Contents

Miniature PCB Relay PE

1 pole 5 A

- 1 C/O
- Cadmium-free contacts
- Sensitive coil 200 mW
- 4 kV coil-contact
- Low height 10.0 mm

Miniature PCB Relay PE bistable

1 pole 5 A
polarized bistable version

- 1 C/O
- Bistable with 1 coil
- 4 kV coil-contact
- Low height 10.0 mm

Miniature PCB Relay RE

1 pole 6 A

- 1 N/O
- Sensitive coil 200 mW
- 4 kV coil-contact
- Optimized height 10.6 mm
- PCB area 200 mm²
- Wash tight

Contacts			
Configuration	1 C/O	1 C/O	1 N/O
Rated current	5 A	5 A	6 A
Rated voltage	250 Vac	250 Vac	250 Vac
Breaking capacity	1250 VA	1250 VA	1500 VA
Coil			
Nominal voltage	5...48 Vdc	3...48 Vdc	5...48 Vdc
Nominal coil power	200 mW	360 mW	200 mW
Other coil versions	-	-	-
Insulation			
Dielectric strength	4000 V_{rms}	4000 V_{rms}	4000 V_{rms}
Clearance / creepage	3.2 / 4 mm	3.2 / 4 mm	4 / 4 mm
General data			
Ambient temperature max.	+85 °C	+70 °C	+70 °C
Standard versions	flux proof, wash tight	flux proof, wash tight	wash tight
Terminals	PCB	PCB	PCB
Dimensions l x w x h	20 x 10 x 10 mm	20 x 10 x 10 mm	20 x 10 x 10.6 mm

PCB Power Relays

Slim PCB Relay SNR

1 pole 6 A

- 1 C/O or 1 N/O
- Only 5 mm wide
- Cadmium-free contacts
- Sensitive coil 170 mW
- 4 kV coil-contact
- 6/8 mm creepage/clearance
- Protection class II

1 C/O or 1 N/O
6 A
250 Vac
1500 VA
5...48 Vdc
170 mW
-
4000 V_{rms}
6 / 8 mm
+85 °C
wash tight
PCB
28 x 5 x 15 mm

Miniature Power PCB Pealy RY II

1 pole 8 A

- 1 C/O or 1 N/O or 1 N/C
- 5 kV / 8 mm coil-contact
- Protection class II (VDE 0700)
- Low height 12.3 mm
- Pinnings: 3.2 and 5 mm
- Sockets with PCB-type or screw-type terminals

1 C/O or 1 N/O or 1 N/C
8 A
250 Vac
2000 VA
5...48 Vdc
220 mW
-
5000 V_{rms}
8 / 8 mm
+85 °C
flux proof, wash tight
PCB
28.5 x 10.1 x 12.3 mm

Power PCB Relay RT1

1 pole 12 A / 16 A
DC- or AC-coil

- 1 C/O or 1 N/O
- Sensitive coil 400 mW, 0.75 VA
- 5 kV/10 mm coil-contact
- Protection class II
- Ambient temperature 85 °C (DC-coil)
- Height 15.7 mm

1 C/O or 1 N/O	
12 A	16 A
250 Vac	
3000 VA	4000 VA
5...110 Vdc	24...230 Vac
400 mW	0.75 VA
-	
5000 V_{rms}	
10 / 10 mm	
DC: +85 °C	AC: +70 °C
flux proof, wash tight	
PCB	
29 x 12.7 x 15.7 mm	

Power PCB Relay RT1 bistable

1 pole 16 A
polarized bistable version

- 1 C/O
- Bistable with 1 or 2 coils
- 5 kV/10 mm coil-contact
- Height 15.7 mm
- Cadmium-free contacts
- Protection class II (VDE 0700)

1 C/O
16 A
250 Vac
4000 VA
5...24 Vdc
400 / 600 mW
-
5000 V_{rms}
10 / 10 mm
+85 °C
flux proof
PCB
29 x 12.7 x 15.7 mm

Power PCB Relay RT1 sensitive

1 pole 10 A,
highly sensitive version

- 1 C/O or 1 N/O
- Sensitive coil 250 mW
- 5 kV / 10 mm coil-contact
- Protection class II (VDE 0700)
- Ambient temperature 85 °C at rated load
- Height 15.7 mm

Power PCB Relay RT1 Inrush

1 pole 16 A, for inrush peak currents up to 80 A

- 1 N/O
- Sensitive coil 400 mW
- 5 kV / 10 mm coil-contact
- Protection class II (VDE 0700)
- Ambient temperature 85 °C
- Height 15.7 mm

Power PCB Relay RTH 105 °C sensitive

1 pole 10 A,
high-temperature version

- 1 N/O
- Sensitive coil 250 mW
- 5 kV / 10 mm coil-contact
- Protection class II (VDE 0700)
- Ambient temperature 105 °C at rated load
- Height 15.7 mm

Contacts			
Configuration	1 C/O or 1 N/O	1 N/O	1 N/O
Rated current	10 A	16 A	10 A
Rated voltage	250 Vac	250 Vac	250 Vac
Breaking capacity	2500 VA	4000 VA	2500 VA
Coil			
Nominal voltage	5...60 Vdc	5...110 Vdc	5...60 Vdc
Nominal coil power	250 mW	400 mW	250 mW
Other coil versions	-	-	-
Insulation			
Dielectric strength	5000 V_{rms}	5000 V_{rms}	5000 V_{rms}
Clearance / creepage	10 / 10 mm	10 / 10 mm	10 / 10 mm
General data			
Ambient temperature max.	+85 °C	+85 °C	+105 °C
Standard versions	flux proof, wash tight	flux proof	flux proof
Terminals	PCB	PCB	PCB
Dimensions l x w x h	29 x 12.7 x 15.7 mm	29 x 12.7 x 15.7 mm	29 x 12.7 x 15.7 mm

PCB Power Relays

Power PCB Relay RTH 105°C 16 A

1 pole 16 A
high-temperature version

- 1 C/O or 1 N/O
- 16 A rated current
- 5 kV / 10 mm coil-contact
- Protection class II VDA /0700)
- Ambient temperature 105 °C at rated load
- Height 15.7 mm

1 C/O or 1 N/O
16 A
250 Vac
4000 VA
5...60 Vdc
400 mW
-
5000 V_{rms}
10 / 10 mm
+105 °C
flux proof
PCB
29 x 12.7 x 15.7 mm

VDE cULus

Power PCB Relay RP II/1

1 pole 8 / 12 / 16 A

- 1 C/O or 1 N/O
- 4 kV / 8 mm coil-contact
- Pinning 3.5 or 5 mm (8 / 12 A) and 5 mm (16 A)
- PCB-sockets

1 C/O or 1 N/O		
8 A	12A	16A
250 Vac		
2000 VA	3000 VA	4000 VA
5...110 Vdc		
500 mW		
-		
4000 V_{rms}		
8 / 8 mm		
+70 °C		
flux proof, wash tight		
PCB		
29 x 12.6 x 25.5 mm		

8 A VDE cULus
12 A VDE cULus NL
16 A VDE cULus

Special Load PCB Relay RP 3 SL

1 pole 16 A, for high inrush currents, mono- or bistable

- 1 N/O
- 120 A / 20 ms inrush peak current
- DC- or bistable version
- 4 kV / 8 mm coil-contact

1 N/O
16 A
250 Vac
4000 VA
5...110 Vdc
500 mW
bistable
4000 V_{rms}
8 / 8 mm
+70 °C
flux proof, wash tight
PCB
29 x 12.6 x 25.5 mm

VDE cULus NL

Faston Power Relay RPH

1 pole 16 A

- 1 N/O or 1 N/C
- Insulation to VDE 0631 and VDE 0700
- Ambient temperature up to 125 °C
- Faston-terminals

1 N/O or 1 N/C
16 A
250 Vac
4000 VA
6...48 Vdc
360 mW
-
4000 V_{rms}
8 / 8 mm
+125 °C
flux proof
PCB
29 x 13.2 x 29 mm

VDE cULus BEAB

PCB Power Relays

Power PCB Relay RP I

1 pole 8 A

- 1 C/O or 1 N/O
- 4 kV coil-contact
- Vertical and horizontal version
- Version with twin contacts
- Wash tight

Power PCB Relay RT2

2 pole 8 A
DC and AC-coil

- 2 C/O or 2 N/O
- Sensitive coil 400 mW
- DC- or AC-coil
- 5 kV / 10 mm coil-contact
- Protection class II (VDE 0700)
- Height 15.7 mm

Power PCB Relay RT2 bistable

2 pole 8 A
polarized bistable version

- 2 C/O
- Bistable with 1 or 2 coils
- 5 kV / 10 mm coil-contact
- Height 15.7 mm
- Cadmium-free contacts
- Protection class II (VDE 0700)

Contacts					
Configuration	1 C/O or 1 N/O	2 C/O or 2 N/O		2 C/O	
Rated current	8 A	8 A		8 A	
Rated voltage	250 Vac	250 Vac		250 Vac	
Breaking capacity	2000 VA	2000 VA		2000 VA	
Coil					
Nominal voltage	6...60 Vdc	5...110 Vdc	24...230 Vac	5...24 Vdc	
Nominal coil power	450...500 mW	400 mW	0,75 VA	400 / 600 mW	
Other coil versions	-	-		-	
Insulation					
Dielectric strength	4000 V_{rms}	5000 V_{rms}		5000 V_{rms}	
Clearance / creepage	4 / 4 mm	10 / 10 mm		10 / 10 mm	
General data					
Ambient temperature max.	+70 °C	+70 °C		+85 °C (UL: 70 °C)	
Standard versions	wash tight	flux proof, wash tight		flux proof	
Terminals	PCB	PCB		PCB	
Dimensions l x w x h	28 x 10.4 x 25.1 mm	29 x 12.7 x 15.7 mm		29 x 12.7 x 15.7 mm	

PCB Power Relays

Power PCB Relay RP II/2

2 pole 8 A

- 2 C/O or 2 N/O
- 4 kV / 8 mm coil-contact
- Twin contacts available
- PCB-sockets

2 C/O or 2 N/O
8 A
250 Vac
2000 VA
5...110 Vdc
500 mW
-
4000 V_{rms}
8 / 8 mm
+70 °C
flux proof, wash tight
PCB
29 x 12.6 x 25.5 mm

Miniature Power PCB Relay PB

1 pole 10 A

- 1 C/O or 1 N/O contact
- Environmentally-friendly cadmium-free contacts
- Creepage / clearence to VDE 0435 and VDE 0700
- Class F coil available

1 C/O or 1 N/O
10 A
250 Vac
2500 VA
5, 6, 12, 24 Vdc
360 mW
-
2500 V_{rms}
3 / 4 mm
+85 °C
flux proof
PCB
15 x 15 x 20 mm

Miniatur Power PCB Relay ZN

1 pole 10 A

- 1 C/O or 1 N/O
- Coil version 360 mW or 450 mW
- Ambient temperature up to 85 °C
- Creepage- / clearance to VDE 0435 and VDE 0700
- Sensitive 360 mW coil available

1 C/O or 1 N/O
10 A
250 Vac
2500 VA
6...48 Vdc
360 mW
-
2000 V_{rms}
2 / 3 mm
+85 °C
wash tight
PCB
22.5 x 16.5 x 16.9 mm

Power Relay ZD

1 pole 30 A

- 1 N/O or 1 C/O
- High breaking capacity 7500 VA
- PCB- and Faston connections and chassis mount version
- UL-class F as standard
- Ambient temperature 85 °C
- Open version available

1 C/O	1 N/O
20(N/O)/10(N/C) A	30 A
250 Vac	
4800 VA	7200 VA
6...48 Vdc	
1 W	
-	
2500 V_{rms}	
3.1 / 6.3 mm	
+85 °C	
wash tight	
PCB, Faston	
32.3 x 27.4 x 20.4 mm	

Safety Relay SR2

2 pole 6 A

- Relay with forcibly guided contacts according to EN 50205
- 1 N/O + 1 N/C or 2 C/O
- 6 kV surge resistance between poles

Safety Relay SR4

4 pole 8 A

- Relay with forcibly guided contacts according to EN 50205
- 2 N/O + 2 N/C or 3 N/O + 1 N/C
- Small size

Safety Relay SR6 D/M

4 pole 8 A

- Relay with forcibly guided contacts according to EN 50205
- 2 N/O + 2 N/C or 3 N/O + 1 N/C
- High insulation distances for safe separation of electrical circuits

Contacts			
Configuration	1 N/O + 1 N/C or 2 C/O	2N/O + 2N/C or 3N/O + 1N/C	2N/O + 2N/C, 3N/O + 1N/C
Rated current	6 A	8 A	8 A
Rated voltage	250 Vac	250 Vac	250 Vac
Breaking capacity	1500 VA	2000 VA	2000 VA
Coil			
Nominal voltage	5...110 Vdc	5...110 Vdc	5...110 Vdc
Nominal coil power	700 mW	800 mW	1200 mW
Other coil versions	-	-	-
Insulation			
Clearance / creepage coil-contact	8 / 8 mm	10 / 10 mm	5.5 / 5.5 mm
Clearance / creepage cont.-cont.	5.5 / 5.5 mm	3 / 3.5 mm	5.5 / 5.5 mm or 12 / 12 mm
General data			
Ambient temperature max.	+70 °C	+70 °C	+70 °C
Standard versions	wash tight	wash tight	wash tight
Terminals	PCB	PCB	PCB
Dimensions l x w x h	29 x 12.6 x 25.5 mm	40 x 13 x 16 mm	55 x 16.5 x 16 mm
		in preperation	

Safety Relay SR6

6 pole 8 A

- Relay with forcibly guided contacts according to EN 50205
- Small size
- 4 N/O + 2 N/C, 3 N/O + 3 N/C, 5 N/O + 1 N/C

4N/O + 2N/C, 3N/O + 3N/C, 5N/O + 1N/C
8 A
250 Vac
2000 VA
5...110 Vdc
1200 mW
-
5.5 / 5.5 mm
5.5 / 5.5 mm
+70 °C
wash tight
PCB
55 x 16.5 x 16 mm

Safety Relay SR6 sensitive

6 pole 8 A

- Relay with forcibly guided contacts according to EN 50205
- polarized with 800 mW coil power consumption
- Small size
- 4 N/O + 2 N/C, 3 N/O + 3 N/C, 5 N/O + 1 N/C

4N/O + 2N/C, 3N/O + 3N/C, 5N/O + 1N/C
8 A
250 Vac
2000 VA
5...48 Vdc
800 mW
-
5.5 / 5.5 mm
5.5 / 5.5 mm
+70 °C
wash tight
PCB
55 x 16.5 x 16 mm

in preperation

Safety Relay SR6Z

6 pole 8 A

- SR6 on printed circuit board
- 4 N/O + 2 N/C, 3 N/O + 3 N/C, 5 N/O + 1 N/C
- AC/DC input
- Spring connectors
- Module with 46 mm

4N/O + 2N/C, 3N/O + 3N/C, 5N/O + 1N/C
8 A
250 Vac
2000 VA
12...115 Vdc/Vac, 230 Vac
1200 mW
-
5.5 / 5.5 mm
3 / 3 mm
+50 °C
-
spring connector terminals
87 x 46 mm

Miniature Relay PT

2 / 3 / 4 pole 12 / 10 / 6 A,
DC- or AC-coil

- 2, 3 or 4 C/O
- Switching performance up to 3000 VA
- Low height 29 mm
- Cadmium-free contacts
- Mechanical and electrical indicator
- Manual test tab, optionally lockable

Multimode Relay MT

2 / 3 pole 10 A,
DC- or AC-coil

- 2 C/O or 3 C/O
- Cadmium-free contacts
- Mechanical indicator as standard and electrical indicator
- New front operated test system

Power Relay RM 2/3/7

2 / 3 pole 10 / 16 A,
DC- or AC-coil

- 2 C/O or 3 C/O
- Switching capacity up to 6000 VA
- Mechanical indicator
- Push-to-test-button
- Plug-in version, PCB terminals, chassis- or DIN-rail mount

Contacts								
Configuration	2 C/O	3 C/O	4 C/O	2 C/O or 3 C/O		2 C/O	3 C/O	3 C/O
Rated current	12 A	10 A	6 A	10 A		16 A	10 A	16 A
Rated voltage	250 Vac			250 Vac		380 Vac		
Breaking capacity	3000 VA	2500 VA	1500 VA	2500 VA		6000 VA	3800 VA	6000 VA
Coil								
Nominal voltage	6...220 Vdc		6...230 Vac	6...220 Vdc	6...230 Vac	6...220 Vdc		6...400 Vac
Nominal coil power	0.75 W		1.0 VA	1.2 W	2.3 VA	1.2...1.6 W		2.3...2.8 VA
Other coil versions	-			-		-		
Insulation								
Dielectric strength	2500 V_{rms}			2500 V_{rms}		2500 V_{rms}		
Clearance / creepage	3/4 mm	2.6/4 mm	1.8/3 mm	2.8 / 4 mm		3.5 / 6 mm		
General data								
Ambient temperature max.	+70 °C			DC: +60 °C	AC: +50 °C	DC: +60/70 °C		AC: +50/55 °C
Standard versions	dust-proof, flux proof			dust-proof		dust-proof		
Terminals	plug-in, PCB			plug-in		plug-in, PCB		
Dimensions l x w x h	28 x 22.5 x 29 mm			35.5 x 35.5 x 57 mm		38.5 x 35.5 x 48.5 mm		

Power Relay RM 5/6

2 / 3 pole 10 / 16 A, DC- or AC-coil

- 2 N/O or 3 N/O
- 3 mm contact gap
- Push-to-test-button
- Plug-in version, PCB terminals, chassis- or DIN-rail mount

2 N/O	3 N/O
16 A	10 A
280 Vac	
6000 VA	3800 VA
6...220 Vdc	6...400 Vac
1.6 W	2.8 VA
-	
2500 V_{rms}	
3.5 / 6 mm	
DC: +60 °C	AC: +50 °C
dust-proof	
plug-in, PCB	
38.5 x 35.5 x 48.5 mm	

Power Relay RM 8

2 pole 25 A, DC- or AC-coil

- 2 C/O
- Mechanical indicator
- Push-to-test-button
- Chassis- or DIN-rail mount

2 C/O	
25 A	
250 Vac	
6000 VA	
6...220 Vdc	6...400 Vac
1.2 W	2.8 VA
-	
2500 V_{rms}	
2.8 / 4 mm	
DC: +65 °C	AC: +40 °C
dust-proof	
Faston	
38.5 x 35.5 x 48.5 mm	

Power Relay RMC/RMD

1 pole 30 A, DC- or AC-coil

- 1 N/O or 1 N/O + 1 N/C
- Switching capacity up to 7200 VA
- Push-to-test-button
- Chassis mount

1 N/O + 1 N/C	1 N/O
30 A	
250 Vac	
7500 VA	
6...220 Vdc	6...400 Vac
1.2 W	2.8 VA
-	
2500 V_{rms}	
2.8 / 4 mm	
DC: +60 °C	AC: +40 °C
dust-proof	
Faston	
38.5 x 35.5 x 48.5 mm	

Miniature PCB Relay PE

1 pole 5 A

F0169-B

Features

- 1 C/O contact
- Cadmium-free contacts
- Sensitive coil 200 mW
- 4 kV coil-contact
- Insulation according to IEC 255
- Ambient temperature 85 °C
- Low height 10.0 mm

Applications

Industrial electronics, white goods, measurement and control

Technical data of approved types on request

Contact data

Configuration	1 C/O contact
Type of contact	single contact
Rated current	5 A
Rated voltage / max.breaking voltage AC	250 Vac / 440 Vac
Maximum breaking capacity AC	1250 VA
Contact material	AgNi 90/10

Contact ratings

Type	Load	Operations	Standard
PE 014	5A, 250 Vac, on the C/O contact	10^5	VDE 0435
PE 014	20/2A, 250Vac, cosφ=0.3, on the N/O contact	$1.2x10^5$	AC 15
PE 014	5 A, 250 Vac, on the C/O contact	$1.5x10^5$	

Coil data

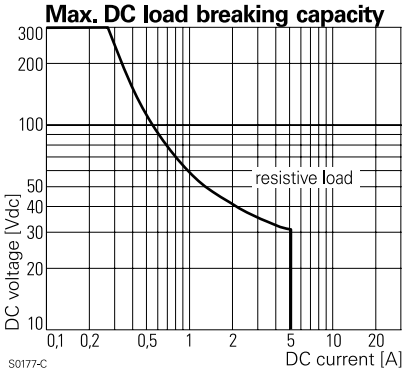
Nominal voltage	5...48 Vdc
Nominal coil power	typ. 200 mW
Operate category	2 / b

Coil versions, DC-coil

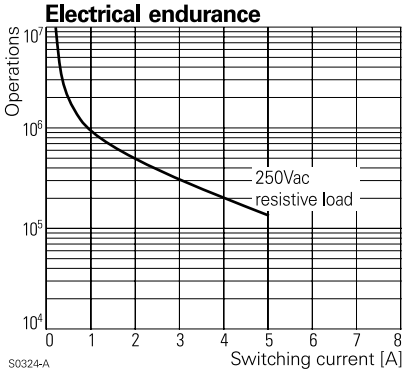
Coil code	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Maximum voltage Vdc	Coil resistance Ω	Coil current mA
005	5	3.8	0.5	13.2	125±10%	40.0
006	6	4.5	0.6	15.9	172±10%	34.9
012	12	9.0	1.2	31.8	685±10%	17.5
024	24	18.0	2.4	63.6	2725±10%	8.8
048	48	36.0	4.8	127.2	10970±10%	4.4

All figures are given for coil without preenergization, at ambient temperature +20 °C
Other coil voltages on request

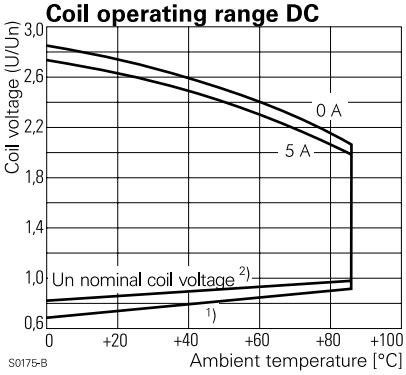
Max. DC load breaking capacity



Electrical endurance



Coil operating range DC



Miniature PCB Relay PE

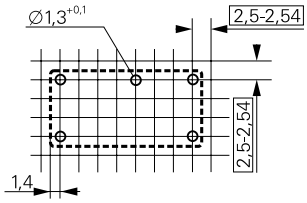
1 pole 5 A

Insulation		
Dielectric strength	coil-contacts	4000 V_{rms}
	open contact circuit	1000 V_{rms}
Clearance / creepage		≥3.2 / 4 mm
Insulation to IEC 60664		
Voltage rating		250 V
Pollution degree		3
Overvoltage category		III
Tracking resistance of relay base		CTI 250

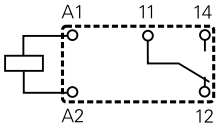
Other data	
Flammability class according to UL 94	V-0
Ambient temperature	-40...+85 °C
Mechanical life	15x10^6 operations
Max. switching rate at rated- / minimum load	6 min^{-1} / 1200 min^{-1}
Operate- / release time	typ. 5 / 2 ms
Bounce time N/O contact/N/C contact	typ. 1 / 5 ms
Vibration resistance N/O contact/N/C contact	>15 / 5 g
Shock resistance (destruction)	>100 g
Category of protection (IEC 61810)	RT II - flux proof, RT III - wash tight
Relay weight	5 g
Packaging unit	25 / 500 pcs.

