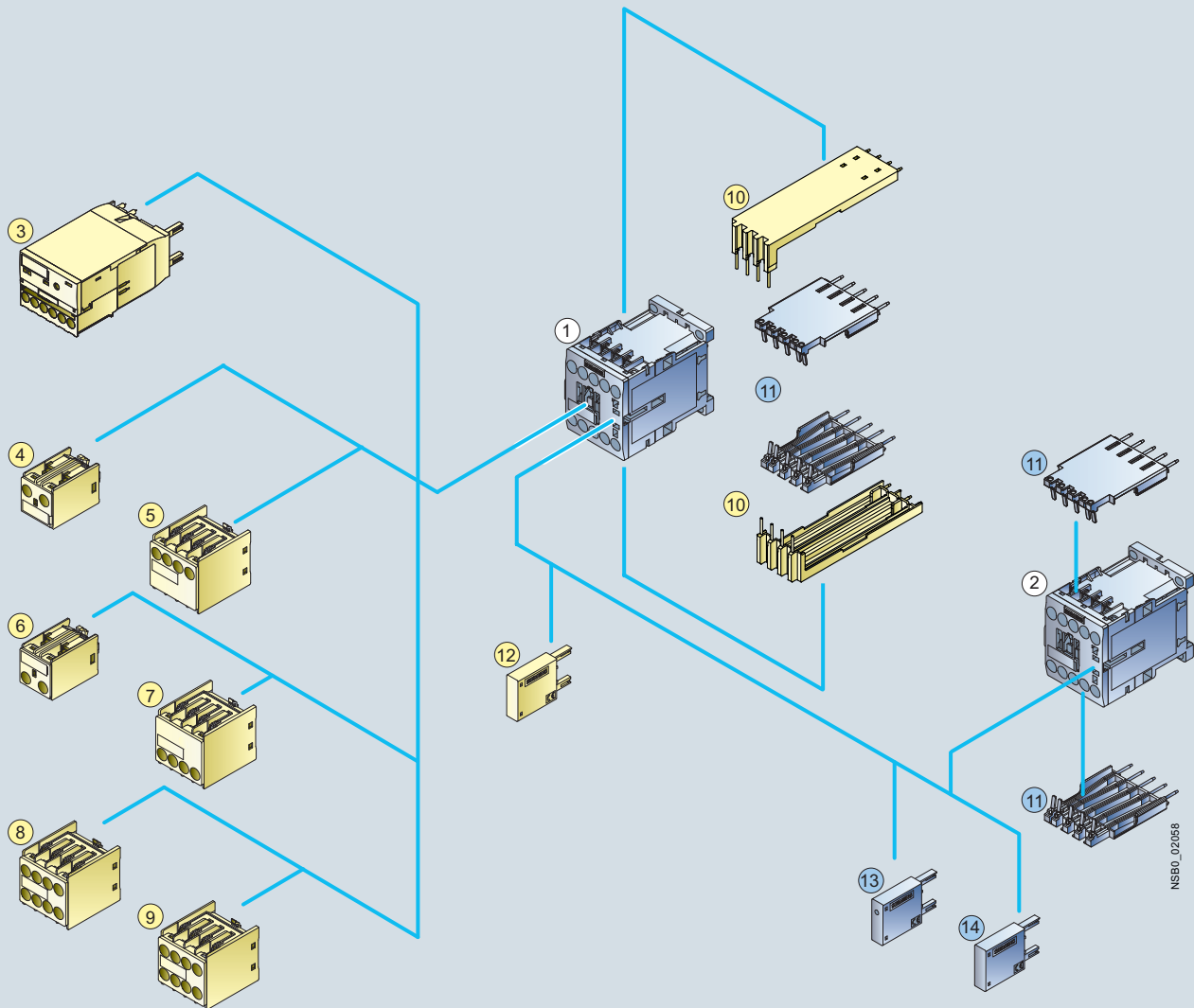


Contactors Relays

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

Overview

Contactors relays and coupling relays Size S00 with accessories



- ① Contactor relay
- ② Coupling relay for auxiliary circuits
- ③ Solid-state timing relay block
- ④ 1-pole auxiliary switch block, cable entry from the top
- ⑤ 2-pole auxiliary switch block, cable entry from the top
- ⑥ 1-pole auxiliary switch block, cable entry from the bottom
- ⑦ 2-pole auxiliary switch block, cable entry from the bottom
- ⑧ 4-pole auxiliary switch block
(terminal designations according to EN 50011 or EN 50005)
- ⑨ 2-pole auxiliary switch block, solid-state compatible version
(terminal designations according to EN 50005)
- ⑩ Solder pin adapter for contactor relays with 4-pole auxiliary switch block
- ⑪ Solder pin adapter for contactor and coupling relays
- ⑫ Additional load module for increasing the permissible residual current
- ⑬ Surge suppressor with LED
- ⑭ Surge suppressor without LED

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

Standards

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

The 3RH2 contactor relays have screw, ring terminal lug or spring-type terminals. The basic unit contains four contacts with terminal designations according to EN 50011.

