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).

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

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.

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

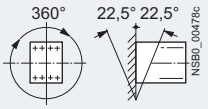
SIRIUS 3RH2 contactor relays, 4- and 8-pole

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 relays[1)]
- 3RH24 latched contactor relays
- 3RH2911 auxiliary switch blocks[1)]
- Auxiliary switch blocks for snapping onto the front, max. 4-pole and for mounting onto the side in size S00

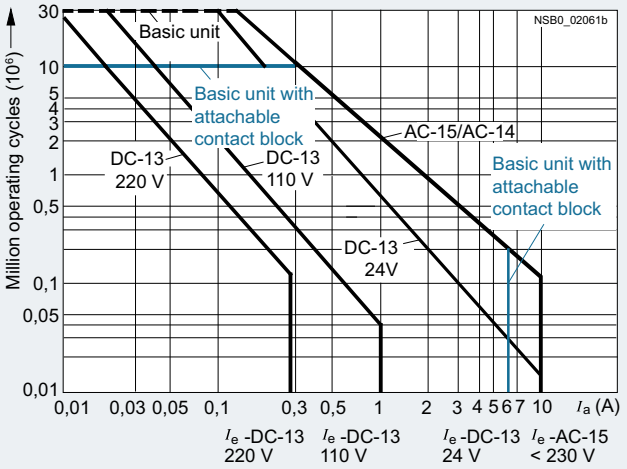
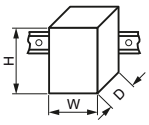
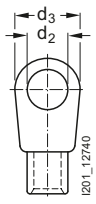


Diagram legend:
I_a = Breaking current
I_e = Rated operational current

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

Type			**3RH21**	**3RH22**	**3RH24**
Size			**S00**	**S00**	**S00**
Dimensions (W x H x D) with screw terminals		mm	45 x 57.5 x 73	--	90 x 57.5 x 73
• With mounted auxiliary switch block		mm	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, ∅ 5 ... 6 mm)		
- Tightening torque		Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)		
Auxiliary conductor and coil terminals[2] (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 switches[2]					
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			**Ring terminal lug connections**		
• 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 - 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		mm	d_3 = max. 7.5		

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 mm^2; see "Accessories", page 5/14.

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

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 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 coils (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 closing = closed			W	4.0
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)
Operating times[2] (Total break time = OFF-delay + Arcing time)				
Values apply with coil in cold state and at operating temperature for operating range				
AC operation				
• Closing				
- ON-delay of NO contact	With 0.8 ... 1.1 x U_s		ms	8 ... 33
	With 1.0 x U_s		ms	9 ... 22
	3RH24 minimum operating time		ms	≥ 35
- OFF-delay of NC contact	With 0.8 ... 1.1 x U_s		ms	6 ... 25
	With 1.0 x U_s		ms	6.5 ... 19
• Opening				
- OFF-delay of NO contact	With 0.8 ... 1.1 x U_s		ms	4 ... 15
	With 1.0 x U_s		ms	4.5 ... 15
	3RH24 minimum operating time		ms	≥ 30
- ON-delay of NC contact	With 0.8 ... 1.1 x U_s		ms	5 ... 15
	With 1.0 x U_s		ms	5 ... 15
DC operation				
• Closing				
- ON-delay of NO contact	With 0.8 ... 1.1 x U_s		ms	30 ... 100
	With 1.0 x U_s		ms	35 ... 50
	3RH24 minimum operating time		ms	≥ 100
- OFF-delay of NC contact	With 0.8 ... 1.1 x U_s		ms	25 ... 90
	With 1.0 x U_s		ms	30 ... 45
• Opening				
- OFF-delay of NO contact	With 0.8 ... 1.1 x U_s		ms	7 ... 13
	With 1.0 x U_s		ms	7 ... 12
	3RH24 minimum operating time		ms	≥ 30
- ON-delay of NC contact	With 0.8 ... 1.1 x U_s		ms	13 ... 19
	With 1.0 x U_s		ms	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 For utilization category	AC-12/DC-12	h^{-1}	1 000
	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':			
$z' = z \cdot I_e/I' \cdot (U_e/U')^{1.5} \cdot 1/h$			
CSA and UL 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.

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

Selection and ordering data

AC operation

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

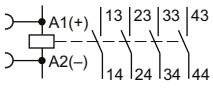
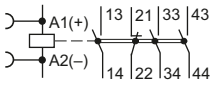
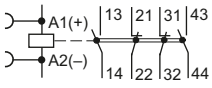
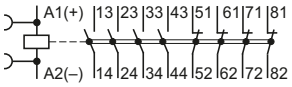
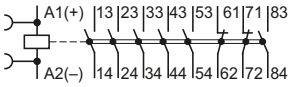
Size S00