PCB layout / terminal assigment

View on solder pins
Dimensions in mm



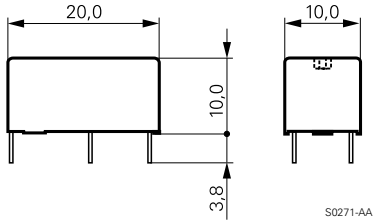
S0176-BA



S0176-BB

Dimensions

Dimensions in mm



S0271-AA

Product key

P	E	0	1	4			

Type

Version
0 flux proof *) **5** wash tight

Contacts
1 1 C/O contact

Contact material
4 AgNi 90/10

Coil
Coil code: please refer to coil versions table

Miniature PCB Relay PE bistable

1pole 5 A, polarized bistable version

F0221-A

Features

- 1 C/O contact
- Cadmium-free contacts
- 4 kV coil-contact
- Insulation according to IEC 255
- Ambient temperature 70 °C
- Low height 10.0 mm

Applications

Room thermostats, electricity meters, domotic devices and white goods

VDE c UL us

Technical data of approved types on request

Contact data

Configuration	1 C/O contact
Type of contact	single contact
Rated current	5 A
Rated voltage / max.breaking voltage AC	250 Vac / 440 Vac
Maximum breaking capacity AC	1250 VA
Contact material	AgNi 90/10

Contact ratings

Type	Load	Operations	Standard
PE 014	5A, 250 Vac, on the C/O contact	10^5	VDE 0435

Coil data

Nominal voltage	3...48 Vdc
Nominal coil power	typ. 360 mW
Minimum energization time	20 ms
Information on reduced pulse duration with higher energization voltages on demand	
Max. energization time	1 min at <10%duty cycle
Reset voltage max.	120 % U_{nom} at -40 °C

Coil versions, bistable, 1 coil, 360 mW

Coil code*		Nominal voltage Vdc	Pull-in voltage Vdc	Reset voltage Vdc	Coil resistance Ω	Coil current mA
A03	C03	3	2.25	2.25	25±10%	120.0
A05	C05	5	3.75	3.75	69±10%	72.0
A06	C06	6	4.5	4.5	100±10%	60.0
A12	C12	12	9.0	9.0	400±10%	30.0
A24	C24	24	18.0	18.0	1600±10%	15.0

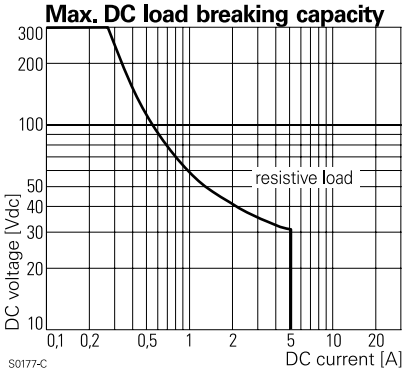
All figures are given for coil without preenergization, at ambient temperature +20 °C
* Coil codes A.. and C.. have opposite polarity; refer to coil operation table
Other coil voltages on request

Coil versions, bistable, 1 coil, 200 mW

Coil code*		Nominal voltage Vdc	Pull-in voltage Vdc	Reset voltage Vdc	Coil resistance Ω	Coil current mA
F02	H02	2.2	1.65	1.65	22±10%	100.0
F03	H03	3	2.25	2.25	41±10%	73.3
F05	H05	5	3.75	3.75	125±10%	40.0
F06	H16	6	4.5	4.5	180±10%	33.3
F12	H12	12	9.0	9.0	650±10%	18.3
F 24	H24	24	18.0	18.0	2780±10%	8.8

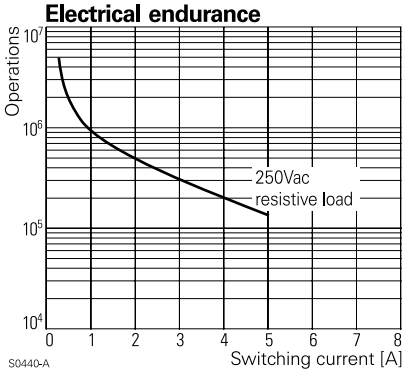
All figures are given for coil without preenergization, at ambient temperature +20 °C
* Coil codes A.. and C.. have opposite polarity; refer to coil operation table
Other coil voltages on request

Max. DC load breaking capacity



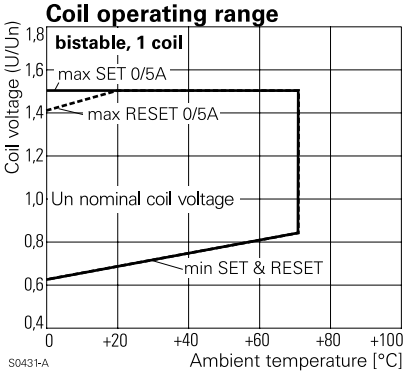
S0177-C

Electrical endurance



S0440-A

Coil operating range



S0431-A

Miniature PCB Relay PE bistable

1pole 5 A, polarized bistable version

Coils - operation

version	A..		C..	
coil terminals	A1	A2	A1	A2
pull-in	+	−	−	+
reset	−	+	+	−

Contact position not defined at delivery

Insulation

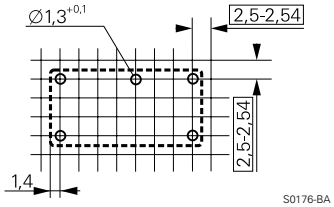
Dielectric strength	coil-contacts	4000 V_{rms}
	open contact circuit	1000 V_{rms}
Clearance / creepage		≥3.2 / 4 mm
Insulation to IEC 60664		
Voltage rating		250 V
Pollution degree		3
Overvoltage category		III
Tracking resistance of relay base		CTI 250

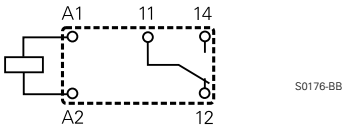
Other data

Flammability class according to UL 94	V-0
Ambient temperature	-40...+70 °C
Mechanical life	$5x10^6$ operations
Max. switching rate at rated- / minimum load	6 min^{-1} / 1200 min^{-1}
Shock resistance (destruction)	>100 g
Category of protection (IEC 61810)	RT II - flux proof, RT III - wash tight
Relay weight	5 g
Packaging unit	25 / 500 pcs.

PCB layout / terminal assigment

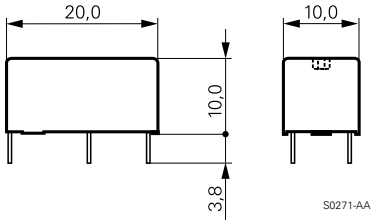
View on solder pins
Dimensions in mm





Dimensions

Dimensions in mm



Product key

P	E	0	1	4			

Type

Version
0 flux proof *) **5** wash tight

Contacts
1 1 C/O contact

Contact material
4 AgNi 90/10

Coil
Coil code: please refer to coil versions table

Miniature PCB Relay RE

1 pole 6 A

F0141-A

Features

- 1N/O contact
- Sensitive coil 200 mW
- 4 kV coil-contact
- Optimized height 10,6 mm
- PCB area 200 mm²
- Wash tight

Applications

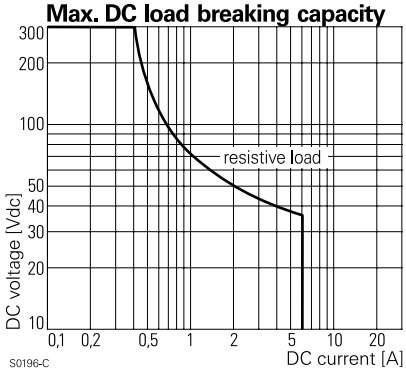
PLC's, timers, temperature control, I / O cards

Technical data of approved types on request

Contact data

Configuration	1 N/O contact
Type of contact	single contact
Rated current	6 A
Rated voltage / max.breaking voltage AC	250 Vac / 440 Vac
Maximum breaking capacity AC	1500 VA
Make current (max. 4 s at duty cycle 10%)	15 A
Contact material	AgCdO, Ag gold plated

Max. DC load breaking capacity

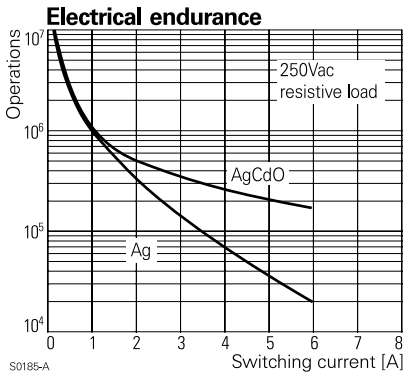


S0196-C

Contact ratings

Type	Load	Operations	Standard
RE 030	2 A, 400 Vac, AC 11	$2x10^5$	VDE 0660
RE 030	2 A, 250 Vac, AC 11	$4x10^5$	VDE 0660
RE 030	0.33 A, 250 Vac, AC 11	$5x10^6$	VDE 0660
RE 030	1/8hp, 120 Vac	$3x10^4$	UL 508
RE 030	1/4hp, 240 Vac	$3x10^4$	UL 508
RE 030	B 300		UL 508
RE 030	6 A, 30 Vdc, resistive	$5x10^5$	
RE 030	0.3 A, 50 Vdc, L/R=40 ms	$3x10^6$	
RE 030	6 (3) A, 250 Vac	$1x10^5$	VDE 0631

Electrical endurance



S0185-A

Coil data

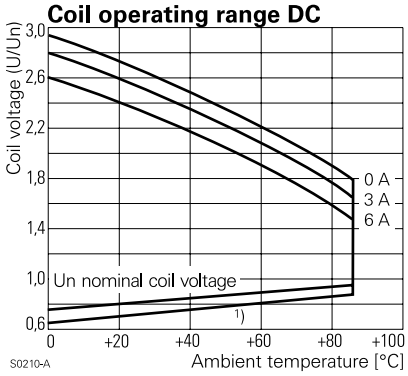
Nominal voltage	5...48 Vdc
Nominal coil power	200 mW
Operate category	2 / b

Coil versions, DC-coil

Coil code	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Maximum voltage Vdc	Coil resistance Ω	Coil current mA
005	5	3.5	0.5	13.5	125±10%	40.0
006	6	4.2	0.6	16.2	180±10%	33.3
012	12	8.4	1.2	32.4	720±10%	16.7
024	24	16.8	2.4	64.8	2880±15%	8.3
048	48	33.6	4.8	129.6	11520±15%	4.2

All figures are given for coil without preenergization, at ambient temperature +20 °C, single mounting
Other coil voltages on request

Coil operating range DC



S0210-A

Miniature PCB Relay RE

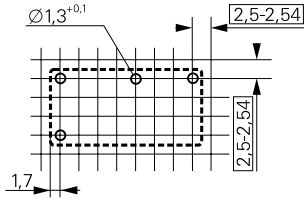
1 pole 6 A

Insulation		
Dielectric strength	coil-contacts	4000 V_{rms}
	open contact circuit	1000 V_{rms}
Clearance / creepage		≥ 4 / 4 mm
Insulation to IEC 60664		
Voltage rating		250 V
Pollution degree		3
Overvoltage category		III
Insulation to VDE 0110b (2/79)		
Insulation category / reference voltage		C / 250, B / 400

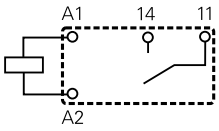
Other data		
Flammability class according to UL 94		V-0
Ambient temperature		-40...+70 °C, -40...+85 °C at 4 A
Mechanical life		> 30x10^6 operations
Max. switching rate at rated- / minimum load		6 min^{-1} / 1200 min^{-1}
Operate- / release time		typ. 5 / 1 ms
Bounce time		typ. 1 ms
Vibration resistance	open contact:	10 g
	closed contact:	20 g
Shock resistance (destruction)		100 g
Category of protection (IEC 61810)		RT III - wash tight
Relay weight		5 g
Packaging unit		25 / 500 pcs.

PCB layout / terminal assigment

View on solder pins
Dimensions in mm



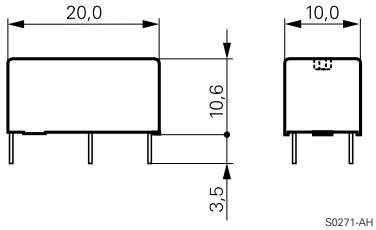
S0176-BH



S0176-BJ

Dimensions

Dimensions in mm



S0271-AH

Product key

R	E	0	3				

Type

Version
0 wash tight

Contacs
3 1 N/O contact

Contact material
0 AgCdO
2 Ag gold plated

Coil
Coil code: please refer to coil versions table

Slim PCB Relay SNR

1 pole 6 A

F0140-C

Features

- 1 C/O or 1 N/O contact
- Only 5 mm wide with 6 A switching current
- Sensitive coil 170 mW
- 4 kV coil-contact, 6 / 8 mm clearance/creepage
- N/O version with 8 / 8 mm clearance/creepage on request
- Protection class II
- Allows high function-/packing density
- Cadmium-free contacts, AgNi 90/10 for AC-loads

Applications

Centralized and decentralized heating control, extremely narrow interface elements, interface technology, timers, PLC's, I/O modules, I/O-ports

Technical data of approved types on request

Contact data

Configuration	1 C/O contact or 1 N/O contact	
Type of contact	single contact	
Rated current	6 A	
Rated voltage / max.breaking voltage AC	250 Vac / 440 Vac	
Maximum breaking capacity AC	1500 VA	
Contact material	AgSnO	AgSnO gold plated
Minimum contact load	≥100 mA 12 V	≥10 mA 5 V

Contact ratings

Type	Load	Operations
SNR1,6	5 A, 250 Vac, resistive	$1x10^5$
SNR1,6	2 A, 250 Vac, cosφ0.4	$2x10^5$
SNR1,6	1 A, 24 Vdc, L / R=48 ms	$2x10^5$

Coil data

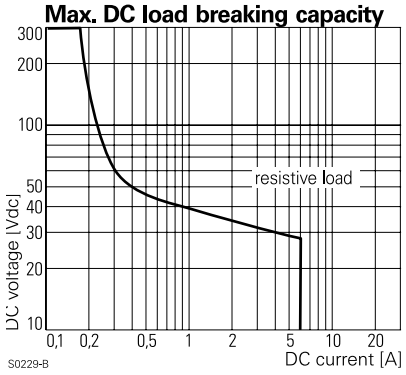
Nominal voltage	5...48 Vdc
Nominal coil power	170 mW
Operate power	75 mW...95 mW
Operate category	2 / b

Coil versions

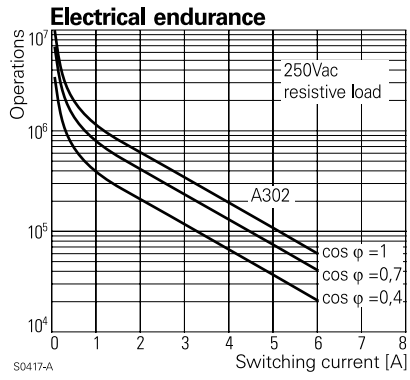
Coil code	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Maximum voltage Vdc	Coil resistance Ω	Coil current mA
005	5	3.5	0.25	11.2	147±10%	34.0
012	12	8.4	0.6	26.8	848±10%	14.2
024	24	16.8	1.2	53.7	3390±10%	7.1
048	48	33.6	2.4	100.0	10600±15%	4.5

All figures are given for coil without preenergization, at ambient temperature +20°C
Other coil voltages on request

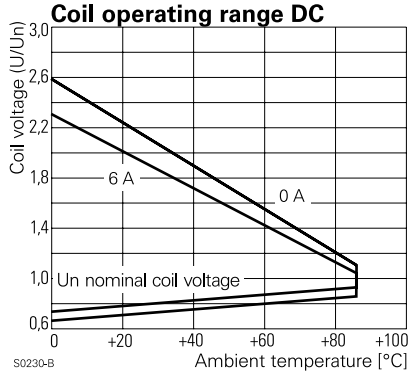
Max. DC load breaking capacity



Electrical endurance



Coil operating range DC



Slim PCB Relay SNR

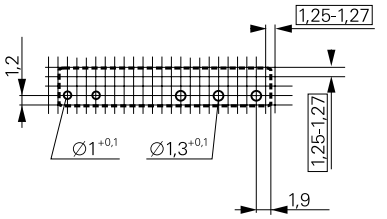
1 pole 6 A

Insulation		
Dielectric strength	coil-contacts	4000 V_{rms}
	open contact circuit	1000 V_{rms}
Surge voltage resistance coil-contacts		6000 V (1.2 / 50 µs)
Clearance / creepage (standard)		6 / 8 mm
Insulation to IEC 664/VDE 0110 (04 / 97)		
Voltage rating		250 V
Pollution degree		3
Overvoltage category		III
Insulation to VDE 0110b (2/79)		
Insulation category / reference voltage		C / 250
Tracking resistance of relay base		CTI 250

Other data	
Flammability class according to UL 94	V-0
Ambient temperature	-40...+85 °C
Mechanical life	$10x10^6$ operations
Max. switching rate at rated- / minimum load	6 min^{-1} / 20 s^{-1}
Operate- / release time	5 / 2.5 ms
Bounce time N/O contact/N/C contact	1.5 / 5 ms
Category of protection (IEC 61810)	RT III - wash tight
Relay weight	6 g
Packaging unit	20 / 1000 pcs.
Accessories	see accessories SNR

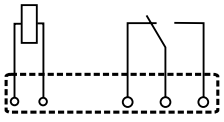
PCB layout / terminal assigment

View on solder pins
Dimensions in mm



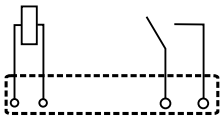
S0258-AA

1 C/O contact



S0258-AB

1 N/O contact

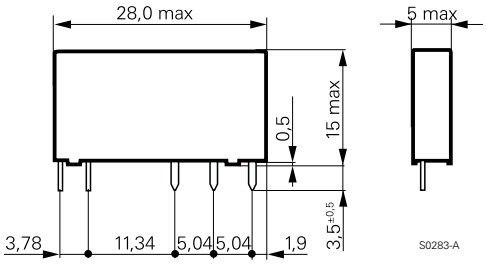


S0258-AC

Dimensions

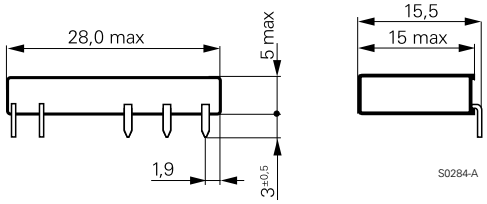
Dimensions in mm

Vertical version



S0283-A

Flat pack version



S0284-A

Product key

S	N	R					

Type
Slim PCB Relay, wash tight

Version
0 PCB vertical version, 1 C/O contact
1 PCB vertical version, 1 N/O contact
5 PCB flat pack version, 1 C/O contact
6 PCB flat pack version, 1 N/O contact

Contact material
3 AgSnO
7 AgSnO, gold plated
8 AgNi 90/10

Coil
Coil code: please refer to coil versions table

Miniature Power PCB Relay RY II

1 pole 8 A

F0142-C

Features

- Low component height 12.3 mm
- 1 C/O or 1 N/O or 1 N/C contact
- 5 kV / 8 mm coil-contact
- Protection class II (VDE 0700)
- Pinnings: 3.2 and 5 mm
- Sockets with PCB-type or screw-type terminals
- Especially suitable for resistive and inductive loads on N/O and N/C contacts

Appplications

Heating control, interface technology, domestic appliances, timers, temperature control

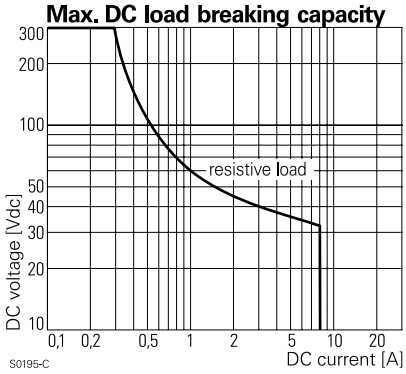
VDE c UL us

Technical data of approved types on request

Contact data

Configuration	1 C/O contact, 1 N/O contact, 1 N/C contact
Type of contact	single contact
Rated current	8 A
Rated voltage / max.breaking voltage AC	250 Vac / 440 Vac
Maximum breaking capacity AC	2000 VA
Make current (max. 4 s at duty cycle 10%)	30 A
Contact material	AgCdO, Ag, AgSnO

Max. DC load breaking capacity

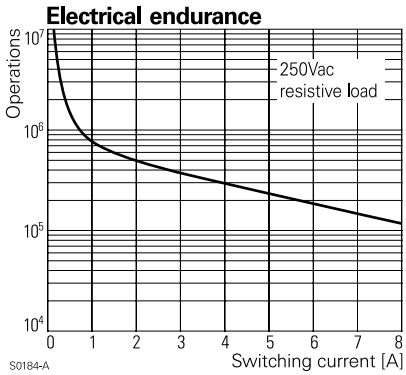


S0195-C

Contact ratings

Type	Load	Operations	Standard
RY610	B 300, 120 Vac, 70 °C		UL 508
RY610	B 300, 240 Vac, 70 °C		UL 508
RY610	1 / 4 hp, 120 Vac, 70 °C		UL 508
RY610	1 / 2 hp, 240 Vac, 70 °C		UL 508
RY610	8 A, 28 Vdc, 70 °C	$>3x10^4$	UL 508
RY610	0.28 A, 250 Vdc, 70 °C	$>3x10^4$	UL 508
RY531	6 (4) A, 250 Vac, 85 °C	$1x10^5$	VDE 0631

Electrical endurance



S0184-A

Coil data

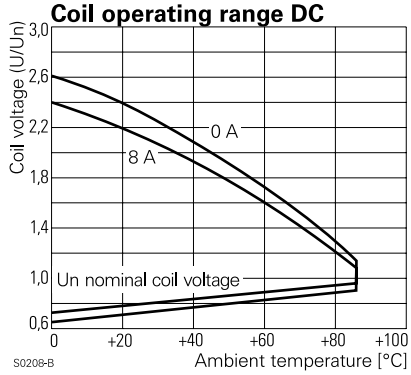
Nominal voltage	5...48 Vdc
Nominal coil power	approx. 220 mW
Operate category	2 / b

Coil versions

Coil code	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Maximum voltage Vdc	Coil resistance Ω	Coil current mA
005	5	3.5	0.5	11.8	113±10%	44.0
006	6	4.2	0.6	14.1	164±10%	36.7
012	12	8.4	1.2	28.2	620±10%	19.3
024	24	16.8	2.4	56.4	2350±10%	10.2
048	48	33.6	4.8	112.8	9600±10%	5.0