The 3RH2 contactor relays are suitable for use in any climate. They are finger-safe according to EN 50274. The devices with ring terminal lug connection comply with degree of protection IP20 when fitted with the related terminal cover.

Contact reliability

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

Surge suppression

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.

Note:

The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (noise suppression diode 6 to 10 times; diode assembly 2 to 6 times, varistor +2 to 5 ms).

Accessories

The accessories for the 3RT2 contactors in size S00 can also be used for the 3RH2 contactor relays (see pages 5/13 and 5/14 and also Chapter 3).

Article No. scheme

Digit of the article No.	1st - 3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	16th	
	□□□	□	□	□	□	-	□	□	□	□	-	□	□	□	
SIRIUS contactor relays	3 R H														
2nd generation	2														
Device type (e.g. 1 = 4-pole contactor relay, 2 = 8-pole contactor relay)	□														
Number of NO contacts (e.g. 2 = 2 NO)	□														
Number of NC contacts (e.g. 2 = 2 NC)	□														
Connection type (1 = screw, 2 = spring)	□														
Operating range / solenoid coil circuit (e.g. A = AC standard / without)	□														
Rated control supply voltage (e.g. P0 = 230 V, 50 Hz)	□ □														
No significance	□														
Special version	□ □ □ □														
Example	3 R H	2	1	2	2	-	1	A	P	0	0				

Note:

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

Auxiliary switch blocks

The 3RH21 contactor relays can be expanded by up to four contacts by the addition of snap-on auxiliary switch blocks.

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

Auxiliary switches according to EN 50011

The 3RH2911-.GA .. auxiliary switch blocks are available for terminal designations according to EN 50011 or IEC 60947-5-1 (see page 5/12). They are coded, and therefore cannot be combined with contactor relays with identification numbers 31E or 22E.

In addition, fully mounted 3RH22 8-pole contactor relays are available; the mounted 4-pole auxiliary switch block is not removable. These versions are built according to special Swiss regulations SUVA and are distinguished externally by a red labeling plate.

Auxiliary switches according to EN 50005

All contactor relays with the identification numbers 40E, 31E and 22E can be extended with auxiliary switch blocks to obtain contactor relays with 5 to 8 contacts. The permissible combinations and the resulting identification numbers can be found in the selection tables in Chapter 3, pages 3/48 to 3/52.

Of the auxiliary contacts (integrated plus mountable) possible on the device, no more than four NC contacts are permitted.

Manuals

For more information, see

- System manual "SIRIUS Innovations – System Overview", <http://support.automation.siemens.com/WW/view/en/60311318>
- Manual "SIRIUS Innovations – SIRIUS 3RT2 Contactors/ Contactor Assemblies", <http://support.automation.siemens.com/WW/view/en/60306557>

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

Contactor Relays

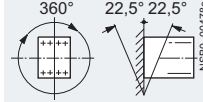
SIRIUS 3RH2 contactor relays, 4- and 8-pole

Technical specifications

Contactor relays	Type	3RH2
	Size	S00

Permissible mounting position

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



Upright mounting position



Special version required
(3RH2122-2K.40 coupling relays and contactor relays with extended operating range on request)

Positively-driven operation of contacts in contactor relays

3RH2:
Yes, in the basic unit and the auxiliary switch block as well as between the basic unit and the front-mounted auxiliary switch block (removable) according to:

- ZH 1/457
- IEC 60947-5-1, Appendix L

3RH22:
Yes, in the basic unit and the auxiliary switch block as well as between the basic unit and the snap-on auxiliary switch block (permanently mounted) according to:

- ZH 1/457
- IEC 60947-5-1, Appendix L

Note:
3RH2911-.NF. solid-state compatible auxiliary switch blocks have no positively-driven contacts.

Explanations:
There is positively-driven 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, Appendix L
Low-voltage switchgear and controlgear, Special requirements for positively-driven contacts

Contact reliability

Contact reliability at 17 V, 1 mA acc. 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 randomly, i.e. not synchronized with the phase angle of the supply system.