3RH2122-1A..0


3RH2122-2A..0


3RH2244-1A..0


3RH2244-2A..0

Rated operational current I_e/AC-15/AC-14 at **230 V**	Contacts Ident. No.	Version		Rated control supply voltage U_s at 50/60 Hz[2]	DT	**Screw terminals**[1] Article No.	Price per PU	DT	**Spring-type terminals** Article No.	Price per PU
A		NO	NC	V AC						
For screw fixing and snap-on mounting onto TH 35 standard mounting rail										
Terminal designations according to EN 50011										
4 NO, Ident. No. **40E** 										
10	**40E**	4	--	24	▶	**3RH2140-1AB00**		B	**3RH2140-2AB00**	
				110	▶	**3RH2140-1AF00**		B	**3RH2140-2AF00**	
				230	▶	**3RH2140-1AP00**		▶	**3RH2140-2AP00**	
	31E	3	1	24	▶	**3RH2131-1AB00**		B	**3RH2131-2AB00**	
				110	▶	**3RH2131-1AF00**		▶	**3RH2131-2AF00**	
				230	▶	**3RH2131-1AP00**		▶	**3RH2131-2AP00**	
	22E	2	2	24	▶	**3RH2122-1AB00**		B	**3RH2122-2AB00**	
				110	▶	**3RH2122-1AF00**		▶	**3RH2122-2AF00**	
				230	▶	**3RH2122-1AP00**		▶	**3RH2122-2AP00**	
3 NO + 1 NC, Ident. No. **31E** 										
2 NO + 2 NC, Ident. No. **22E** 										
• With permanently mounted auxiliary switch block										
4 NO + 4 NC, Ident. No. **44E** 										
6 NO + 2 NC, Ident. No. **62E** 										
6	**44E**	4	4	230	▶	**3RH2244-1AP00**		A	**3RH2244-2AP00**	
	62E	6	2	230	▶	**3RH2262-1AP00**		A	**3RH2262-2AP00**	

[1] The 3RH21/3RH22 contactor relays are also available with ring terminal lug connection. Please contact your local Siemens representative for information about the special contactor versions with ring terminal lug connection.

[2] 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 5/12 on request.

Accessories see pages 5/12 to 5/14 and "Accessories for 3RT2 Contactors", Chapter 3.

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

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

Options

Rated control supply voltages (change of 10th and 11th digit of the Article No.)

Rated control supply voltage U_s	Contactor type Control supply voltage at	3RH21, 3RH22
AC operation		
Solenoid coils for 50/60 Hz and 60 Hz		
50/60 Hz[1]	**60 Hz**	
24 V AC	--	B0
42 V AC	--	D0
48 V AC	--	H0
110 V AC	--	F0
220 V AC	--	N2
230 V AC	--	P0
400 V AC	--	V0
Solenoid coils for USA and Canada[2]		
50 Hz	**60 Hz**	
110 V AC	120 V AC	K6
220 V AC	240 V AC	P6
Solenoid coils for Japan[3]		
50/60 Hz	**60 Hz**	
100 V AC	110 V AC	G6
200 V AC	220 V AC	N6
400 V AC	440 V AC	R6

Rated control supply voltage U_s	Contactor type Control supply voltage at	3RH21, 3RH22
DC operation		
12 V DC		A4
24 V DC		B4
42 V DC		D4
48 V DC		W4
60 V DC		E4
110 V DC		F4
125 V DC		G4
220 V DC		M4
230 V DC		P4

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.

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

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

Accessories

The auxiliary switch blocks according to EN 50011 listed here should preferably be used for 3RH2 contactor relays.

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

For auxiliary switch blocks and solid-state compatible auxiliary switch blocks according to EN 50005 see "Accessories for 3RT2 Contactors", Chapter 3.

3RH2911-1GA22

3RH2911-2GA22

For contactor relays Type	Contactor relays with AS block Ident. No.	Auxiliary contacts Version NO	NC		DT	Screw terminals Article No.	Price per PU	DT	Spring-type terminals Article No.	Price per PU
Auxiliary switch blocks for snapping onto the front acc. to EN 50011										
Blocks for the assembly of contactor relays with 8 contacts[1]										
3RH2140, 3RH2440, Ident. No. 40E	**80E**	4	--	53 63 73 83 / 54 64 74 84	▶	**3RH2911-1GA40**		▶	**3RH2911-2GA40**	
	71E	3	1	53 61 73 83 / 54 62 74 84	▶	**3RH2911-1GA31**		▶	**3RH2911-2GA31**	
	62E	2	2	53 61 71 83 / 54 62 72 84	▶	**3RH2911-1GA22**		▶	**3RH2911-2GA22**	
	53E	1	3	53 61 71 81 / 54 62 72 82	▶	**3RH2911-1GA13**		▶	**3RH2911-2GA13**	
	44E	--	4	51 61 71 81 / 52 62 72 82	▶	**3RH2911-1GA04**		▶	**3RH2911-2GA04**	

1) The 3RH2911-.GA.. auxiliary switches are also available with ring terminal lug connection. The 8th digit of the Article No. must be changed from a **"1"** to a **"4"**, e.g. 3RH2911-**1**GA22 ➞ 3RH2911-**4**GA22.

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