All figures are given for coil without preenergization, at ambient temperature +20 °C
Other coil voltages on request

Coil operating range DC



S0208-B

Miniature Power PCB Relay RY II

1 pole 8 A

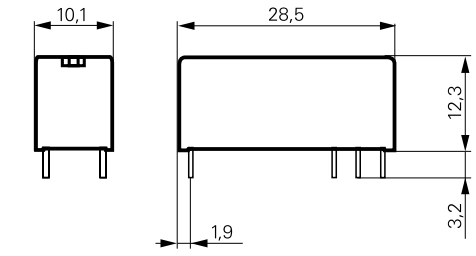
Insulation		
Dielectric strength	coil-contacts	5000 V_{rms}
	open contact circuit	1000 V_{rms}
Clearance / creepage		8 / 8 mm
Insulation to IEC 60664		
Voltage rating		250 V
Pollution degree		3
Overvoltage category		III
Insulation to VDE 0110b (2/79)		
Insulation category / reference voltage		C / 250
Tracking resistance of relay base		CTI 250

Other data	
Ambient temperature	-40...+85 °C
Mechanical life	30x10^6 operations
Max. switching rate at rated- / minimum load	6 min^{-1} / 20 s^{-1}
Operate- / release time	7 / 3 ms
Bounce time N/O contact	1 ms
Vibration resistance N/O / N/C contact	20 / 5 g, 10...500 Hz
Shock resistance (destruction)	100 g
Category of protection (IEC 61810)	RT II - flux proof, RT III - wash tight
Relay weight	8 g
Packaging unit	20 / 500 pcs.
Accessories	see accessories RY

Dimensions

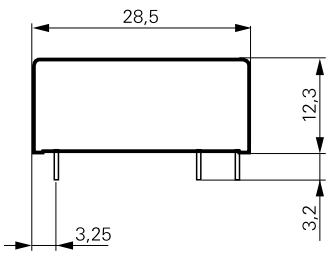
Dimensions in mm

Pinning 3.2 mm



S0274-AA

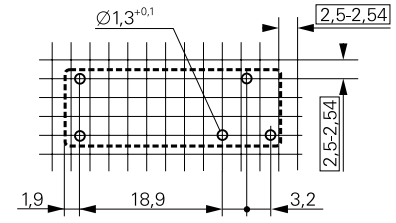
Pinning 5 mm



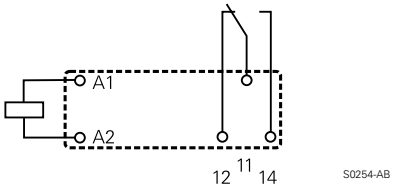
S0274-AB

PCB layout / terminal assigment

1 C/O contact, 3.2 mm

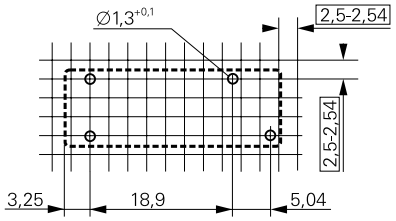


S0254-AA

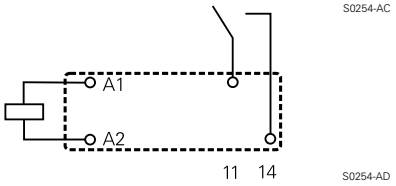


S0254-AB

1 N/O contact, 5 mm



S0254-AC



S0254-AD

View on solder pins

Dimensions in mm

Product key

R Y

Type

Version

2	pinning 3.2 mm, flux proof	**6**	pinning 3.2 mm, wash tight
5	pinning 5 mm, flux proof	**A**	pinning 5 mm, wash tight

Contacts

1	1 C/O contact, pinning 3.2 mm	**3**	1 N/O contact, pinning 5 mm

Contact material

0	AgCdO	**2**	AgNi0.15 gold plated
1	Ag	**3**	AgSnO

Coil

Coil code: please refer to coil versions table

Other types on request

Power PCB Relay RT1

1 pole 12 / 16 A, DC- or AC-coil

F0144-B

Features

- 1 C/O or 1 N/O contact
- Sensitive coil 400 mW / 0,75 VA
- 5 kV / 10 mm coil-contact, Protection class II (VDE 0700)
- Ambient temperature 85°C (DC-coil)
- Height 15.7 mm
- Sockets with PCB-type or screw-type terminals
- Gold plated contacts available

Applications

Boiler control, timers, garage door control, POS automation, interface modules

Technical data of approved types on request

Contact data

Configuration	1 C/O contact or 1 N/O contact	
Type of contact	single contact	
Rated current	12 A	16 A
Rated voltage / max.breaking voltage AC	250 Vac / 440 Vac	
Maximum breaking capacity AC	3000 VA	4000 VA
Make current (max. 4 s at duty cycle 10%)	25 A	30 A
Contact material	AgNi 90/10, AgNi 90/10 gold plated	

Contact ratings

Type	Load	Operations
RT314	1000 W, 250 Vac, incandescent lamps	$1.2x10^3$
RT314	16 A, 250 Vac, cosφ=1, N/C contact	$53x10^3$
RT314	10 A, 250 Vac, cosφ=0.6, C/O contact	$2x10^5$
RT314	5 A / 2 A, 250 Vac, cosφ=1, tumble-drier motor, N/O contact	$1.1x10^6$
RT314	$0.26A_{peak}$ / 0.01 A, 230 Vac, cosφ=0.38, valve, N/O contact	$7.6x10^6$

Coil data

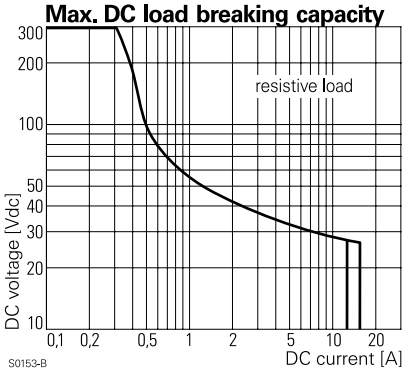
Nominal voltage	DC coil	5...110 Vdc
	AC coil	24...230 Vac
Nominal coil power	DC coil	400 mW
	AC coil	0.75 VA
Operate category		2 / b

Coil versions, DC-coil

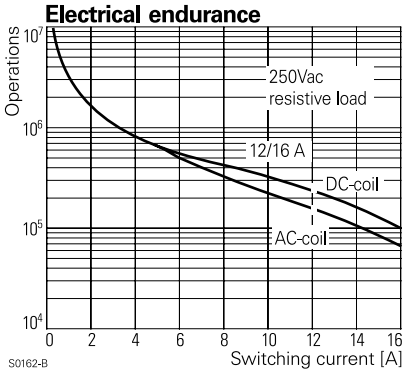
Coil code	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Maximum voltage Vdc	Coil resistance Ω	Coil current mA
005	5	3.5	0.5	12.7	62±10%	80.0
006	6	4.2	0.6	15.3	90±10%	66.7
012	12	8.4	1.2	30.6	360±10%	33.3
024	24	16.8	2.4	61.2	1440±10%	16.7
048	48	33.6	4.8	122.4	5520±10%	8.7
060	60	42.0	6.0	153.0	7340±12%	8.1
110	110	77.0	11.0	280.5	26600±12%	4.1

All figures are given for coil without preenergization, at ambient temperature +20 °C
Other coil voltages on request

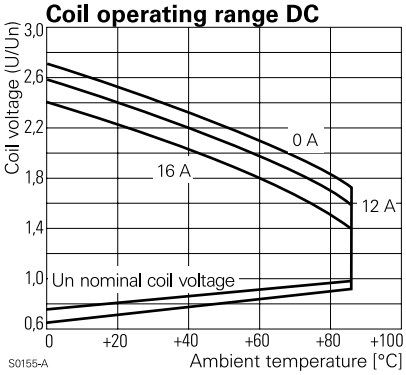
Max. DC load breaking capacity



Electrical endurance



Coil operating range DC



Power PCB Relay RT1

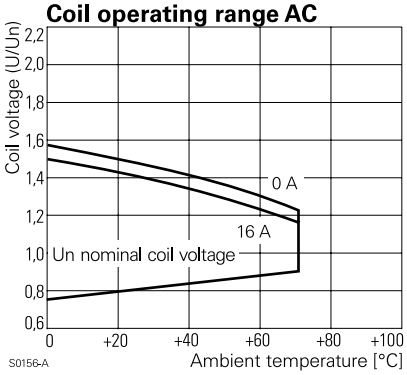
1 pole 12 / 16 A, DC- or AC-coil

Coil versions, AC-coil

Coil code	Nominal voltage Vac	Pull-in voltage Vac	Release voltage Vac	Maximum voltage Vac	Coil resistance Ω	Coil current mA
524	24	18.0	3.6	36.0	350±10%	31.6
615	115	86.3	17.3	172.5	8100±15%	6.6
730	230	172.5	34.5	345.0	32500±15%	3.2

All figures are given for coil without preenergization, at ambient temperature +20°C

Coil operating range AC



Insulation

Dielectric strength	coil-contacts	5000 V_{rms}
	open contact circuit	1000 V_{rms}
Clearance / creepage		10 / 10 mm
Insulation to IEC 60664		
Voltage rating		250 V
Pollution degree		3
Overvoltage category		III
Insulation to VDE 0110b (2/79)		
Insulation category / reference voltage		C / 250
Tracking resistance of relay base		CTI 250

Other data

Flammability class according to UL 94		V-0
Coil insulation system according to UL 1446		Class F
Ambient temperature	DC-coil	-40...+85 °C
	AC-coil	-40...+70 °C
Mechanical life	DC-coil	>30x10⁶ operations
	AC-coil	>10x10⁶ operations
Max. switching rate at rated- / minimum load		6 min^{-1} / 1200 min^{-1}
Operate- / release time DC-coil		typ. 7 / 3 ms
Bounce time N/O contact/N/C contact		typ. 1 / 3 ms
Vibration resistance N/O / N/C contact		20 / 5 g, 30...500 Hz
Shock resistance (destruction)		100 g
Category of protection (IEC 61810)		RT II - flux proof, RT III - wash tight
Relay weight		14 g
Packaging unit		20 / 500 pcs.
Accessories		see accessories RT

Power PCB Relay RT1

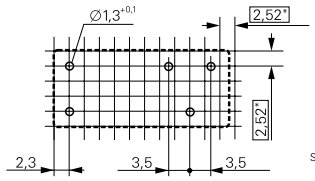
1 pole 12 / 16 A, DC- or AC-coil

PCB layout / terminal assigment

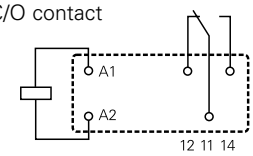
View on solder pins
Dimensions in mm

*) With the recommended PCB hole sizes a grid pattern from 2.5 mm to 2.54 mm can be used.

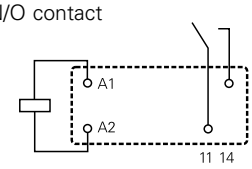
12 A, pinning 3.5 mm



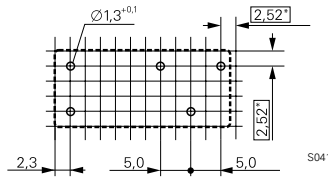
1 C/O contact



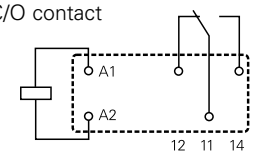
1 N/O contact



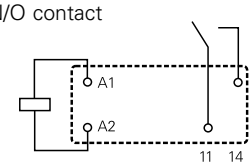
12 A, pinning 5 mm



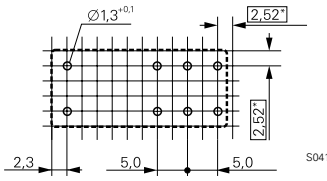
1 C/O contact



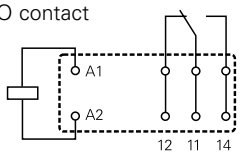
1 N/O contact



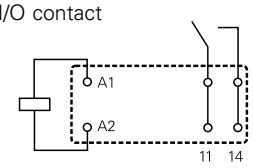
16 A, pinning 5 mm



1 C/O contact

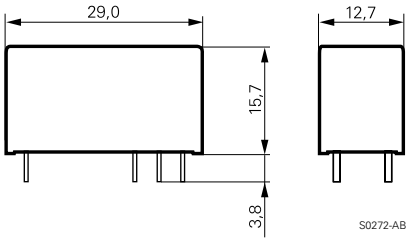


1 N/O contact



Dimensions

Dimensions in mm



Product key

R T

Type

Version

1	**12 A, pinning 3.5 mm, flux proof**	**B**	12 A, pinning 3.5 mm, wash tight
2	12 A, pinning 5 mm, flux proof *)	**C**	12 A, pinning 5 mm, wash tight
3	**16 A, pinning 5 mm, flux proof**	**D**	16 A, pinning 5 mm, wash tight

Contacts

1	1 C/O contact	**3**	1 N/O contact

Contact material

4	AgNi 90/10	**5**	AgNi 90/10 gold plated (for type RT31.)

Coil

Coil code: please refer to coil versions table

Preferred types in bold print

Power PCB Relay RT1 bistable

1 pole 16 A, polarized bistable version

F0176-B

Features

- 1 C/O contact
- Bistable with 1 or 2 coils
- 5 kV / 10 mm coil-contact
- Height 15.7 mm
- Cadmium-free contacts
- Protection class II (VDE 0700)

Applications

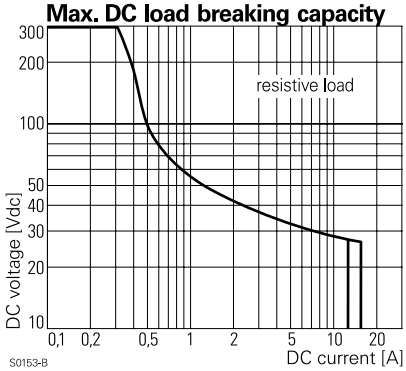
Battery powered equipment or applications with "memory function"

VDE c UL us

Technical data of approved types on request

Contact data	
Configuration	1 C/O contact
Type of contact	single contact
Rated current	16 A
Rated voltage / max.breaking voltage	250 Vac / 440 Vac
Rated breaking capacity	4000 VA
Make current (max. 4 s at duty cycle 10%)	30 A
Contact material	AgNi 90/10

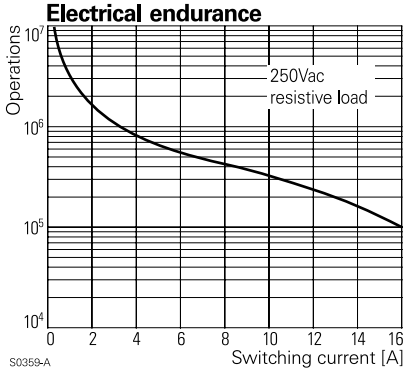
Max. DC load breaking capacity



S0153-B

Coil data	1 coil	2 coils
Nominal voltage	5...24 Vdc	
Nominal coil power	typ. 400 mW	typ. 600 mW
Minimum energization time	30 ms	
Information on reduced pulse duration with higher energization voltages on demand		
Max. energization for version with 2 coils	1 min at <10% duty cycle	
Reset voltage max.	120 % U_{nom}	150 % U_{nom}

Electrical endurance



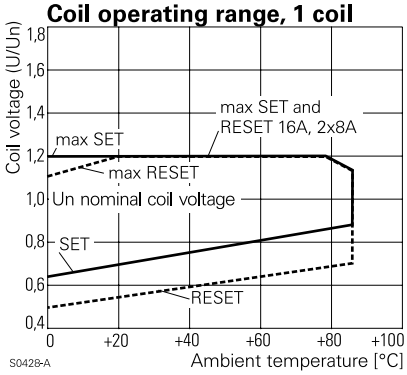
S0359-A

Coil versions, bistable

Coil code	Nominal voltage Vdc	Pull-in voltage Vdc	Reset voltage Vdc	Coil resistance Ω	Coil current mA
bistable, 1 coil					
A05	5	3.5	3.5	62±10%	80.0
A06	6	4.2	4.2	90±10%	66.7
A12	**12**	**8.4**	**8.4**	**360±10%**	**33.3**
A24	**24**	**16.8**	**16.8**	**1440±10%**	**16.7**
bistable, 2 coils					
F05	5	3.5	3.5	42±10%	120.0
F06	6	4.2	4.2	55±10%	110.0
F12	**12**	**8.4**	**8.4**	**240±10%**	**50.0**
F24	**24**	**16.8**	**16.8**	**886±10%**	**27.0**

All figures are given for coil without preenergization, at ambient temperature +20 °C
Other coil voltages on request

Coil operating range, 1 coil



S0428-A

Coils - operation					
Version	1 coil		2 coils		
Coil terminals	A1	A2	A1	A3	A2
Pull-in	+	−		+	−
Reset	−	+	−	+	
Contact position not defined at delivery					

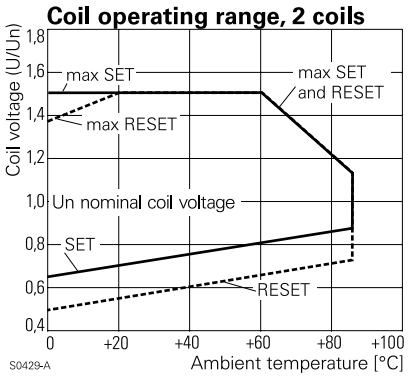
Power PCB Relay RT1 bistable

1 pole 16 A, polarized bistable version

Insulation		
Dielectric strength	coil-contacts	5000 V_{rms}
	open contact circuit	1000 V_{rms}
Clearance / creepage		10 / 10 mm
Insulation to IEC 60664		
Voltage rating		250 V
Pollution degree		3
Overvoltage category		III
Insulation to VDE 0110b (2/79)		
Insulation category / reference voltage		C / 250
Tracking resistance of relay base		CTI 250

Other data		
Flammability class according to UL 94		V-0
Coil insulation system according to UL 1446		Class F
Ambient temperature		-40...+85 °C
Mechanical life		5x10^6 operations
Max. switching rate at rated- / minimum load		6 min^{-1} / 600 min^{-1}
Operate- / release time		typ. 5 / 4 ms
Bounce time N/O contact/N/C contact		typ. 1 / 3 ms
Vibration resistance / shock resistance		
opening N/C contact		3 / 5 g
opening closed N/O contact		6 / 15 g
Shock resistance (destruction)		100 g
Category of protection (IEC 61810)		RT II - flux proof, RT III - wash tight
Relay weight		13 g
Packaging unit	1 coil	20 / 500 pcs.
	2 coils	25 / 100 pcs.
Accessories		see accessories RT

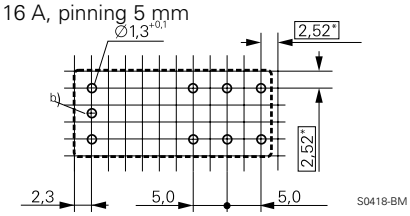
Coil operating range, 2 coils



PCB layout / terminal assigment

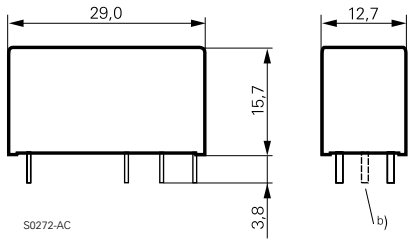
View on solder pins
Dimensions in mm

16 A, pinning 5 mm



*) With the recommended PCB hole sizes a grid pattern from 2.5 mm to 2.54 mm can be used.

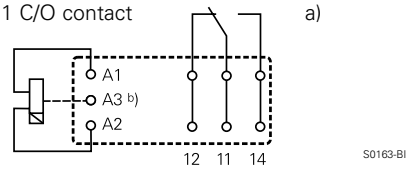
Dimensions



a) Indicated contact position during or after coil energization with reset voltage.

b) for 2 coil version only

1 C/O contact a)



Product key

R T | 3 | 1 | 4 | | | |

Type

Version
- **3** 16 A, pinning 5 mm, flux proof — **D** wash tight

Contacts
- **1** 1 C/O contact

Contact material
- **4** AgNi 90/10

Coil
- Coil code: please refer to coil versions table

Preferred types in bold print

Power PCB Relay RT1 sensitive

1 pole 10 A, highly sensitive version

F0145-B

Features

- 1 C/O or 1 N/O contact
- Sensitive coil 250 mW
- 5 kV / 10 mm coil-contact
- Protection class II (VDE 0700)
- Ambient temperature 85 °C at rated load
- Height 15.7 mm
- Sockets with PCB-type or screw-type terminals

Applications

Domestic appliances, heating control

VDE cULus

Technical data of approved types on request

Contact data

Configuration	1 C/O contact or 1 N/O contact
Type of contact	single contact
Rated current	10 A
Rated voltage / max.breaking voltage AC	250 Vac / 440 Vac
Maximum breaking capacity AC	2500 VA
Make current (max. 4 s at duty cycle 10%)	15 A
Contact material	AgNi 90/10

Contact ratings

Type	Load	Operations
RT174	8 A, 250 Vac	$4.3x10^5$
RT174	370 W, 230 Vac, compressor, N/O contact	$>3.3x10^5$
RT174	550 W, 250 Vac, incandescent lamps, N/O contact	$1.9x10^5$
RT174	$0.8A_{peak}$ / 0.08 A, 230 Vac, cosφ=0.23, contactor 190 / 90 VA, N/O contact	$>8.8x10^6$

Coil data

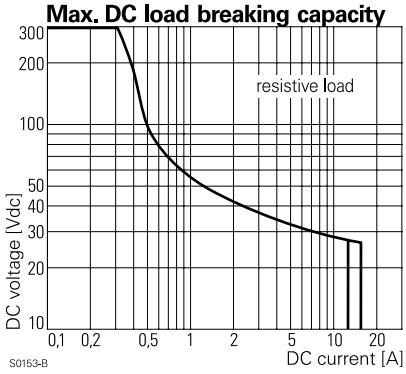
Nominal voltage	5...60 Vdc
Nominal coil power	250 mW
Operate category	2 / b

Coil versions, sensitive DC-coil

Coil code	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Maximum voltage Vdc	Coil resistance Ω	Coil current mA
005	5	3.7	0.5	15.0	100±10%	50.0
006	6	4.5	0.6	18.0	144±10%	41.7
012	**12**	**9.0**	**1.2**	**36.0**	**576±10%**	**20.8**
024	**24**	**18.0**	**2.4**	**72.0**	**2304±10%**	**10.4**
048	48	36.0	4.8	144.0	9216±10%	5.4
060	60	45.0	6.0	180.0	12857±12%	4.7

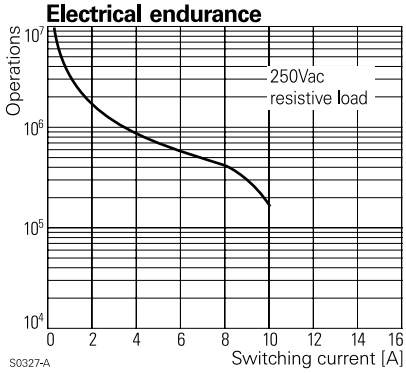
All figures are given for coil without preenergization, at ambient temperature +20 °C
Other coil voltages on request

Max. DC load breaking capacity



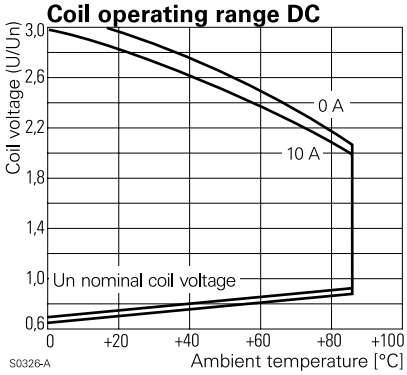
S0153-B

Electrical endurance



S0327-A

Coil operating range DC



S0326-A

Power PCB Relay RT1 sensitive

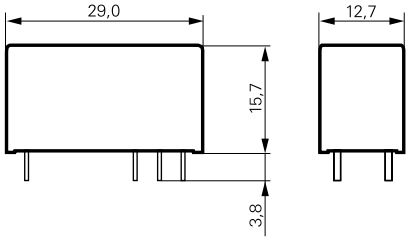
1 pole 10 A, highly sensitive version

Insulation		
Dielectric strength	coil-contacts	5000 V_{rms}
	open contact circuit	1000 V_{rms}
Clearance / creepage		10 / 10 mm
Insulation to IEC 60664		
Voltage rating		250 V
Pollution degree		3
Overvoltage category		III
Insulation to VDE 0110b (2/79)		
Insulation category / reference voltage		C / 250

Other data	
Flammability class according to UL 94	V-0
Coil insulation system according to UL 1446	Class F
Ambient temperature	-40...+85 °C
Mechanical life	30x10^6 operations
Max. switching rate at rated- / minimum load	50 min^{-1} / 1200 min^{-1}
Operate- / release time	typ. 7 / 3 ms
Bounce time N/O contact/N/C contact	typ. 2 / 4 ms
Vibration resistance	5 g, 30...150 Hz
Shock resistance (destruction)	100 g
Category of protection (IEC 61810)	RT II - flux proof, RT III - wash tight
Relay weight	14 g
Packaging unit	20 / 500 pcs.
Accessories	see accessories RT

Dimensions

Dimensions in mm

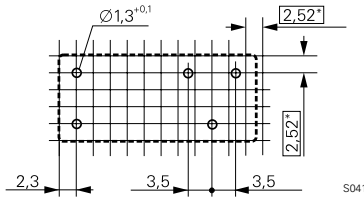


S0272-AB

PCB layout / terminal assigment

View on solder pins
Dimensions in mm

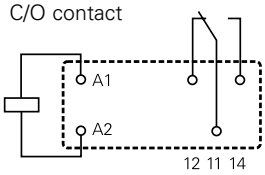
10 A, pinning 3.5 mm



S0418-BB

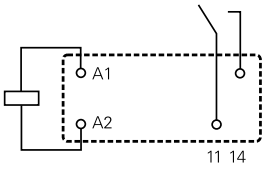
*) With the recommended PCB hole sizes a grid pattern from 2.5 mm to 2.54 mm can be used.