If magnetic circuits other than the contactor coil systems 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 free-wheel diodes.

The characteristic curves apply to:

- 3RH21/3RH22 contactor relays¹⁾
- 3RH24 latched contactor relays
- 3RH2911 auxiliary switch blocks¹⁾
- Auxiliary switch blocks for snapping onto the front, max. 4-pole and for mounting onto the side in size S00

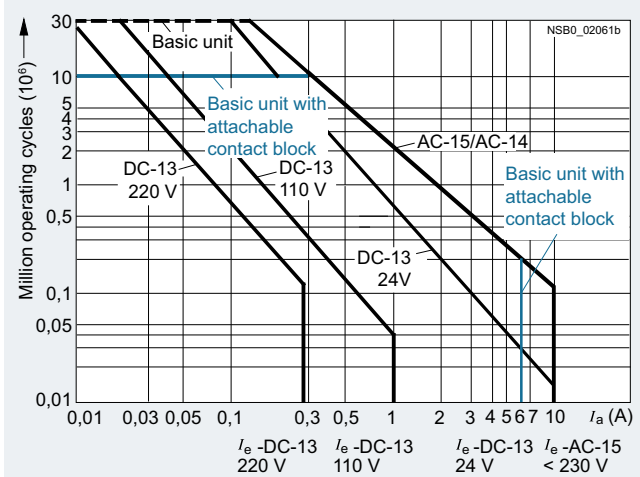
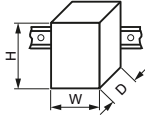



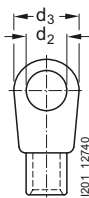


Diagram legend:
 I_a = Breaking current
 I_e = Rated operational current

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

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

Type		3RH21	3RH22	3RH24
Size		S00	S00	S00
Dimensions (W x H x D) with screw terminals		45 x 57.5 x 73	--	90 x 57.5 x 73
• With mounted auxiliary switch block		45 x 57.5 x 116	45 x 57.5 x 116	--
General technical specifications				
Mechanical endurance				
• Basic units	Operating cycles	30 million		5 million
• Basic unit with snap-on auxiliary switch block	Operating cycles	10 million		5 million
• Solid-state compatible auxiliary switch block	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 the coil and the contacts in the basic unit acc. to IEC 60947-1, Appendix N	V	400		
Permissible ambient temperature				
• During operation	°C	-25 ... +60		
• During storage	°C	-55 ... +80		
Degree of protection acc. to IEC 60947-1, Appendix C		IP20		
Touch protection acc. to EN 50274		Finger-safe		
Shock resistance				
• Rectangular pulse	- AC operation	g/ms	7.3/5 and 4.7/10	
	- DC operation	g/ms	10/5 and 5/10	
• Sine pulse	- AC operation	g/ms	11.4/5 and 7.3/10	
	- DC operation	g/ms	15/5 and 8/10	
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 acc. to IEC 60947-5-1	A	10		
• Test with miniature circuit breaker with C characteristic with short-circuit current $I_k = 400$ A acc. to IEC 60947-5-1	A	6		
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 conductor and coil terminals²⁾ (1 or 2 conductors can be connected)			 Spring-type terminals	
• Operating devices ³⁾	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⁾			 Ring terminal lug connections	
Operating devices ³⁾	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)		
Auxiliary conductor and coil terminals				
• Terminal screw	mm	M3, Pozidriv size 2		
• Operating devices	Nm	Ø 5 ... 6		
• Tightening torque	mm	0.8 ... 1.2		
• Usable ring terminal lugs	mm	d ₂ = min. 3.2		
- DIN 46234 without insulation sleeve	mm	d ₃ = max. 7.5		
- 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 lie in one of the ranges specified.

²⁾ Max. external diameter of the conductor insulation: 3.6 mm. An insulation stop must be used for spring-type terminals with conductor cross-sections ≤ 1 mm²; see "Accessories", page 5/14.

³⁾ Tool for opening the spring-type terminals; see "Accessories", page 5/14.