1 C/O contact



S0163-BG

1 N/O contact



S0163-BH

Product key

R T | | | 4 | | | |

Type

Version

1	**10 A, pinning 3.5 mm, flux proof**	**B**	10 A, pinning 3.5 mm, wash tight

Contacts

7	**1 C/O contact**	**8**	1 N/O contact

Contact material

4 AgNi 90/10

Coil

Coil code: please refer to coil versions table

Preferred types in bold print

Power PCB Relay RT1 Inrush

1 pole 16 A, for inrush peak currents up to 80 A

F0177-B

Features

- 1 N/O contact
- Sensitive coil 400 mW
- 5 kV / 10 mm coil-contact
- Protection class II (VDE 0700)
- Ambient temperature 85 °C
- Height 15.7 mm
- Sockets with PCB-type or screw-type terminals

Applications

Domestic appliances, heating control, lighting control

VDE cULus

Technical data of approved types on request

Contact data

Configuration	1 N/O contact
Type of contact	single contact
Rated current	16 A
Rated voltage / max.breaking voltage AC	250 Vac / 440 Vac
Maximum breaking capacity AC	4000 VA
Make current (max. 4 s at duty cycle 10%)	30 A
peak inrush current (20 ms)	80 A
Contact material	AgNi 90/10, AgSnO

Contact ratings

Type	Load	Operations
RT33K	1000 W, 250 Vac, incandescent lamps	typ. $9x10^4$
RT33L	1000 W, 250 Vac, incandescent lamps	typ. $8x10^4$
RT33L	compressor, 230 Vac, I_{in}≤21A_{peak}, I_{off}=3.5 A, cosφ=0.5	typ. $2.3x10^5$

Coil data

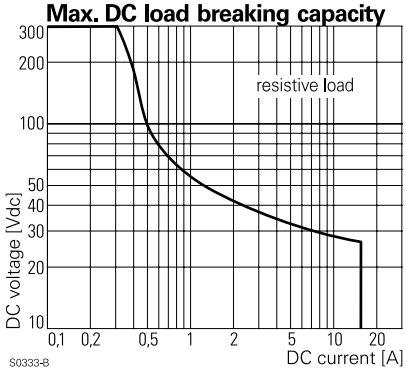
Nominal voltage	5...110 Vdc
Nominal coil power	400 mW
Operate category	2 / b

Coil versions, DC-coil

Coil code	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Maximum voltage Vdc	Coil resistance Ω	Coil current mA
012	**12**	**8.4**	**1.2**	**30.6**	**360±10%**	**33.3**
024	**24**	**16.8**	**2.4**	**61.2**	**1440±10%**	**16.7**
048	48	33.6	4.8	122.4	5520±10%	8.7
060	60	42.0	6.0	153.0	7340±12%	8.1

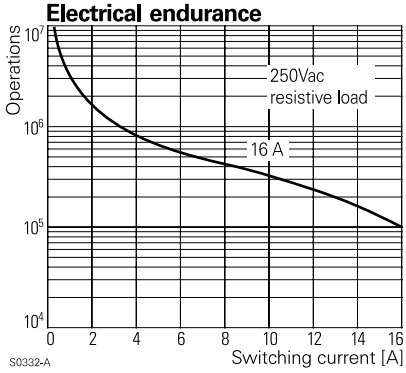
All figures are given for coil without preenergization, at ambient temperature +20 °C
Other coil voltages on request

Max. DC load breaking capacity



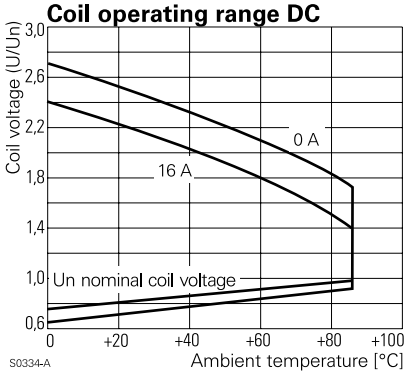
S0333-B

Electrical endurance



S0332-A

Coil operating range DC



S0334-A

Power PCB Relay RT1 Inrush

1 pole 16 A, for inrush peak currents up to 80 A

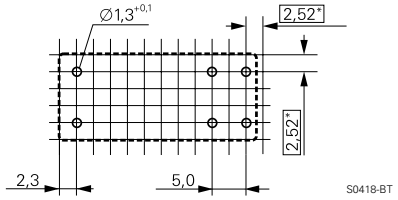
Insulation		
Dielectric strength	coil-contacts	5000 V_{rms}
	open contact circuit	1000 V_{rms}
Clearance / creepage		10 / 10 mm
Insulation to IEC 60664		
Voltage rating		250 V
Pollution degree		3
Overvoltage category		III
Insulation to VDE 0110b (2/79)		
Insulation category / reference voltage		C / 250

Other data	
Flammability class according to UL 94	V-0
Coil insulation system according to UL 1446	Class F
Ambient temperature	-40...+85 °C
Mechanical life	30x10^6 operations
Max. switching rate at rated- / minimum load	6 min^{-1} / 1200 min^{-1}
Operate- / release time	typ. 8 / 3 ms
Bounce time	typ. 2 ms
Vibration resistance	20 g, 30...500 Hz
Shock resistance (destruction)	100 g
Category of protection (IEC 61810)	RT II - flux proof, RT III - wash tight
Relay weight	14 g
Packaging unit	20 / 500 pcs.
Accessories	see accessories RT

PCB layout / terminal assigment

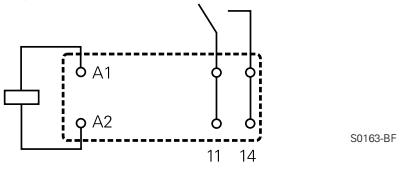
View on solder pins
Dimensions in mm

16 A, pinning 5 mm



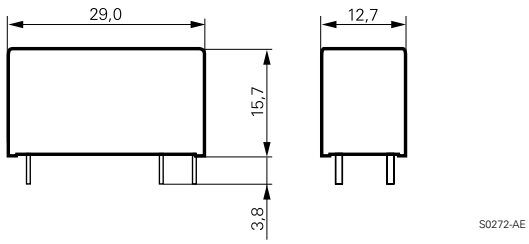
*) With the recommended PCB hole sizes a grid pattern from 2.5 mm to 2.54 mm can be used.

1 N/O contact



Dimensions

Dimensions in mm



Product key

R	T	3	3				

Type

Version
3 16 A, pinning 5 mm **D** 16 A, Pinning 5 mm, wash tight

Contacts
3 1 N/O contact

Contact material
K AgNi 90/10 **L** $AgSnO_2$

Coil
Coil code: please refer to coil versions table

Preferred types in bold print

Power PCB Relay RTH 105 °C sensitive

1 pole 10 A, high-temperature version

F0178-C

Features

- 1 N/O contact
- Sensitive coil 250 mW
- 5 kV / 10 mm coil-contact
- Protection class II (VDE 0700)
- Ambient temperature 105 °C at rated load
- Height 15.7 mm

Applications

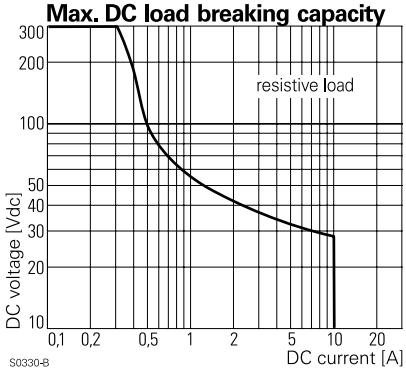
Domestic appliances, heating control

Technical data of approved types on request

Contact data

Configuration	1 N/O contact
Type of contact	single contact
Rated current	10 A
Rated voltage / max.breaking voltage AC	250 Vac / 440 Vac
Maximum breaking capacity AC	2500 VA
Make current (max. 4 s at duty cycle 10%)	15 A
Contact material	AgNi 90/10

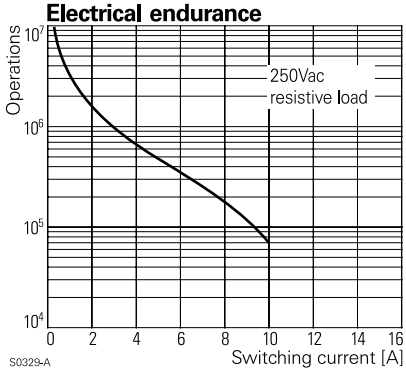
Max. DC load breaking capacity



Contact ratings

Type	Load	Operations
RTH84	12 A, 250 Vac, 105 °C, dry switching	>5x10^5
RTH84	10 A, 250 Vac, cyclical heat 105/40 °C	2x10^5
RTH84	10 A, 250 Vac, 105 °C	1.5x10^5

Electrical endurance



Coil data

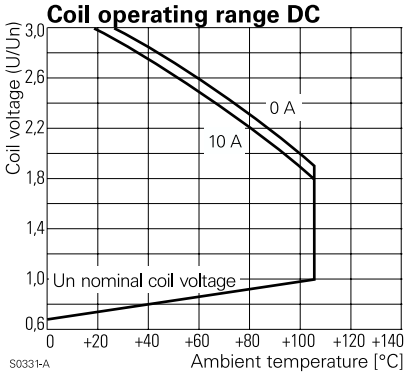
Nominal voltage	5...60 Vdc
Nominal coil power	250 mW
Operate category	2 / b

Coil versions, sensitive DC-coil

Coil code	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Maximum voltage Vdc	Coil resistance Ω	Coil current mA
012	12	9.0	1.2	36.0	576±10%	20.8
024	24	18.0	2.4	72.0	2304±10%	10.4

All figures are given for coil without preenergization, at ambient temperature +20 °C
Other coil voltages on request

Coil operating range DC



Power PCB Relay RTH 105°C sensitive

1 pole 10 A, high-temperature version

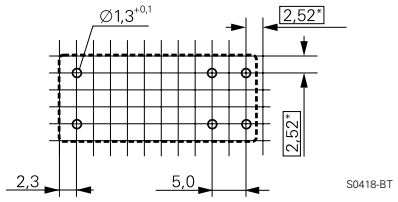
Insulation		
Dielectric strength	coil-contacts	5000 V_{rms}
	open contact circuit	1000 V_{rms}
Clearance / creepage		10 / 10 mm
Insulation to IEC 60664		
Voltage rating		250 V
Pollution degree		3
Overvoltage category		III
Insulation to VDE 0110b (2/79)		
Insulation category / reference voltage		C / 250

Other data	
Flammability class according to UL 94	V-0
Coil insulation system according to UL 1446	Class F
Ambient temperature	-40...+105 °C
Mechanical life	$10x10^6$ operations
Max. switching rate at rated- / minimum load	6 min^{-1} / 1200 min^{-1}
Operate- / release time	typ. 8 / 3 ms
Bounce time	typ. 2 ms
Vibration resistance	5 g, 30...150 Hz
Shock resistance (destruction)	100 g
Category of protection (IEC 61810)	RT II - flux proof
Relay weight	14 g
Packaging unit	20 / 500 pcs.

PCB layout / terminal assigment

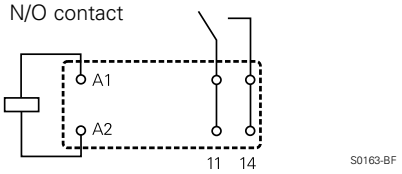
View on solder pins
Dimensions in mm

10 A, pinning 5 mm



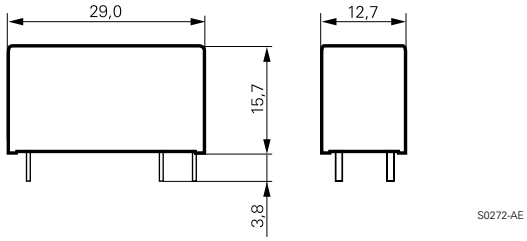
*) With the recommended PCB hole sizes a grid pattern from 2.5 mm to 2.54 mm can be used.

1 N/O contact



Dimensions

Dimensions in mm



Product key

R T	H	8	4		

Type

Version
H 10 A, pinning 5 mm, 105°C

Contacts
8 1 N/O contact

Contact material
4 AgNi 90/10

Coil
Coil code: please refer to coil versions table

Power PCB Relay RTH 105 °C 16A

1 pole 16 A, high-temperature version

F0220-C

Features

- 1 C/O or 1 N/O contact
- Sensitive coil 400 mW
- 5 kV / 10 mm coil-contact
- Protection class II (VDE 0700)
- Ambient temperature 105°C at rated load
- Height 15.7 mm

Applications

Oven control, cooking plate control

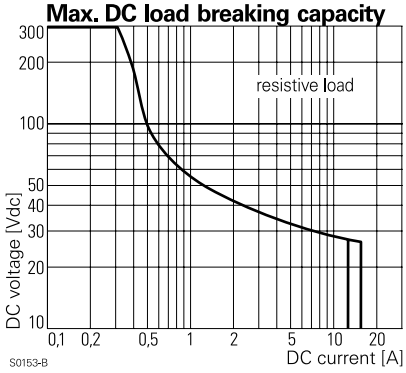
VDE c UL us

Technical data of approved types on request

Contact data

Configuration	1 C/O contact or 1 N/O contact
Type of contact	single contact
Rated current	16 A [1]
Rated voltage / max.breaking voltage AC	250 Vac / 440 Vac
Maximum breaking capacity AC	4000 VA
Make current (max. 4 s at duty cycle 10%)	30 A
Contact material	AgNi 90/10

Max. DC load breaking capacity



Contact ratings

Type	Load	Operations	standard
RTH34	10 A, 250 Vac, 105 °C	$1.5x10^5$	EN 61810/T1
RTH34	16 A, 250 Vac, 105 °C	$2x10^4$	
RTHH4	10 A, 250 Vac, 105 °C	typ. $3x10^5$	
RTHH4	16 A ON / 8 A OFF, 250 Vac,105 °C	typ. $2.5x10^5$	
RTH4	16 A, 250 Vac, 105 °C, C/O contact	$2x10^4$	EN 61810/T1

Coil data

Nominal voltage	5...60 Vdc
Nominal coil power	400 mW [1]
Operate category	90 - 110 % U_{nom}

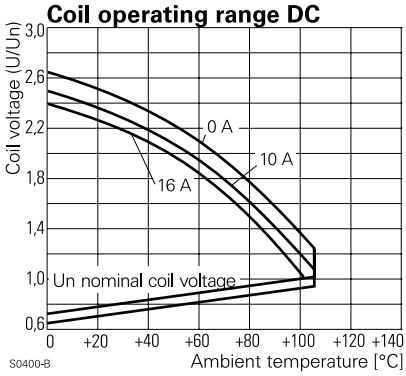
Coil versions, DC-coil

Coil code	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Maximum voltage Vdc	Coil resistance Ω	Coil current mA
009	9	6.3	0.9	22.9	203±10%	44.3
012	12	8.4	1.2	30.6	360±10%	33.3
024	24	16.8	2.4	61.2	1440±10%	16.7

All figures are given for coil without preenergization, at ambient temperature +20 °C
Other coil voltages on request

[1] Continuous thermal load > 10 A at 105°C requires reduction of coil power to 64% of nominal power after 100 ms

Coil operating range DC



Power PCB Relay RTH 105 °C 16A

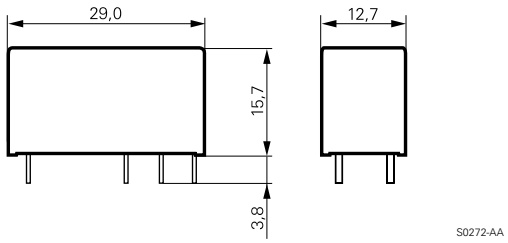
1 pole 16 A, high-temperature version

Insulation		
Dielectric strength	coil-contacts	5000 V_{rms}
	open contact circuit	1000 V_{rms}
Clearance / creepage		10 / 10 mm
Insulation to IEC 60664		
Voltage rating		250 V
Pollution degree		3
Overvoltage category		III
Insulation to VDE 0110b (2/79)		
Insulation category / reference voltage		C / 250

Other data	
Flammability class according to UL 94	V-0
Coil insulation system according to UL 1446	Class F
Ambient temperature	-40...+105 °C
Mechanical life	10x10^6 operations
Max. switching rate at rated- / minimum load	6 min^{-1} / 1200 min^{-1}
Operate- / release time	typ. 7 / 3 ms
Bounce time N/O contact / N/C contact	typ. 1 / 3 ms
Vibration resistance N/O / N/C contact	20 / 5 g, 30...150 Hz
Shock resistance (destruction)	100 g
Category of protection (IEC 61810)	RT II - flux proof
Relay weight	14 g
Packaging unit	20 / 500 pcs.

Dimensions

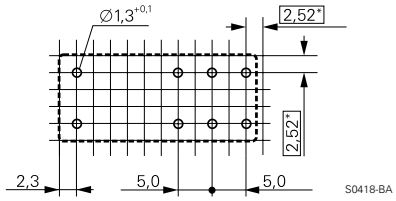
Dimensions in mm



PCB layout / terminal assigment

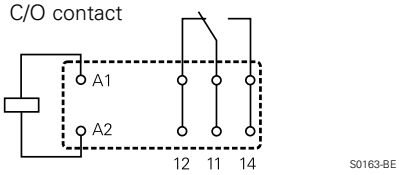
View on solder pins
Dimensions in mm

16 A, pinning 5 mm

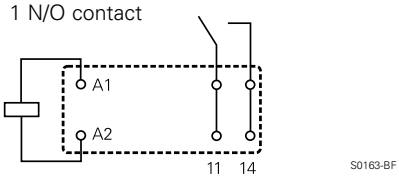


*) With the recommended PCB hole sizes a grid pattern from 2.5 mm to 2.54 mm can be used.

1 C/O contact



1 1 N/O contact



Product key

R	T	H		4			

Type

Version
- **H** 16 A, pinning 5 mm, 105°C

Contacts
- **1** 1 C/O contact
- **3** 1 N/O contact
- **H** 1 N/O contact "High Performance"

Contact material
- **4** AgNi 90/10

Coil
- Coil code: please refer to coil versions table

Power PCB Relay RP II/1

1 pole 8 / 12 / 16 A

F0146-B

Features

- 1 C/O or 1 N/O contact
- 4 kV / 8 mm coil-contact
- Pinning 3.5 or 5 mm (8 / 12 A) and 5 mm (16 A)
- Sockets with PCB-type or screw-type terminals

Applications

Power supplies, domestic appliances, heating control, installation

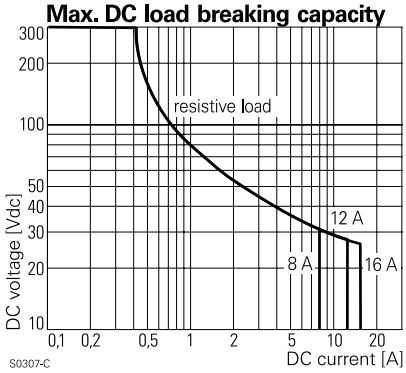
8 A version:
12 A version:
16 A version:

Technical data of approved types on request

Contact data

Configuration	1 C/O contact or 1 N/O contact		
Type of contact	single contact		
Rated current	8 A	12 A	16 A
Rated voltage / max.breaking voltage AC	250 Vac / 440 Vac		
Maximum breaking capacity AC	2000 VA	3000 VA	4000 VA
Make current	16 A	20 A	25 A
Contact material	Ag	AgCdO	AgCdO

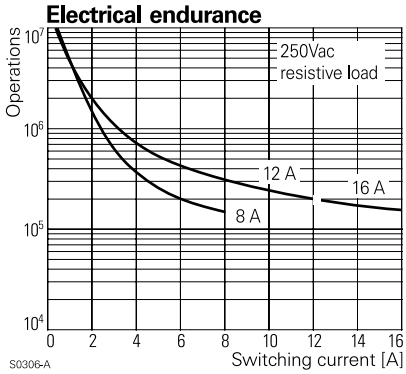
Max. DC load breaking capacity



Contact ratings

Type	Load	Operations	Standard
RP410	12 A, 250 Vac, cosφ=1, 1200/h, 40% duty cycle	$1.1x10^5$	AC 1
RP410	9.1 A, 220 Vac, cosφ=1, 360/h, 15% duty cycle	$2x10^5$	AC 1
RP418	3.4 A ON, 0.42 A OFF, 220 Vac, cosφ=0.6	$>1.1x10^6$	
RP411	8 A, 250 Vac, cosφ=1, 50% duty cycle	10^5	AC 1
RP412	8 A, 250 Vac, cosφ=1, 50% duty cycle	10^5	AC 1
RP330	18.2 A, 250 Vac, cosφ=1, 600/h, 15% duty cycle	$1.1x10^5$	AC 1
RP330	96 A ON, 16 A OFF, 250 Vac, cosφ=0.6	$> 3x10^4$	VDE 0630

Electrical endurance



Coil data

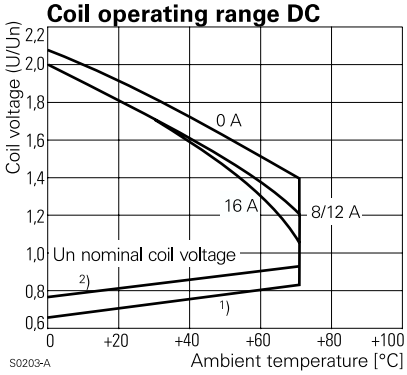
Nominal voltage	5...110 Vdc
Nominal coil power	500 mW
Operate category	2 / b

Coil versions, DC-coil

Coil code	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Maximum voltage Vdc	Coil resistance Ω	Coil current mA
005	5	3.5	0.5	9.0	54±10%	92.6
006	6	4.2	0.6	10.8	68±10%	88.2
012	12	8.4	1.2	21.6	270±10%	44.4
024	24	16.8	2.4	43.2	1100±15%	21.8
048	48	33.6	4.8	86.4	4400±15%	10.9
060	60	42.0	6.0	108.0	6540±15%	9.2
110	110	77.0	11.0	198.0	23100±15%	4.8

All figures are given for coil without preenergization, at ambient temperature +20 °C
Other coil voltages on request

Coil operating range DC



Power PCB Relay RP II/1

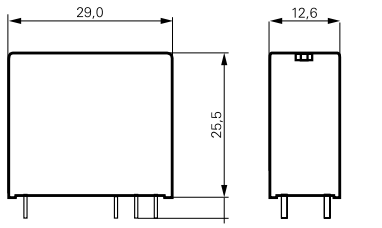
1 pole 8 / 12 / 16 A

Insulation		
Dielectric strength	coil-contacts	4000 V_{rms}
	open contact circuit	1000 V_{rms}
Clearance / creepage		8 / 8 mm
Insulation to IEC 60664		
Voltage rating		250 V
Pollution degree		3
Overvoltage category		III
Insulation to VDE 0110b (2/79)		
Insulation category / reference voltage		C / 250

Other data	
Ambient temperature	-40...+70 °C
Mechanical life	30x10^6 operations
Max. switching rate at rated- / minimum load	10 min^{-1} / 1200 min^{-1}
Operate- / release time	typ. 8 / 2 ms
Bounce time N/O contact/N/C contact	typ. 2 / 4 ms
Vibration resistance N/O contact/N/C contact	>10 / 2 g, 30...300 Hz
Shock resistance (destruction)	100 g
Category of protection (IEC 61810)	RT II - flux proof, RT III - wash tight
Relay weight	18 g
Packaging unit	20 / 500 pcs.
Accessories	see accessories RP

Dimensions

Dimensions in mm

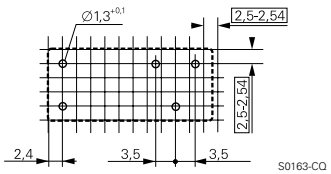


S0273-AA

PCB layout / terminal assigment

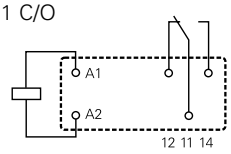
View on solder pins
Dimensions in mm

8 / 12 A, pinning 3.5 mm



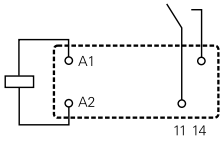
S0163-CQ

1 C/O



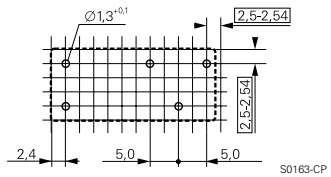
S0163-BG

1 N/O



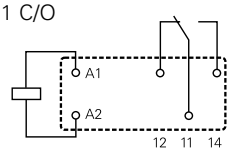
S0163-BH

8 / 12 A, pinning 5 mm



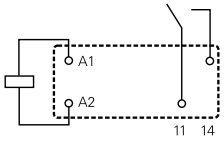
S0163-CP

1 C/O



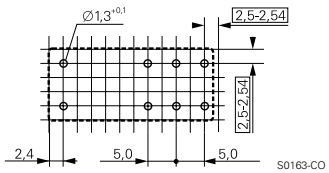
S0163-BC

1 N/O



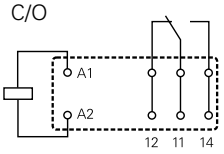
S0163-BD

16 A, pinning 5 mm



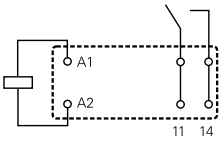
S0163-CO

1 C/O



S0163-BE

1 N/O



S0163-BF

Product key

R P

Type

Version

3	**16 A, flux proof**	**7**	**16 A, wash tight**
4	**8/12 A, flux proof**	**8**	8/12 A, wash tight

Contacts

1	1 C/O contact	**3**	1 N/O contact

Contact material

0	**AgCdO, 16 A or 12 A, pinning 5 mm**	**2**	**Ag 8 A, pinning 3.5 mm**
1	Ag 8 A, pinning 5 mm	**8**	**AgCdO, 12 A, pinning 3.5 mm**

Coil

Coil code: please refer to coil versions table

Preferred types in bold print

Special Load PCB Relay RP3SL

**1 pole 16 A, for high inrush currents,
mono- or bistable**

F0147-A

Features

- 1 N/O contact
- 120 A / 20 ms inrush peak current
- DC- or bistable version
- 4 kV / 8 mm coil-contact

Applications

Lighting control, timers, motor control, building automation

Technical data of approved types on request

Contact data

Configuration	1 N/O contact
Type of contact	single contact
Rated current	16 A
Rated voltage / max.breaking voltage AC	250 Vac / 440 Vac
Maximum breaking capacity AC	4000 VA
Make current (max. 4 s at duty cycle 10%)	25 A
Peak inrush current	120 A
Contact material	AgSnO

Contact ratings

Type	Load	Operations	Standard
RP3SL	12 A, 250 Vac, cosφ=1	$3x10^5$	
RP3SL	TV 8	$25x10^3$	UL 508
RP3SL	2500 W, 230 Vac, halogen lamps	$>10^4$	
RP3SL	1000 W, 250 Vac, incandescent lamps	$2.3x10^5$	
RP3SL	3000 W, 250 Vac, incandescent lamps	$3.6x10^4$	
RP3SL	1500 VA, fluorescent lamps 163 µF	10^4	

Coil data monostable DC coil

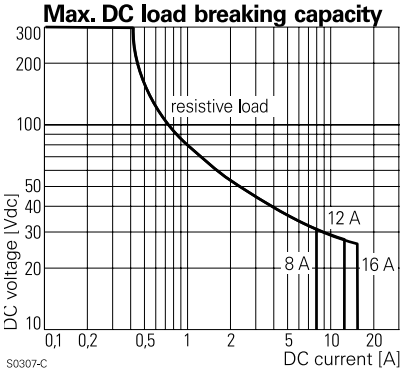
Nominal voltage	5...110 Vdc
Nominal coil power	500 mW
Operate category	2 / b

Coil versions monostable DC coil

Coil code	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Maximum voltage Vdc	Coil resistance Ω	Coil current mA
012	**12**	**9.0**	**1.2**	**21.6**	**270±10%**	**44.4**
024	**24**	**18.0**	**2.4**	**43.2**	**1100±15%**	**21.8**
048	48	36.0	4.8	86.4	4400±15%	10.9
060	60	45.0	6.0	108.0	6540±15%	9.2

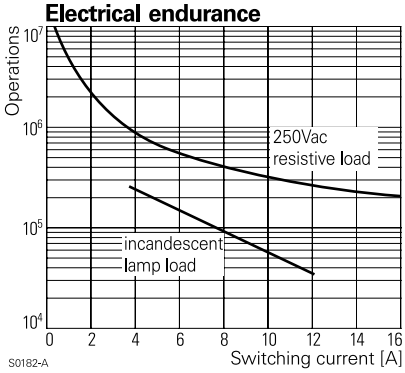
All figures are given for coil without preenergization, at ambient temperature +20 °C
Other coil voltages on request

Max. DC load breaking capacity



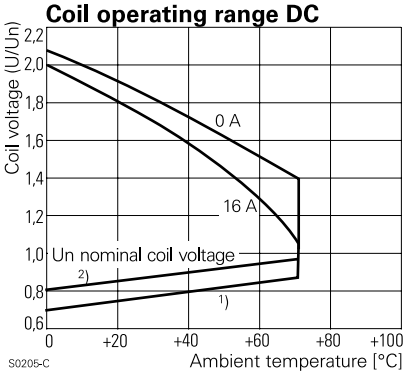
S0307-C

Electrical endurance



S0182-A

Coil operating range DC



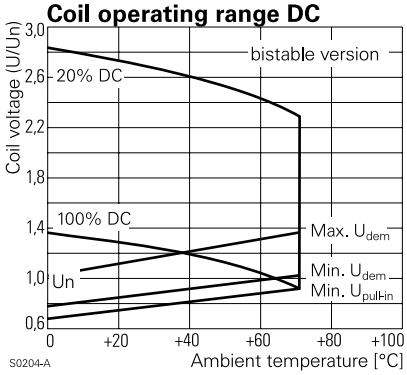
S0205-C

Special Load PCB Relay RP3SL

**1 pole 16 A, for high inrush currents,
mono- or bistable**

Coil data bistable	1 coil	2 coils
Nominal voltage	5...110 Vdc	5...60 Vdc
Nominal coil power	1.2...1.4 W	1.2...1.5 W
Minimum energization time	20 ms	
Reset voltage min.	70 % U_{nom}	75 % U_{nom}
Reset voltage max.	110 % U_{nom}	120 % U_{nom}

Coil operating range DC

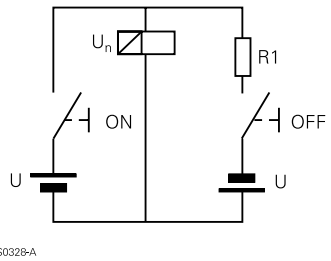


Coil versions bistable

Coil code	Nominal voltage Vdc	Pull-in voltage Vdc	Reset voltage Vdc	Reset R1 Ω / W	Coil resistance Ω	Coil current mA
bistable, 1 coil						
A05	5	3.7	3.6	39 / 0.5	21±10%	238.1
A12	12	9.0	8.7	220 / 0.5	115±10%	104.3
A24	24	18.0	16.7	820 / 0.5	460±10%	52.2
bistable, 2 coils						
F12	12	9.0	9.0		105±15%	114.3
F24	24	18.0	18.0		460±15%	52.2

All figures are given for coil without preenergization, at ambient temperature +20 °C, duty cycle 20%
Other coil voltages on request

Circuit scheme for bistable 1 coil



Insulation		
Dielectric strength	coil-contacts	4000 V_{rms}
	open contact circuit	2000 V_{rms}
Clearance / creepage		8 / 8 mm
Insulation to IEC 60664		
Voltage rating		250 V
Pollution degree		3
Overvoltage category		III
Insulation to VDE 0110b (2/79)		
Insulation category / reference voltage		C / 250

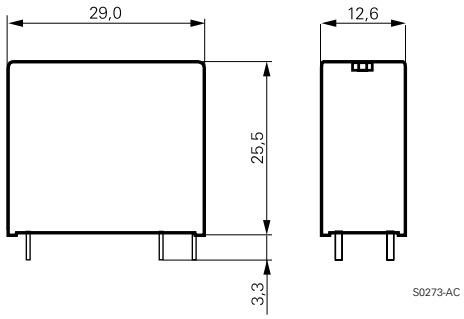
Other data		
Ambient temperature	-40...+70 °C	
Mechanical life	30x10⁶ operations	
Max. switching rate at rated- / minimum load	10 min^{-1} / 1200 min^{-1}	
Operate- / release time monostable	typ. 8 / 2 ms	
Operate- / reset time bistable	typ. 6 / 2 ms	
Bounce time	typ. 2 ms	
Vibration resistance	20 g, 30...300 Hz	
Shock resistance (destruction)	100 g	
Protection category	RT II - flux proof, RT III - wash tight	
Relay weight	18 g	
Packaging unit	1 coil	20 / 500 pcs.
	2 coils	25 / 100 pcs.
Accessories	see accessories RP	

Special Load PCB Relay RP3SL

**1 pole 16 A, for high inrush currents,
mono- or bistable**

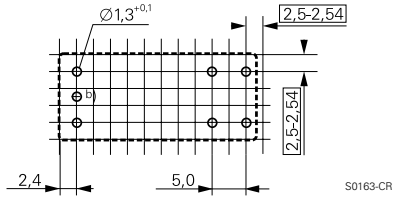
Dimensions

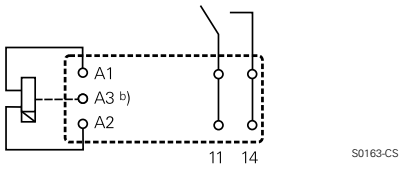
Dimensions in mm



PCB layout / terminal assigment

View on solder pins
Dimensions in mm





Bistable versions:
Indicated contact position during or after coil energization with reset voltage.

2-coil versions:
Operate A2, A3
Reset A1, A3

b) for 2 coil version only

Product key

R	P		S	L			

Type

Version
3 **flux proof** **7** wash tight

Contacts / contact material
SL 1 N/O contact, AgSnO

Coil
Coil code: please refer to coil versions table

Preferred types in bold print

Faston Power Relay RPH

1 pole 16 A

F0148-B

Features

- 1 N/O or 1 N/C contact
- 16 A rated current
- Switching capacity 4000 VA
- Coil power 360 mW
- 4 kV / 8 mm coil-contact, insulation to VDE 0631 and 0700
- Ambient temperature up to 125 °C
- Faston-terminals for load side

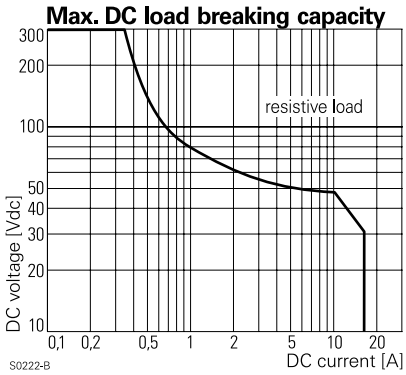
Applications

Oven control, electric heating, power suppplies, air conditionning

Technical data of approved types on request

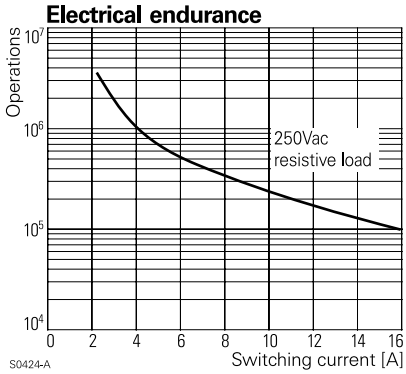
Contact data

Configuration	1 N/O contact or 1 N/C contact
Type of contact	single contact
Rated current	16 A
Rated voltage / max.breaking voltage AC	250 Vac / 440 Vac
Maximum breaking capacity AC	4000 VA
Make current (max. 4 s at duty cycle 10%)	25 A
Contact material	AgCdO
Minimum contact load	500 mA, 12 Vac



Contact ratings

Type	Load	Operations
RPH3	10 A, 400 Vac, resistive, 125 °C	$2x10^5$
RPH3	16 A, 250 Vac, resistive, 125 °C	$1x10^5$
RPH5	10 A, 400 Vac, resistive, 125 °C	$5x10^4$
RPH5	16 A, 250 Vac, resistive, 125 °C	$5x10^4$



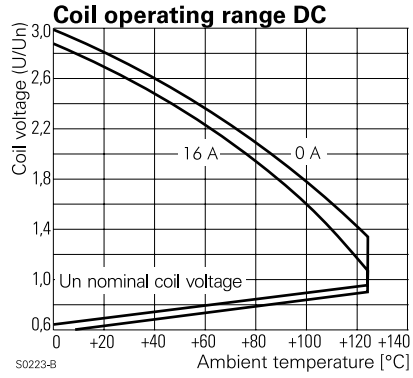
Coil data

Nominal voltage	6...48 Vdc
Nominal coil power	360 mW
Operate category	1 / c

Coil versions

Coil code	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Maximum voltage Vdc	Coil resistance Ω	Coil current mA
006	6	3.8	0.6	16.9	100±10%	60.0
012	12	7.5	1.2	33.8	400±10%	30.0
024	24	14.9	2.4	67.7	1600±10%	15.0
048	48	30.0	4.8	135.3	6400±10%	7.5

All figures are given for coil without preenergization, at ambient temperature +20 °C
Other coil voltages on request



Faston Power Relay RPH

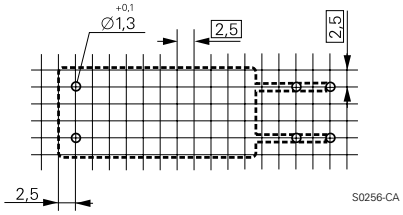
1 pole 16 A

Insulation		
Dielectric strength	coil-contacts	4000 V_{rms}
	open contact circuit	1000 V_{rms}
Clearance / creepage		8 / 8 mm
Insulation to IEC 60664		
Voltage rating		250 V
Pollution degree		3
Overvoltage category		III
Insulation to VDE 0110b (2/79)		
Insulation category / reference voltage		C / 250, B / 380
Tracking resistance of relay base		PTI 250

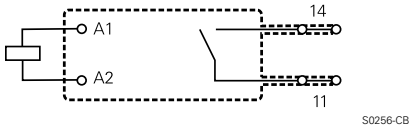
Other data	
Flammability class according to UL 94	V-0
Ambient temperature	-40...+125 °C
Mechanical life	30x10^6 operations
Max. switching rate at rated- / minimum load	10 min^{-1} / 1200 min^{-1}
Operate- / release time	10 / 2 ms
Bounce time N/O contact/N/C contact	1 / 2 ms
Category of protection (IEC 61810)	RT II - flux proof
Relay weight	26 g
Packaging unit	15 / 300 pcs.

PCB layout / terminal assigment

View on solder pins
Dimensions in mm

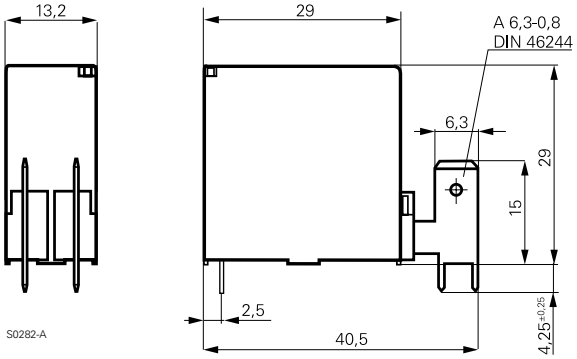


1 N/O contact

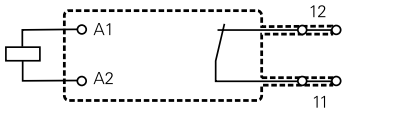


Dimensions

Dimensions in mm



1 N/C contact



Product key

R	P	H		O			

Type
Faston power relay

Contact configuration
3 1 N/O contact
5 1 N/C contact

Contact material
0 AgCdO

Coil
Coil code: please refer to coil versions table

Power PCB Relay RP I

1 pole 8 A

F0151-B

Features

- 1 C/O or 1 N/O contact
- 4 kV coil-contact
- Vertical and horizontal version
- Version with twin contacts
- Wash tight

Applications

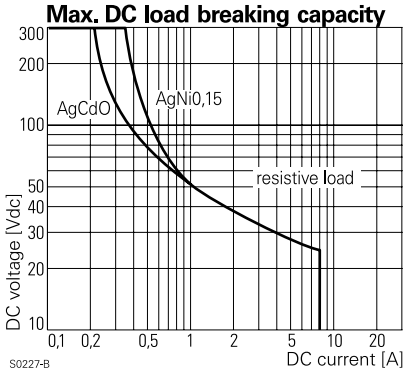
I/O modules, heating control, timers

Technical data of approved types on request

Contact data

Configuration	1 C/O contact or 1 N/O contact
Type of contact	standard: single contact
Rated current	8 A
Rated voltage / max.breaking voltage AC	250 Vac / 440 Vac
Maximum breaking capacity AC	2000 VA
Make current (max. 4 s at duty cycle 10%)	15 A
Contact material	AgCdO, Ag

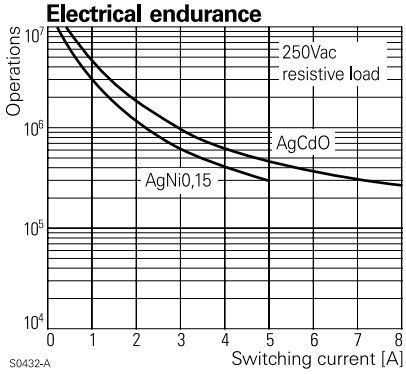
Max. DC load breaking capacity



Contact ratings

Type	Load	Operations
RP531	4 A, 30 Vdc, resistive	$2x10^6$
RP531	1 A, 24 Vdc, inductive L / R=40ms	$2x10^5$
RP530	1 A, 230 Vac, cosφ=0.4	$5x10^5$

Electrical endurance



Coil data

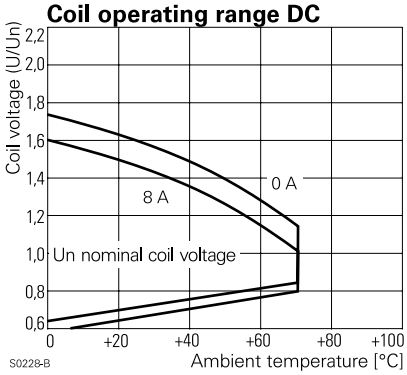
Nominal voltage	6...60 Vdc
Nominal coil power	450...500 mW
Operate power	240 mW