Contactors Relays

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

Contactor relays	Type	3RH2.
	Size	S00
Control circuit		
Solenoid coil operating range		
• AC operation	At 50 Hz	0.8 ... 1.1 × U_s
	At 60 Hz	0.85 ... 1.1 × U_s
• DC operation	At 50 °C	0.8 ... 1.1 × U_s
	At +60 °C	0.85 ... 1.1 × U_s
Power consumption of the solenoid coils (for cold coil and 1.0 × 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 closing = closed	W	4.0
Permissible residual current of the electronics (with 0 signal)		
• For AC operation ¹⁾		< 4 mA × (230 V/ U_s)
• For DC operation		< 10 mA × (24 V/ U_s)
Operating times²⁾ (Total break time = OFF-delay + Arcing time) Values apply with coil in cold state and at operating temperature for operating range		
<u>AC operation</u>		
• Closing		
- ON-delay of NO contact	With 0.8 ... 1.1 × U_s ms With 1.0 × U_s ms 3RH24 minimum operating time ms	8 ... 33 9 ... 22 ≥ 35
- OFF-delay of NC contact	With 0.8 ... 1.1 × U_s ms With 1.0 × U_s ms	6 ... 25 6.5 ... 19
• Opening		
- OFF-delay of NO contact	With 0.8 ... 1.1 × U_s ms With 1.0 × U_s ms 3RH24 minimum operating time ms	4 ... 15 4.5 ... 15 ≥ 30
- ON-delay of NC contact	With 0.8 ... 1.1 × U_s ms With 1.0 × U_s ms	5 ... 15 5 ... 15
<u>DC operation</u>		
• Closing		
- ON-delay of NO contact	With 0.8 ... 1.1 × U_s ms With 1.0 × U_s ms 3RH24 minimum operating time ms	30 ... 100 35 ... 50 ≥ 100
- OFF-delay of NC contact	With 0.8 ... 1.1 × U_s ms With 1.0 × U_s ms	25 ... 90 30 ... 45
• Opening		
- OFF-delay of NO contact	With 0.8 ... 1.1 × U_s ms With 1.0 × U_s ms 3RH24 minimum operating time ms	7 ... 13 7 ... 12 ≥ 30
- ON-delay of NC contact	With 0.8 ... 1.1 × U_s ms With 1.0 × U_s ms	13 ... 19 13 ... 18
• Arcing time		ms 10 ... 15
Dependence of the switching frequency z' on the operational current I' and operational voltage U' : $z' = z \cdot I_e / I' \cdot (U_e / U')^{1.5} \cdot 1/h$		

¹⁾ The 3RT2916-1GA00 additional load module is recommended for higher residual currents; (see page 5/13).

²⁾ The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (noise suppression diode 6 to 10 times; diode assembly 2 to 6 times, varistor +2 to 5 ms).

Contactor relays	Type	3RH2.
	Size	S00
Load side		
Load rating with AC		
Rated operational currents I_e		
AC-12	A	10
AC-15/AC-14 for rated operational voltage U_s	Up to 230 V A	10 ¹⁾
	400 V A	3
	500 V A	2
	690 V A	1
Load rating with DC		
Rated operational currents I_e		
DC-12 for rated operational voltage U_s		
• 1 conducting path	24 V A	10
	60 V A	6
	110 V A	3
	220 V A	1
	440 V A	0.3
	600 V A	0.15
• 2 conducting paths in series	24 V A	10
	60 V A	10
	110 V A	4
	220 V A	2
	440 V A	1.3
	600 V A	0.65
• 3 conducting paths in series	24 V A	10
	60 V A	10
	110 V A	10
	220 V A	3.6
	440 V A	2.5
	600 V A	1.8
DC-13 for rated operational voltage U_s		
• 1 conducting path	24 V A	10 ¹⁾
	60 V A	2
	110 V A	1
	220 V A	0.3
	440 V A	0.14
	600 V A	0.1
• 2 conducting paths in series	24 V A	10
	60 V A	3.5
	110 V A	1.3
	220 V A	0.9
	440 V A	0.2
	600 V A	0.1
• 3 conducting paths in series	24 V A	10
	60 V A	4.7
	110 V A	3
	220 V A	1.2
	440 V A	0.5
	600 V A	0.26
Switching frequency		
Switching frequency z in operating cycles/hour		
• For rated operation	AC-12/DC-12	h ⁻¹ 1 000
For utilization category	AC-15/AC-14	h ⁻¹ 1 000
	DC-13	h ⁻¹ 1 000
• No-load switching frequency		h ⁻¹ 10 000
Dependence of the switching frequency z' on the operational current I' and operational voltage U :		
$z' = z \cdot I_e / I' \cdot (U_e / U)^{1.5} \cdot 1/h$		
Ⓢ and Ⓛ rated data		
Basic units and auxiliary switch blocks		
• 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.