Coil versions

Coil code	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Maximum voltage Vdc	Coil resistance Ω	Coil current mA
006	6	4.0	0.6	10.6	80±10%	75.0
012	12	8.0	1.2	21.5	330±10%	36.4
024	24	16.0	2.4	40.0	1200±15%	20.0
048	48	32.0	4.8	79.0	4700±15%	10.2
060	60	40.0	6.0	98.0	7200±15%	8.3

All figures are given for coil without preenergization, at ambient temperature +20°C
Other coil voltages on request

Coil operating range DC



Power PCB Relay RP I

1 pole 8 A

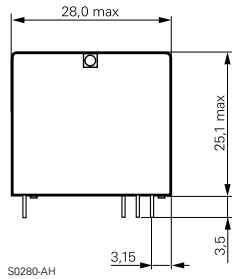
Insulation		
Dielectric strength	coil-contacts	4000 V_{rms}
	open contact circuit	1000 V_{rms}
Clearance / creepage		4 / 4 mm
Insulation to IEC 60664		
Voltage rating		250 V
Pollution degree		3
Overvoltage category		III
Insulation to VDE 0110b (2/79)		
Insulation category / reference voltage		C / 250
Tracking resistance of relay base		CTI 250

Other data	
Flammability class according to UL 94	V-0
Ambient temperature	-40...+70 °C
Mechanical life	approx. $20x10^6$ operations
Max. switching rate at rated- / minimum load	6 min^{-1} / 20 s^{-1}
Operate- / release time	7 / 3 ms
Bounce time N/O contact/N/C contact	0.5 / 3 ms
Category of protection (IEC 61810)	RT III - wash tight
Relay weight	14 g
Packaging unit	20 / 400 pcs.
Accessories	see accessories RP

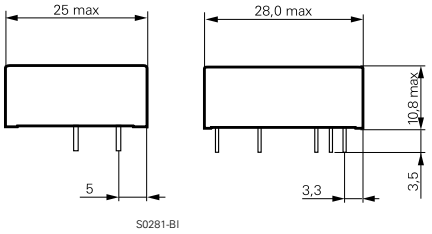
Dimensions

Dimensions in mm

Vertical version

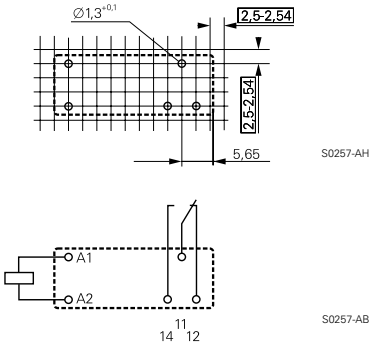


Horizontal version

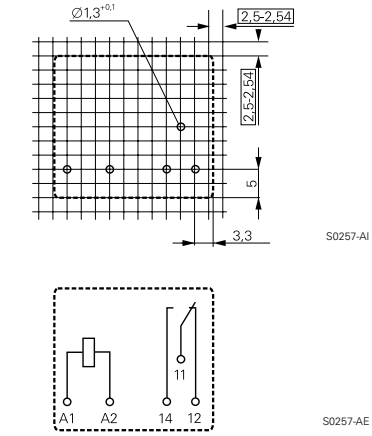


PCB layout / terminal assigment

Vertical version



Horizontal version



View on solder pins

Dimensions in mm

Product key

R	P						

Type
RP-Relays

Version
5 vertical, wash tight
6 horizontal, wash tight

Contact configuration
1 1 C/O contact **3** 1 N/O contact

Contact material
0 AgCdO **1** Ag
7 Ag, twin contacts (only in C/O version)

Coil
Coil code: please refer to coil versions table

Power PCB Relay RT2

2 pole 8 A, DC and AC-coil

F0149-B

Features

- 2 C/O or 2 N/O contacts
- Sensitive coil 400 mW
- DC- or AC-coil
- 5 kV / 10 mm coil-contact
- Protection class II (VDE 0700)
- Height 15.7 mm
- Sockets with PCB-type or screw-type terminals

Applications

Domestic appliances, heating control, emergency lighting, modems

Technical data of approved types on request

Contact data

Configuration	2 C/O contact or 2 N/O contact
Type of contact	single contact
Rated current	8 A
Rated voltage / max.breaking voltage AC	250 Vac / 440 Vac
Maximum breaking capacity AC	2000 VA
Make current (max. 4 s at duty cycle 10%)	15 A
Contact material	AgNi 90/10, AgNi 90/10 gold plated

Contact ratings

Type	Load	Operations	Standard
RT 424	4 A, 230 Vac, cosφ=0.6	$1.5x10^5$	
RT 424	6 (2) A, 250 Vac, on the N/O- N/C contact		VDE 0631
RT 424	1/2 hp / 240 Vac, 1/4 hp / 120 Vac	$6x10^3$	UL 508

Coil data

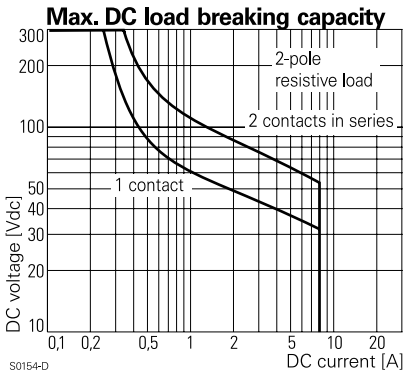
Nominal voltage	DC coil	5...110 Vdc
	AC coil	24...230 Vac
Nominal coil power	DC coil	400 mW
	AC coil	0.75 VA
Operate category		2 / b

Coil versions, DC-coil

Coil code	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Maximum voltage Vdc	Coil resistance Ω	Coil current mA
005	5	3.5	0.5	12.7	62±10%	80.0
006	6	4.2	0.6	15.3	90±10%	66.7
012	12	8.4	1.2	30.6	360±10%	33.3
024	24	16.8	2.4	61.2	1440±10%	16.7
048	48	33.6	4.8	122.4	5520±10%	8.7
060	60	42.0	6.0	153.0	7340±12%	8.1
110	110	77.0	11.0	280.5	26600±12%	4.1

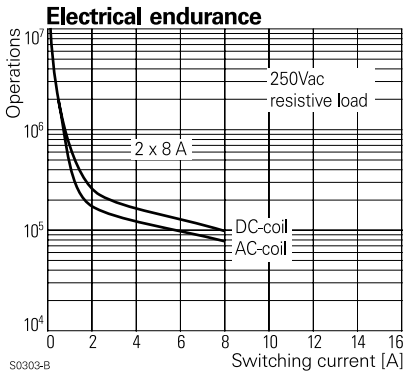
All figures are given for coil without preenergization, at ambient temperature +20 °C
Other coil voltages on request

Max. DC load breaking capacity



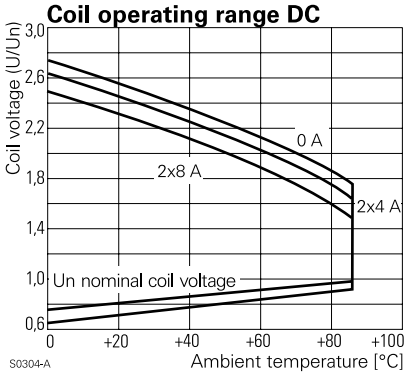
S0154-D

Electrical endurance



S0303-B

Coil operating range DC



S0304-A

Power PCB Relay RT2

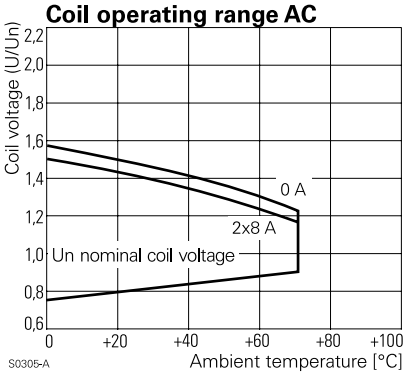
2 pole 8 A, DC and AC-coil

Coil versions, AC-coil

Coil code	Nominal voltage Vac	Pull-in voltage Vac	Release voltage Vac	Maximum voltage Vac	Coil resistance Ω	Coil current mA
524	24	18.0	3.6	36.0	350±10%	31.6
615	115	86.3	17.3	172.5	8100±15%	6.6
730	230	172.5	34.5	345.0	32500±15%	3.2

All figures are given for coil without preenergization, at ambient temperature +20°C

Coil operating range AC



Insulation

Dielectric strength	coil-contacts	5000 V_{rms}
	open contact circuit	1000 V_{rms}
	adjacent contacts	2500 V_{rms}
Clearance / creepage		10 / 10 mm
Insulation to IEC 60664		
Voltage rating		250 V
Pollution degree		3
Overvoltage category		III
Insulation to VDE 0110b (2/79)		
Insulation category / reference voltage		C / 250

Other data

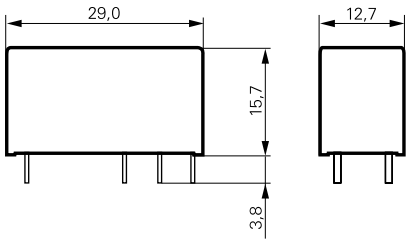
Flammability class according to UL 94		V-0
Coil insulation system according to UL 1446		Class F
Ambient temperature		-40...+70 °C
Mechanical life	DC-coil	>30x10⁶ operations
	AC-coil	>5x10⁶ operations
Max. switching rate at rated- / minimum load		6 min^{-1} / 1200 min^{-1}
Operate- / release time DC-coil		typ. 7 / 2 ms
Bounce time N/O contact/N/C contact		typ. 1 / 3 ms
Vibration resistance N/O / N/C contact		20 / 5 g, 30...300 Hz
Shock resistance (destruction)		100 g
Category of protection (IEC 61810)		RT II - flux proof, RT III - wash tight
Relay weight		13 g
Packaging unit		20 / 500 pcs.
Accessories		see accessories RT

Power PCB Relay RT2

2 pole 8 A, DC and AC-coil

Dimensions

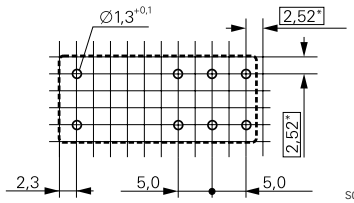
Dimensions in mm



S0272-AA

PCB layout / terminal assigment

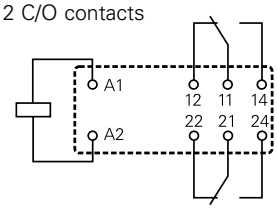
View on solder pins
Dimensions in mm



S0418-BA

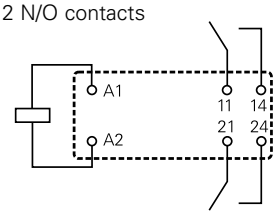
*) With the recommended PCB hole sizes a grid pattern from 2.5 mm to 2.54 mm can be used.

2 C/O contacts



S0163-BJ

2 N/O contacts



S0163-BK

Product key

R T | 4 | | | | |

Type

Version

4	**8 A, pinning 5 mm, flux proof**	**E**	8 A, pinning 5 mm, wash tight

Contacts

2	**2 C/O contacts**	**4**	2 N/O contacts

Contact material

4	AgNi 90/10	**5**	AgNi 90/10 gold plated

Coil

Coil code: please refer to coil versions table

Preferred types in bold print

Power PCB Relay RT2 bistable

2 pole 8 A, polarized bistable version

F0219-B

Features

- 2 C/O contacts
- Bistable with 1 or 2 coils
- 5 kV / 10 mm coil-contact
- Height 15.7 mm
- Cadmium-free contacts
- Protection class II (VDE 0700)

Applications

Battery powered equipment or applications with "memory function" (e.g. mains failure)

VDE c UL us

Technical data of approved types on request

Contact data	
Configuration	2 C/O contact
Type of contact	single contact
Rated current	8 A
Rated voltage / max.breaking voltage AC	250 Vac / 440 Vac
Maximum breaking capacity AC	2000 VA
Make current (max. 4 s at duty cycle 10%)	15 A
Contact material	AgNi 90/10

Coil data	1 coil	2 coils
Nominal voltage	5...24 Vdc	
Nominal coil power	typ. 400 mW	typ. 600 mW
Minimum energization time	30 ms	
Information on reduced pulse duration with higher energization voltages on demand		
Max. energization time for version with 2 coils	1 min at <10% duty cycle	
Reset voltage min.	70 % U_{nom}	70 % U_{nom}
Reset voltage max.	120 % U_{nom}	150 % U_{nom}

Coil versions, bistable

Coil code	Nominal voltage Vdc	Pull-in voltage Vdc	Reset voltage Vdc	Coil resistance Ω	Coil current mA
bistable, 1 coil					
A05	5	3.5	3.5	62±10%	80.0
A06	6	4.2	4.2	90±10%	66.7
A12	**12**	**8.4**	**8.4**	**360±10%**	**33.3**
A24	**24**	**16.8**	**16.8**	**1440±10%**	**16.7**
bistable, 2 coils					
F05	5	3.5	3.5	42±10%	120.0
F06	6	4.2	4.2	55±10%	110.0
F12	**12**	**8.4**	**8.4**	**240±10%**	**50.0**
F24	**24**	**16.8**	**16.8**	**886±10%**	**27.0**

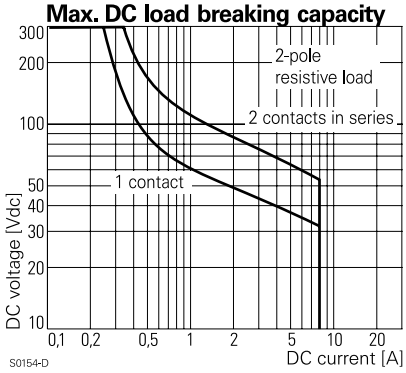
All figures are given for coil without preenergization, at ambient temperature +20 °C
Other coil voltages on request

Coils - operation

Version	1 coil		2 coils		
Coil terminals	A1	A2	A1	A3	A2
Pull-in	+	−		+	−
Reset	−	+	−	+	

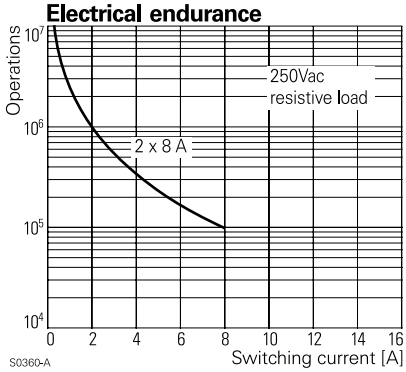
Contact position not defined at delivery

Max. DC load breaking capacity



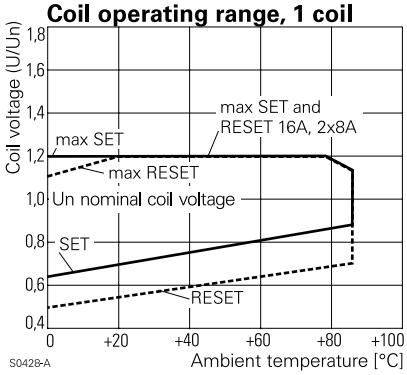
S0154-D

Electrical endurance



S0360-A

Coil operating range, 1 coil



S0428-A

Power PCB Relay RT2 bistable

2 pole 8 A, polarized bistable version

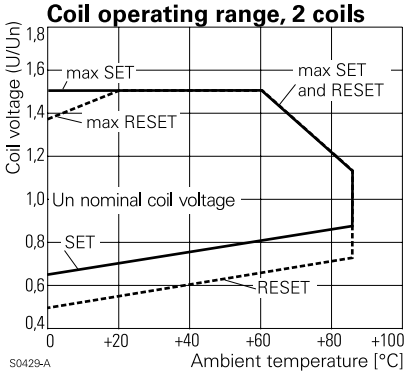
Insulation

Dielectric strength	coil-contacts	5000 V_{rms}
	open contact circuit	1000 V_{rms}
	adjacent contacts	2500 V_{rms}
Clearance / creepage		10 / 10 mm
Insulation to IEC 60664		
Voltage rating		250 V
Pollution degree		3
Overvoltage category		III
Insulation to VDE 0110b (2/79)		
Insulation category / reference voltage		C / 250

Other data

Flammability class according to UL 94		V-0
Coil insulation system according to UL 1446		Class F
Ambient temperature		-40...+85 °C (UL: +70 °C)
Mechanical life		$2x10^6$ operations
Max. switching rate at rated- / minimum load		6 min^{-1} / 600 min^{-1}
Operate- / release time		typ. 5 / 3 ms
Bounce time N/O contact/N/C contact		typ. 1 / 4 ms
Vibration resistance / shock resistance		
opening N/C contact		3 / 5 g
opening closed N/O contact		6 / 15 g
Shock resistance (destruction)		100 g
Category of protection (IEC 61810)		RT II - flux proof, RT III - wash tight
Relay weight		13 g
Packaging unit	1 coil	20 / 500 pcs.
	2 coils	25 / 100 pcs.
Accessories		see accessories RT

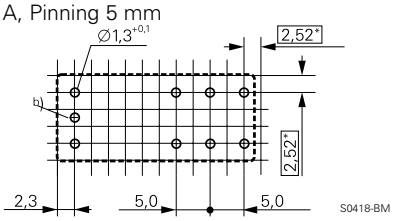
Coil operating range, 2 coils



PCB layout / terminal assigment

View on solder pins
Dimensions in mm

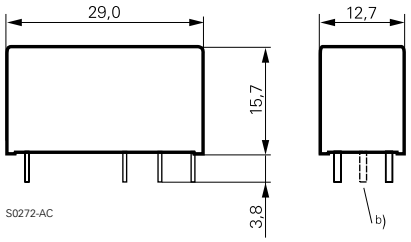
8 A, Pinning 5 mm



*) With the recommended PCB hole sizes a grid pattern from 2.5 mm to 2.54 mm can be used.

Dimensions

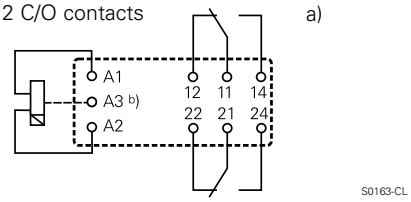
Dimensions in mm



a) Indicated contact position while or after coil energization with reset voltage.

b) for 2 coil version only

2 C/O contacts a)



Product key

R	T	4	2	4			

Type

Version

4 8 A, pinning 5 mm, flux proof **E** wash tight

Contacts

2 2 C/O contacts

Contact material

4 AgNi 90/10

Coil

Coil code: please refer to coil versions table

Preferred types in bold print

Power PCB Relay RP II/2

2 pole 8 A

F0150-B

Features

- 2 C/O or 2 N/O contacts
- 4 kV / 8 mm coil-contact
- Twin contacts available
- Sockets with PCB-type or screw-type terminals

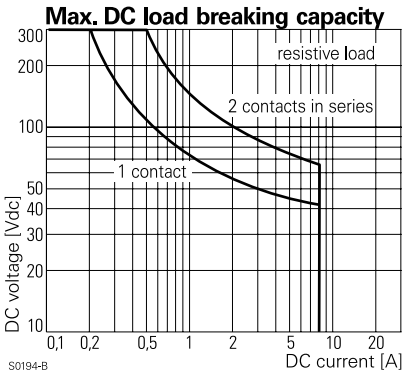
Applications

Domestic appliances, UPS's

Technical data of approved types on request

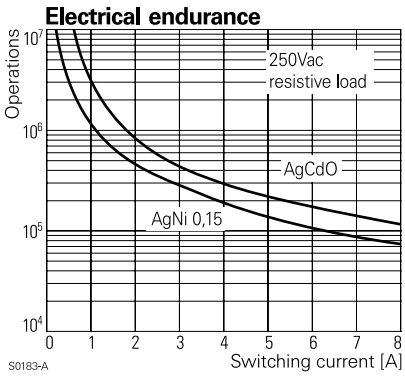
Contact data

Configuration	2 C/O contact or 2 N/O contact
Type of contact	single contact
Rated current	8 A (UL: 10 A)
Rated voltage / max.breaking voltage AC	250 Vac / 440 Vac
Maximum breaking capacity AC	2000 VA
Make current (max. 4 s at duty cycle 10%)	14 A
Contact material	Ag, AgCdO



Contact ratings

Type	Load	Operations	Standard
RP440	64 A ON, 2 A OFF, 250 Vac	$1x10^4$	VDE 0860
RP421	2 A, 50 Vdc, resistive	approx. $2x10^6$	
RP421	1/10hp, 240 Vac, per contact		UL 508
RP421	3 A, 380 Vac, AC11	approx. $3x10^4$	VDE 0660
RP421	0.18 A, 110 Vdc, DC11	approx. $1x10^5$	VDE 0660
RP420	0.6 A, 220 Vac, cosφ=0.8, single phase motor	approx. $1.3x10^6$	



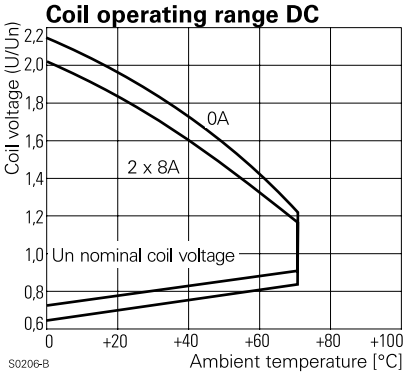
Coil data

Nominal voltage	5...110 Vdc
Nominal coil power	500 mW
Operate category	2 / b

Coil versions, DC-coil

Coil code	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Maximum voltage Vdc	Coil resistance Ω	Coil current mA
005	5	3.5	0.5	9.0	54±10%	92.6
006	6	4.2	0.6	10.8	68±10%	88.2
012	12	8.4	1.2	21.6	270±10%	44.4
024	24	16.8	2.4	43.2	1100±15%	21.8
048	48	33.6	4.8	86.4	4400±15%	10.9
060	60	42.0	6.0	108.0	6540±15%	9.2
110	110	77.0	11.0	198.0	23100±15%	4.8

All figures are given for coil without preenergization, at ambient temperature +20 °C
Other coil voltages on request



Power PCB Relay RP II/2

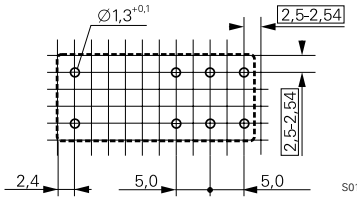
2 pole 8 A

Insulation		
Dielectric strength	coil-contacts	4000 V_{rms}
	open contact circuit	1000 V_{rms}
	adjacent contacts	2500 V_{rms}
Clearance / creepage		8 / 8 mm
Insulation to IEC 60664		
Voltage rating		250
Pollution degree		3
Overvoltage category		III
Insulation to VDE 0110b (2/79)		
Insulation category / reference voltage		C / 250

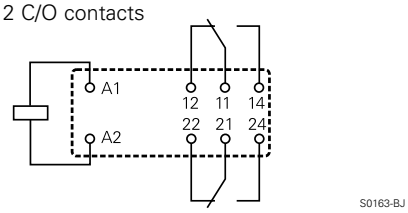
Other data	
Ambient temperature	-40...+70 °C
Mechanical life	20x10^6 operations
Max. switching rate at rated- / minimum load	10 min^{-1} / 1200 min^{-1}
Operate- / release time	typ. 9 / 3 ms
Bounce time N/O contact/N/C contact	typ. 2 / 3 ms
Vibration resistance N/O / N/C contact	11 / 1.5 g, 30...150 Hz
Shock resistance (destruction)	100 g
Category of protection (IEC 61810)	RT II - flux proof, RT III - wash tight
Relay weight	18 g
Packaging unit	20 / 500 pcs.
Accessories	see accessories RP

PCB layout / terminal assigment

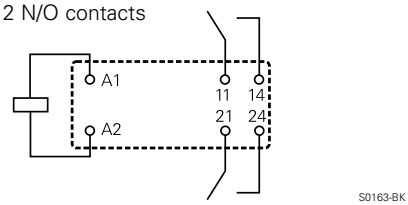
View on solder pins
Dimensions in mm



2 C/O contacts

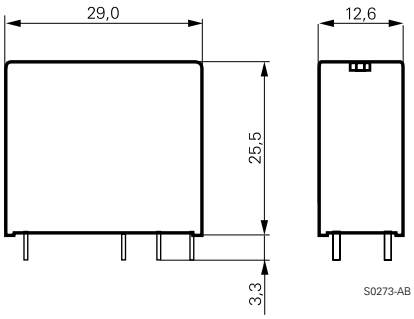


2 N/O contacts



Dimensions

Dimensions in mm



Product key

R P

Type

Version
- **5** **8A, flux proof**
- **8** 8A, wash tight

Contact
- **2** **2 C/O contacts**
- **4** 2 N/O contacts

Contact material
- **0** AgCdO
- **1** Ag
- **C** Ag, twin contacts, gold plated

Coil
Coil code: please refer to coil versions table

Preferred types in bold print

Miniature Power PCB Relay PB

1pole 10 A

F0224-A

Features

- 1 C/O or 1 N/O contact
- Environmentally-friendly cadmium-free contacts
- Creepage/clearance to VDE 0435 and VDE 0700
- Class F coil available
- Compact and simple design gives high process security

Applications

White goods, small home appliances, heating temperature controllers

VDE c UL us

Technical data of approvals on request

Contact data

Configuration	1 C/O contact or 1 N/O contact
Type of contact	single contact
Rated current	C/O version: N/O 10 A; N/C 3 A N/O version: 10 A
Continuous thermal load	10 A
Maximum switching voltage	250 Vac / 100 Vdc
Maximum breaking capacity AC	2500 VA
Make current (max. 4 s at duty cycle 10%)	15 A
Contact material	AgNi 90/10

Contact ratings

Type	Load	Operations
N/O contact	10 A, 85 °C	$25x10^3$
N/O contact	6 A, 85 °C	$100x10^3$
C/O contact	10 A / 3 A, 85 °C	$25x10^3$
C/O contact	10 A / 10 A, 85 °C	$1x10^3$

Coil data

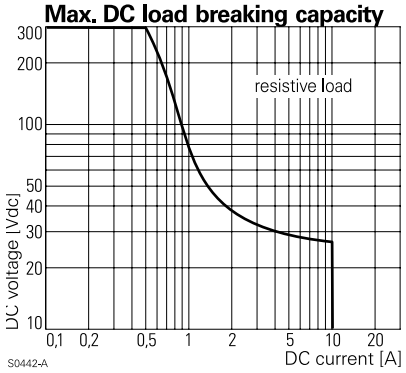
Nominal voltage	5, 6, 12, 24 Vdc
Nominal coil power	360 mW
Operate power	200 mW
Operate category	2 / c
Operate voltage max.	75 % U_{nom}
Non-release voltage	50 % U_{nom}
Release voltage min.	10 % U_{nom}

Coil versions, DC-coil

Coil code	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Coil resistance Ω	Coil current mA
005	5	3.75	0.5	70±10%	72.0
006	6	4.5	0.6	100±10%	60.0
009	9	6.75	0.9	225±10%	40.0
012	12	9	1.2	400±10%	30.0
024	24	18	2.4	1600±10%	15.0
036	36	27.0	3.6	3600±10%	10.0

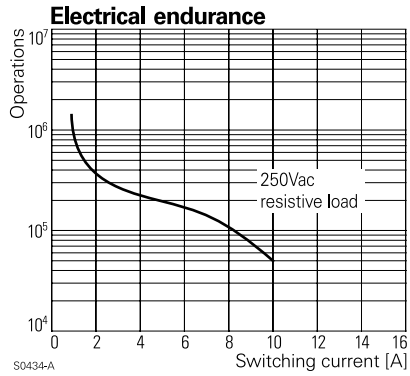
All figures are given for coil without preenergization, at ambient temperature +20 °C
Other coil voltages on request

Max. DC load breaking capacity



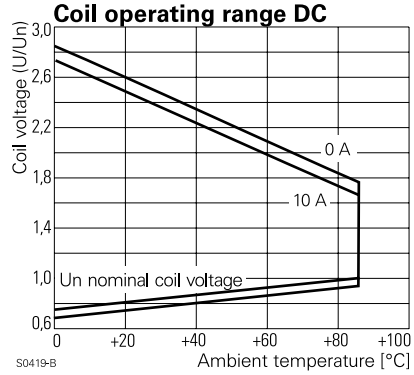
S0442-A

Electrical endurance



S0434-A

Coil operating range DC



S0419-B

Miniature Power PCB Relay PB

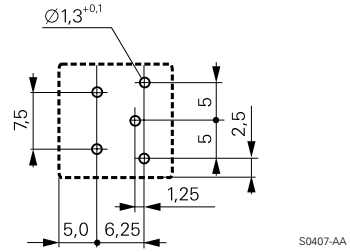
1pole 10 A

Insulation		
Dielectric strength	coil-contacts	2500 V_{rms}
	open contact circuit	1000 V_{rms}
Surge voltage resistance coil-contacts		4000 V_{rms}
Clearance / creepage		3 / 4 mm
Insulation to IEC 60664		
Voltage rating		250 V
Pollution degree		3
Overvoltage category		III
Insulation to VDE 0110b (2/79)		
Insulation category / reference voltage		C / 250
Insulation resistance		100x10^6
Tracking resistance of relay base		PB1...CTI 250 PB3...CTI 300

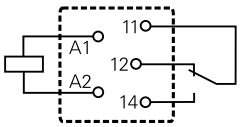
Other data	
Flammability class according to UL 94	V-0
Coil insulation system according to UL 1446	Class F
Ambient temperature	-20...+85 °C (105 °C)
Mechanical life	> 5x10^6 operations
Max. switching rate at rated- / minimum load	60 min^{-1} / 600 min^{-1}
Operate- / release time	< 20 ms
Bounce time	< 15 ms
Vibration resistance 30...400 Hz	>4 g
Shock resistance (destruction)	>30 g
Category of protection (IEC 61810)	RT II - flux proof
Relay weight	5.4 g
Soldering temperauture / time, IEC 68-2-20	max. 260 °C / 5s
Packaging unit	35 / 1050 pcs.

PCB layout / terminal assignment

View on solder pins
Dimensions in mm



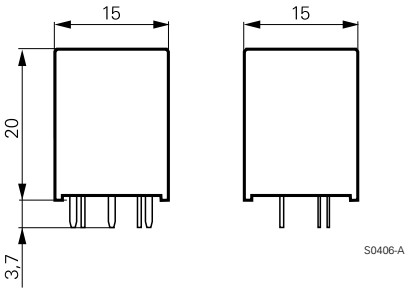
S0407-AA



S0407-AB

Dimensions

Dimensions in mm



S0406-A

Product key

P B ☐ ☐ 4 ☐ ☐ ☐

Type

Version
- **1** standard version, CTI 250
- **3** high CTI version, CTI 300

Contacts
- **1** 1 C/O contact
- **3** 1 N/O contact

Contact material
- **4** AgNi 90/10

Coil
- Coil code: please refer to coil versions table

Other types on request

Miniature Power PCB Relay ZN

1pole 10A

F0189-B

Features

- 1C/O or 1N/O contact
- Creepage/clearance to VDE 0435 and VDE 0700
- Sensitive 360mW coil available

Applications

Domestic appliances, heating control, building control, measurement & control

Technical data of approved types on request

Contact data

Configuration	1 C/O contact or 1 N/O contact
Type of contact	single contact
Rated current N/O contact / N/C contact	10 / 5 A
Continuous thermal load	10 A
Rated voltage / max.breaking voltage AC	250 Vac / 250 Vac
Maximum breaking capacity AC	2500 VA
Make current (max. 4 s at duty cycle 10%)	35 A
Contact material	AgCdO, AgSnO

Contact ratings

Type	Load	Operations
AgCdO	10 A, 240 Vac	$100x10^3$
AgCdO	5 A, 240 Vac, resistive	$2x10^5$
AgCdO	2 A, 120 Vac, cosφ=0.5, 60 °C	$1.4x10^6$

Coil data

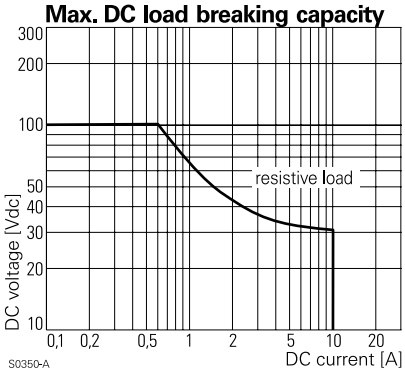
Coil data	T7N standard
Nominal voltage	6...48 Vdc
Nominal coil power	360 mW
Operate power	176 mW
Operate category	1 / c
Operate voltage max.	70 % U_{nom}
Non-release voltage	50 % U_{nom}
Release voltage min.	10 % U_{nom}

Coil versions

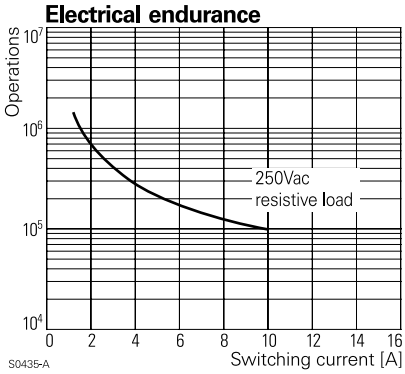
Coil code	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Maximum voltage Vdc	Coil resistance Ω	Coil current mA
06	6	4.2	0.6	12.5	100±10%	60.0
12	12	8.4	1.2	25.0	400±10%	30.0
24	24	16.8	2.4	50.0	1600±10%	15.0
36	36	25.2	3.6	73.0	3600±10%	10.0
48	48	33.6	4.8	100.0	6400±10%	7.0

All figures are given for coil without preenergization, at ambient temperature +20 °C
Other coil voltages on request

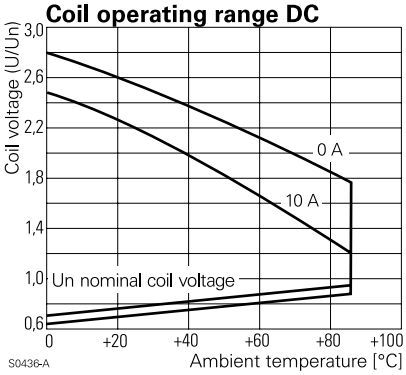
Max. DC load breaking capacity



Electrical endurance



Coil operating range DC



Miniature Power PCB Relay ZN

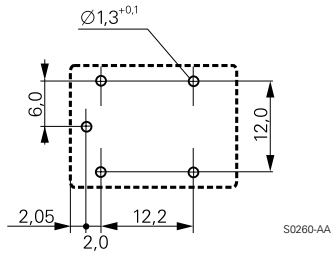
1pole 10A

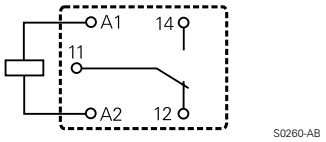
Insulation		
Dielectric strength	coil-contacts	2000 V_{rms}
	open contact circuit	1000 V_{rms}
Surge voltage resistance coil-contacts		4000 V_{rms} (1.2 / 50µs)
Clearance / creepage		2 / 3 mm
Insulation to IEC 60664		
Voltage rating		250 V
Pollution degree		3
Overvoltage category		III
Insulation to VDE 0110b (2/79)		
Insulation category / reference voltage		C / 250
Insulation resistance		100x10^6 Ω
Tracking resistance of relay base		CTI 225

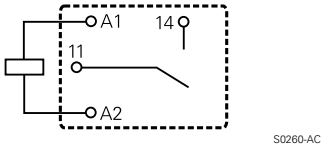
Other data	
Flammability class according to UL 94	V-0
Ambient temperature	-40...+85 °C (105 °C)
Mechanical life	10x10^6 operations
Max. switching rate at rated- / minimum load	30 min^{-1} / 300 min^{-1}
Operate- / release time	10 / 5 ms
Bounce time N/O contact / N/C contact	0.6 / 17 ms
Vibration resistance	>10 g
Shock resistance (function)	>10 g
Shock resistance (destruction)	>100 g
Category of protection (IEC 61810)	RT III - wash tight
Relay weight	11 g
Packaging unit	500 pcs.

PCB layout / terminal assignment

View on solder pins
Dimensions in mm

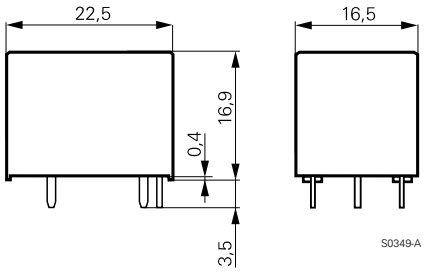






Dimensions

Dimensions in mm



Product key

Z	N	S					

Type

Version
S Standard, wash tight

Contacts
1 1 N/O contact **5** 1 C/O contact

Contact material
1 AgCdO **4** AgSnO

Coil
Coil code: please refer to coil versions table

Power Relay ZD

1 pole 30 A

F0156-A

F0179-A

Features

- 1 N/O or 1 C/O contact
- High breaking capacity 7500 VA
- PCB- and PCB/Faston connections
- Chassis mount version with faston terminals
- UL-class F as standard
- Ambient temperature 85 °C

Applications

HVAC, power supplies, domestic appliances, measurement & control

Technical data of approved types on request

Contact data

Configuration	1 C/O contact	1 N/O contact
Type of contact	single contact	
Rated current on the N/O- N/C contact	20 A / 10 A	25 A
Rated voltage / max.breaking voltage AC	240 Vac / 250 Vac	
Maximum breaking capacity AC	4800 VA	7200 VA
Contact material	AgCdO	
Minimum contact load	1 A, 5 Vdc / 12 Vac	

Contact ratings

Type	Load	Operations	Standard
N/O contact	2 hp, 240 Vac, motor	$6x10^3$	UL 508
N/O contact	5.4 A, 240 Vac, halogen	$6x10^3$	UL 508
N/O contact	25 A, 240 Vac, resistive	$1x10^5$	
C/O contact	10 / 10 A, 240 Vac, resistive	$1x10^5$	
C/O contact	20 / 10 A, 28 Vdc, resistive	$1x10^5$	

Coil data

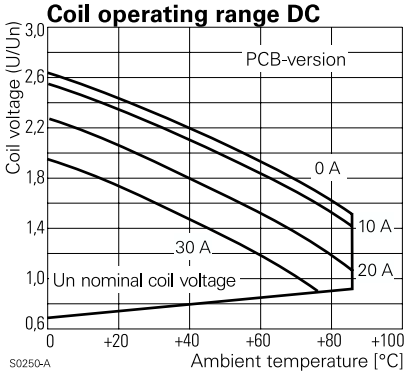
Nominal voltage	6...48 Vdc
Nominal coil power	1 W

Coil versions

Coil code	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Maximum voltage Vdc	Coil resistance Ω	Coil current mA
006	6	4.5	0.6	10.0	36±10%	166.7
012	12	9.0	1.2	20.1	144±10%	83.3
024	24	18.0	2.4	40.2	576±10%	41.7
048	48	36.0	4.8	80.3	2304±10%	20.8

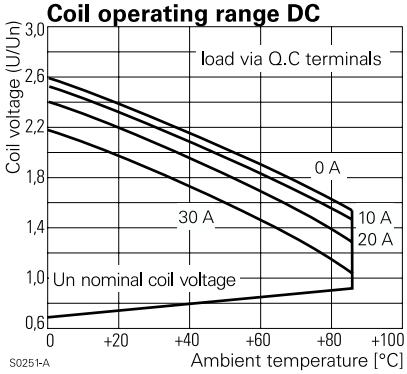
All figures are given for coil without preenergization, at ambient temperature +20 °C
Other coil voltages on request

Coil operating range DC



S0250-A

Coil operating range DC



S0251-A

Power Relay ZD

1 pole 30 A

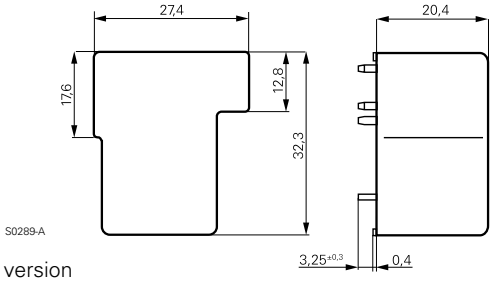
Insulation		
Dielectric strength	coil-contacts	2500 V_{rms}
	open contact circuit	1500 V_{rms}
Surge voltage resistance coil-contacts		6000 V_{rms}, 1.2/50 µs
Clearance / creepage		3.1 / 6.3 mm (UL508)

Other data	
Flammability class according to UL 94	V-0
Ambient temperature	-40...+85 °C
Mechanical life	$10x10^6$ operations
Vibration resistance	1.65 mm, 10...55 Hz
Shock resistance (function)	10 g at 11 ms half sine
Shock resistance (destruction)	100 g
Category of protection (IEC 61810)	RT III - wash tight
Relay weight	26 / 33 g
Packaging unit	250 pcs.

Dimensions

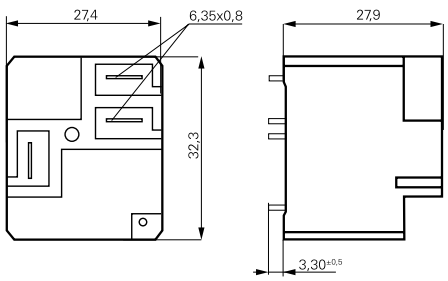
Dimensions in mm

PCB version



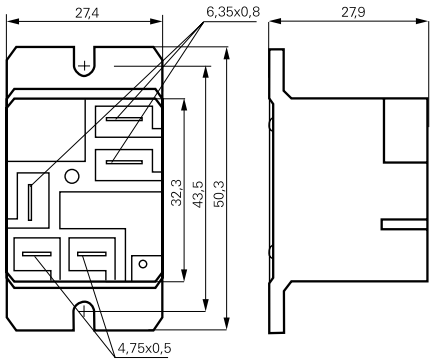
S0289-A

PCB-/Faston version



S0290-A

Flange mount

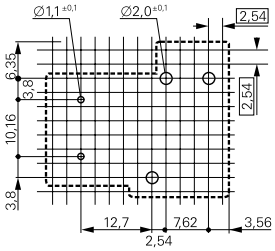


S0291-A

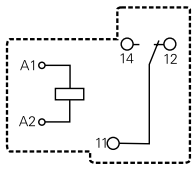
PCB layout / terminal assigment

View on solder pins
Dimensions in mm

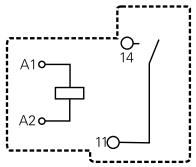
PCB version



S0261-AA

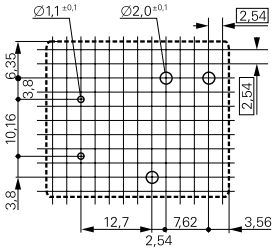


S0261-AB

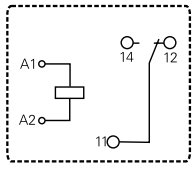


S0261-AC

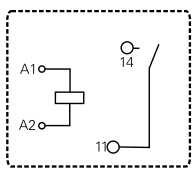
PCB-/Faston version



S0261-AH



S0261-AI



S0261-AJ

Power Relay ZD

1 pole 30 A

Product key

Z	D						

Type

Version
- **3** PCB wash tight
- **4** dust protected (flange mount)
- **5** PCB-/Faston-version, wash tight

Contacts
- **2** 1 N/O contact
- **1** 1 C/O contact

Contact material
- **2** AgCdO
- **4** AgSnO

Coil
- Coil code: please refer to coil versions table

Safety Relay SR2

2 pole 6 A

F0188-C

Features

- Forcibly guided contacts according to EN 50205
- 2 pole safety relay with either 1N/O+1N/C or 2C/O contacts
- 6 kV surge resistance between poles

Applications

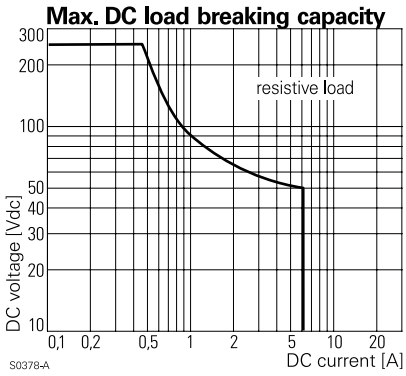
Emergency shut-off, machine control, elevator and escalator control, light barrier control

Technical data of approved types on request

Contact data

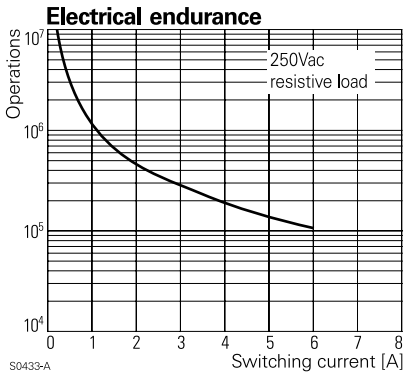
Configuration	1 N/C contact and 1 N/O contact or 2 C/O contact *)
Type of contact	single contact, forcibly guided
Rated current	6 A
Rated voltage / max.breaking voltage AC	250 Vac / 440 Vac
Maximum breaking capacity AC	1500 VA
Contact material	AgNi
Minimum contact load	> 50 mW
Contact resistance	≤ 100 mΩ / 1 A / 24 Vdc ≤ 2 Ω / 10 mA / 5 Vdc

*) According EN50205 only 1N/O / 1N / C i(11-14 and 22-21 or 12-11 and 21-24) shall be used as forcibly guided contacts.



Coil data

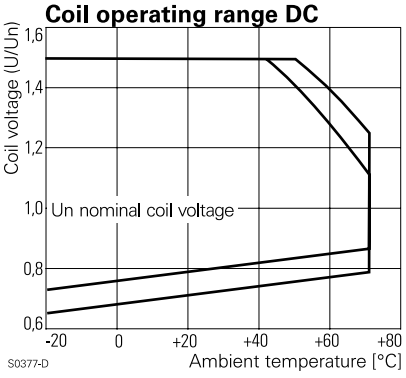
Nominal voltage	5...110 Vdc
Nominal coil power	approx. 700 mW
Operative range	2



Coil versions

Coil code	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Coil resistance Ω	Coil current mA
005	5	3.8	0.5	35.7±10%	140.0
006	6	4.5	0.6	51±10%	117.6
009	9	6.75	0.9	116±10%	77.6
012	12	9.0	1.2	206±10%	58.3
018	18	13.5	1.8	483±10%	37.3
021	21	15.8	2.1	630±10%	33.3
024	24	18.0	2.4	823±10%	29.2
036	36	27.0	3.6	1851±10%	19.4
040	40	30.0	4.0	2286±10%	17.5
048	48	36.0	4.8	3291±12%	14.6
060	60	45.0	6.0	5142±12%	11.7
080	80	60.0	8.0	9143±12%	8.7
110	110	82.5	11.0	17285±12%	6.4

All figures are given for coil without preenergization, at ambient temperature +20 °C
$U_{op\ max}$: at 70 °C after preenergization with 1.1 x U_{nom} the max. operate voltage is 85% of U_{nom}. U_{max}: at 70 °C the max. coil voltage is 1.1 x U_{nom}
Other coil voltages on request



Safety Relay SR2

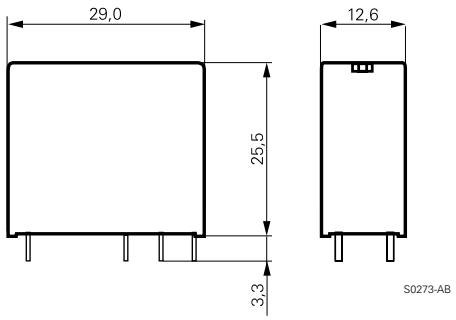
2 pole 6 A

Insulation		
Dielectric strength	coil-contacts	4000 V_{rms}
	open contact circuit	1000 V_{rms}
	adjacent contacts	3000 V_{rms}
Clearance / creepage	coil-contacts	8 / 8 mm
	adjacent contacts	5.5 / 5.5 mm
Insulation to IEC 60664		
Voltage rating		250 V
Pollution degree		2
Overvoltage category		III
Insulation resistance (500 Vdc)		> 1x10^6 Ω
Tracking resistance of relay base		CTI 250

Other data	
Ambient temperature	-25...+70 °C
Mechanical life	10x10^6 operations
Max. switching rate at rated- / minimum load	6 min^{-1} / 300 min^{-1}
Operate- / release time	typ. 10 / 4 ms
Vibration resistance N/O / N/C contact	> 10 / 2.5 g, 15...200 Hz
Shock resistance (function)N/O contact / N/C contact	> 10 / 5 g, 11 ms half sine
Category of protection (IEC 61810)	RT III - wash tight
Relay weight	20 g
Packaging unit	20 pcs.
Accessories	see accessories SR2

Dimensions

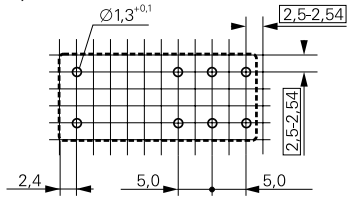
Dimensions in mm

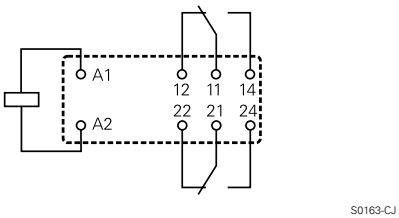


PCB layout / terminal assigment

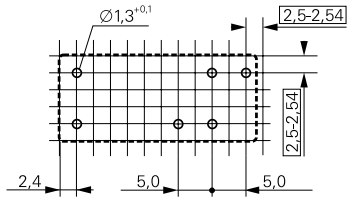
View on solder pins
Dimensions in mm

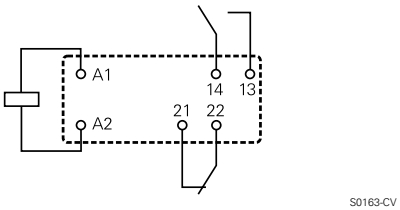
2 C/O contacts





1 N/O and 1 N/C contacts





Product key

S R 2 | | | | | |

Type
Safety Relay, wash tight

Version
X 1 N/O contact
Y 1 C/O contact

Contact material
5 AgNi

Coil
Coil code: please refer to coil versions table

Safety Relay SR4

4 pole 8 A

F0244-A

Features

- Forcibly guided contacts according to EN 50205
- 4 pole safety relay with either
  2 N/O+2 N/C or 3 N/O+1 N/C contacts
- Very small outlines

Applications

Emergency shut-off, machine control, elevator and escalator control, light barrier control

VDE c UL us

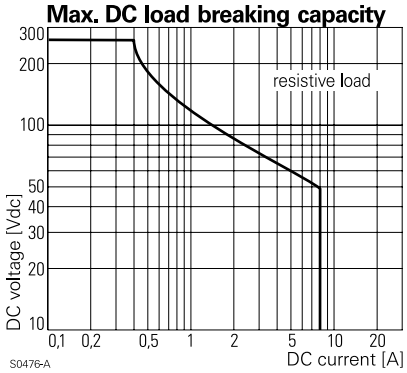
Technical data of approved types on request

in preparation

Contact data

Configuration	3 N/O contact and 1 N/C contact or 2 N/O contact and 2 N/C contact
Type of contact	single contact, forcibly guided
Continuous thermal load	8 A
Rated voltage / max.breaking voltage AC	250 Vac / 440 Vac
Maximum breaking capacity AC	2000 VA
Contact material	AgSnO
Minimum contact load	> 50 mW
Contact resistance	≤100 mΩ / 1 A / 24 Vdc ≤20 Ω / 10 mA / 5 Vdc

Max. DC load breaking capacity



S0476-A

Coil data

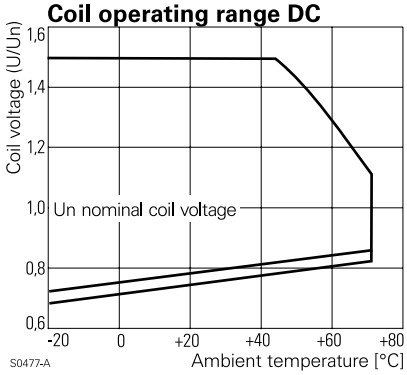
Nominal voltage	5...110 Vdc
Nominal coil power	800 mW
Operative range	2

Coil versions

Coil code	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Coil resistance Ω	Coil current mA
005	5	3.8	0.5	31±10%	161.3
006	6	4.5	0.6	45±10%	133.3
009	9	6.8	0.9	101±10%	89.1
012	12	9.0	1.2	180±10%	66.7
015	15	11.3	1.5	281±10%	53.4
018	18	13.5	1.8	405±10%	44.4
021	21	15.8	2.1	551±10%	38.1
024	24	18.0	2.4	720±10%	33.3
036	36	27.0	3.6	1620±10%	22.2
040	40	30.0	4.0	2000±10%	20.0
048	48	36.0	4.8	2880±10%	16.7
060	60	45.0	6.0	4500±10%	13.3
085	85	63.8	8.5	9031±10%	9.4
110	110	82.5	11.0	15125±10%	7.3

All figures are given for coil without preenergization, at ambient temperature +20 °C
$U_{op\ max}$: at 70 °C after preenergization with 1.1 x U_{nom} the max. operate voltage is 85% of U_{nom}. U_{max}: at 70 °C the max. coil voltage is 1.1 x U_{nom}
Other coil voltages on request

Coil operating range DC



S0477-A

Safety Relay SR4

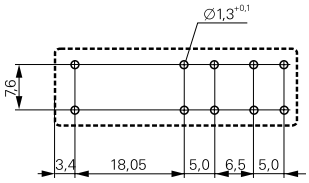
4 pole 8 A

Insulation		
Dielectric strength	coil-contacts	4000 V_{rms}
	open contact circuit	1000 V_{rms}
	adjacent contacts	2500 V_{rms}
Clearance / creepage coil-contact		10 / 10 mm
adjacent contacts		3 / 3.5 mm
Insulation to IEC 60664		
Voltage rating		250 V
Pollution degree		2
Overvoltage category		III
Insulation resistance (500 Vdc)		> 1x10^6 Ω
Tracking resistance of relay base		CTI 250

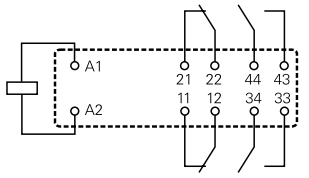
Other data	
Ambient temperature	-25...+70 °C
Mechanical life	≥ 10x10^6 operations
Max. switching rate at rated- / minimum load	6 min^{-1} / 300 min^{-1}
Operate- / release time	typ. 12 / 20 ms
Vibration resistance N/O / N/C contact	> 8 / 2.5 g, 10...200 Hz
Category of protection (IEC 61810)	RT III - wash tight
Relay weight	16 g
Packaging unit	10 pcs.

PCB layout / terminal assigment

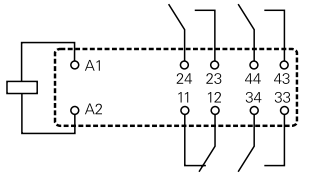
View on solder pins
Dimensions in mm



2 N/O and 2 N/C contacts

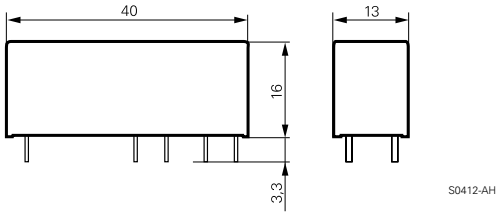


3 N/O and 1 N/C contacts



Dimensions

Dimensions in mm



Product key

S	R	4		4			

Type

Contact configuration
- **D** 2 N/O + 2 N/C contacts
- **M** 3 N/O + 1 N/C contacts

Contact material
- **4** AgSnO

Coil
- Coil code: please refer to coil versions table

Other types on request

Safety Relay SR6 D/M

4 pole 8 A

F0245-A

Features

- Forcibly guided contacts according to EN 50205
- 4 pole safety relay with either 2 N/O+2 N/C or 3 N/O+1 N/C
- High insulation distances for safe separation of electrical circuits

Applications

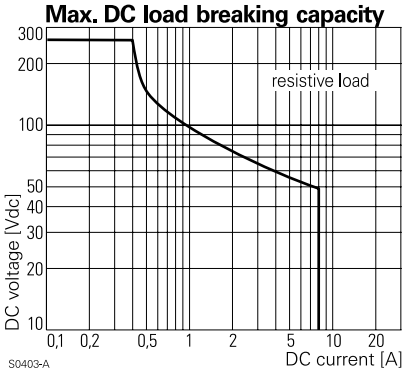
Emergency shut-off, press control, machine control, elevator and escalator control, safety modules

Technical data of approved types on request

Contact data

Configuration	3 N/O contact and 1 N/C contact or 2 N/O contact and 2 N/C contact
Type of contact	single contact, forcibly guided
Continuous thermal load	8 A
Rated voltage / max.breaking voltage AC	250 Vac / 440 Vac
Maximum breaking capacity AC	2000 VA
Contact material	AgSnO
Minimum contact load	> 50 mW
Contact resistance	≤100 mΩ / 1 A / 24 Vdc ≤20 Ω / 10 mA / 5 Vdc

Max. DC load breaking capacity



S0403-A

Coil data

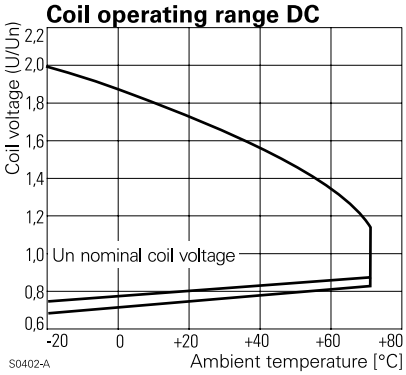
Nominal voltage	5...110 Vdc
Nominal coil power	1200 mW
Operative range	2

Coil versions

Coil code	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Coil resistance Ω	Coil current mA
005	5	3.8	0.5	21±10%	238.1
006	6	4.5	0.6	30±10%	200.0
009	9	6.8	0.9	68±10%	132.4
012	12	9.0	1.2	120±10%	100.0
018	18	13.5	1.8	270±10%	66.7
021	21	15.8	2.1	368±10%	57.1
024	24	18.0	2.4	480±10%	50.0
036	36	27.0	3.6	1080±10%	33.3
040	40	30.0	4.0	1333±10%	30.0
048	48	36.0	4.8	1920±10%	25.0
060	60	45.0	6.0	3000±12%	20.0
085	85	64.0	8.5	6021±12%	14.1
110	110	82.5	11.0	10080±12%	10.9

All figures are given for coil without preenergization, at ambient temperature +20 °C
$U_{op\ max}$: at 70 °C after preenergization with 1.1 x U_{nom} the max. operate voltage is 85% of U_{nom}
U_{max}: at 70 °C the max. coil voltage is 1.1 x U_{nom}
Other coil voltages on request

Coil operating range DC



S0402-A

Safety Relay SR6 D/M

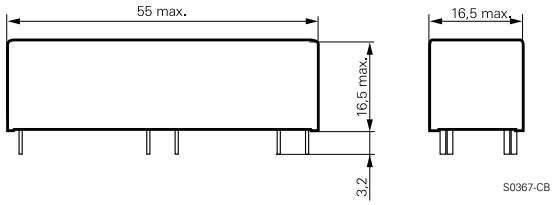
4 pole 8 A

Insulation		
Dielectric strength	coil-contacts	3000 V_{rms}
	open contact circuit	1000 V_{rms}
	adjacent contacts	3000 V_{rms} / 4000 V_{rms} *)
Clearance / creepage coil-contact		5.5 / 5.5 mm
adjacent contacts		5.5 / 5.5 mm or 12 / 12 mm *)
Insulation to IEC 60664		
Voltage rating		250 V
Pollution degree		2
Overvoltage category		III
Insulation resistance (500 Vdc)		> 1x10^6 Ω
Tracking resistance of relay base		CTI 250
*) in longitudinal direction		

Other data	
Ambient temperature	-25...+70 °C
Mechanical life	≥ 10x10^6 operations
Max. switching rate at rated- / minimum load	6 min^{-1} / 300 min^{-1}
Operate- / release time	typ. 11 / 3 ms
Vibration resistance N/O / N/C contact	> 8 / 5 g, 10...200 Hz
Shock resistance (function) N/O contact / N/C contact	> 8 / 6 g, 16ms half sine
Category of protection (IEC 61810)	RT III - wash tight
Relay weight	30 g
Packaging unit	10 pcs.

Dimensions

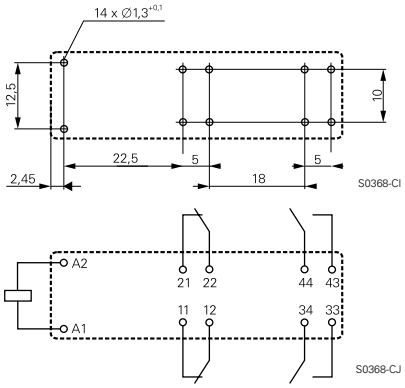
Dimensions in mm



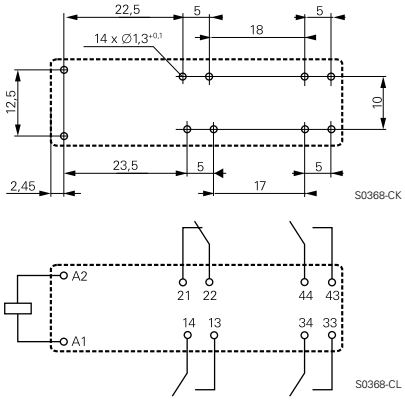
PCB layout / terminal assignment

View on solder pins
Dimensions in mm

2 N/O+2 N/C versions



3 N/O + 1 N/C version



Product key

S	R	6		4			

Type

Contact configuration
- **D** 2 N/O + 2 N/C contacts
- **M** 3 N/O + 1 N/C contacts

Contact material
- **4** AgSnO

Coil
- Coil code: please refer to coil versions table

Other types on request

Safety Relay SR6

6 pole 8 A

F0206-B

Features

- Forcibly guided contacts according to EN50205
- Small 6 pole safety relay with either
  4 N/O+2 N/C or 3 N/O+3 N/C or 5 N/O+1 N/C contacts
- 6 kV surge resistance between poles

Applications

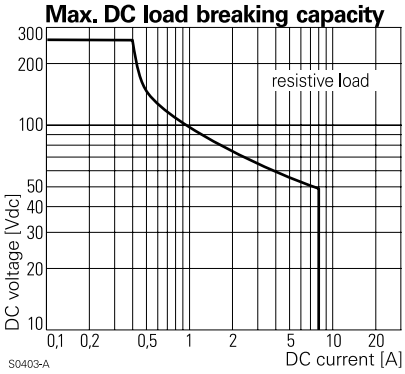
Emergency shut-off, press control, machine control, elevator and escalator control, safety modules

Technical data of approved types on request

Contact data

Configuration	3 N/O contact and 3 N/C contact or 4 N/O contact and 2 N/C contact or 5 N/O contact and 1 N/C contact
Type of contact	single contact, forcibly guided
Continuous thermal load	8 A
Rated voltage / max.breaking voltage AC	250 Vac / 440 Vac
Maximum breaking capacity AC	2000 VA
Contact material	AgSnO
Minimum contact load	> 50 mW
Contact resistance	≤100 mΩ / 1 A / 24 Vdc ≤20 Ω / 10 mA / 5 Vdc

Max. DC load breaking capacity



S0403-A

Coil data

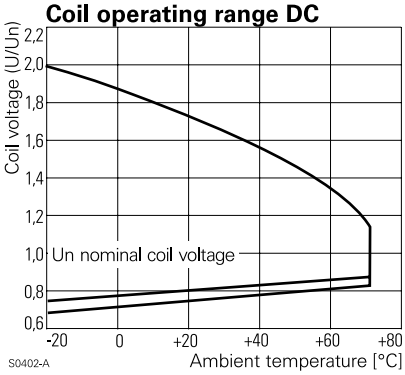
Nominal voltage	5...110 Vdc
Nominal coil power	1200 mW
Operative range	2

Coil versions

Coil code	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Coil resistance Ω	Coil current mA
005	5	3.8	0.5	21±10%	238.1
006	6	4.5	0.6	30±10%	200.0
009	9	6.8	0.9	68±10%	132.4
012	12	9.0	1.2	120±10%	100.0
018	18	13.5	1.8	270±10%	66.7
021	21	15.8	2.1	368±10%	57.1
024	24	18.0	2.4	480±10%	50.0
036	36	27.0	3.6	1080±10%	33.3
040	40	30.0	4.0	1333±10%	30.0
048	48	36.0	4.8	1920±10%	25.0
060	60	45.0	6.0	3000±12%	20.0
085	85	64.0	8.5	6021±12%	14.1
110	110	82.5	11.0	10080±12%	10.9

All figures are given for coil without preenergization, at ambient temperature +20 °C
$U_{op\ max}$: at 70 °C after preenergization with 1.1 x U_{nom} the max. operate voltage is 85% of U_{nom}. U_{max}: at 70 °C the max. coil voltage is 1.1 x U_{nom}
Other coil voltages on request

Coil operating range DC



S0402-A

Safety Relay SR6

6 pole 8 A

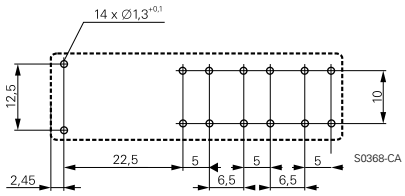
Insulation		
Dielectric strength	coil-contacts	3000 V_{rms}
	open contact circuit	1000 V_{rms}
	adjacent contacts	3000 V_{rms}
Clearance / creepage coil-contact		5.5 / 5,5 mm
adjacent contacts		5.5 / 5.5 mm
Insulation to IEC 60664		
Voltage rating		250 V
Pollution degree		2
Overvoltage category		III
Insulation resistance (500 Vdc)		> $1x10^6$ Ω
Tracking resistance of relay base		CTI 250

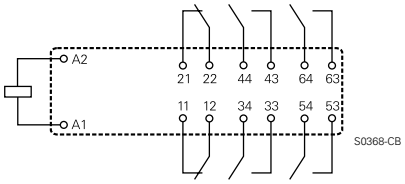
Other data	
Ambient temperature	-25...+70 °C
Mechanical life	≥ $10x10^6$ operations
Max. switching rate at rated- / minimum load	6 min^{-1} / 300 min^{-1}
Operate- / release time	typ. 11 / 3 ms
Vibration resistance N/O / N/C contact	> 8 / 5 g, 10...200 Hz
Shock resistance (function) N/O contact / N/C contact	> 8 / 6 g, 16ms half sine
Category of protection (IEC 61810)	RT III - wash tight
Relay weight	30 g
Packaging unit	10 pcs.

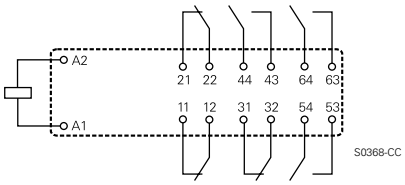
PCB layout / terminal assignment

View on solder pins
Dimensions in mm

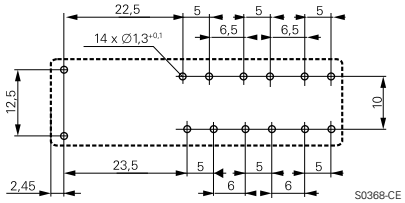
4 N/O+2 N/C and 3 N/O+3 N/C versions

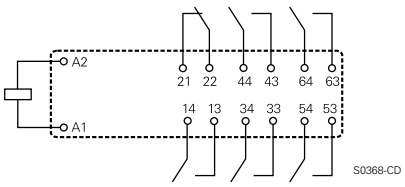






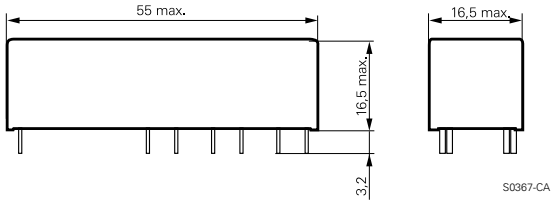
5 N/O + 1 N/C version





Dimensions

Dimensions in mm



Product key

S	R	6					

Type
Safety Relay, wash tight

Version
A 3 N/O contact and 3 N/C contacts
B 4 N/O contact and 2 N/C contacts
C 5 N/O contact and 1 N/C contacts

Contact material
4 AgSnO

Coil
Coil code: please refer to coil versions table

Safety Relay SR6 sensitive

6 pole 8 A

F0206-B

Features

- Forcibly guided contacts according to EN50205
- polarized, monostable with 800 mW coil power consumption
- Smallest 6 pole safety relay with either
  4 N/O+2 N/C or 3 N/O+3 N/C or 5 N/O+1 N/C contacts
- 6 kV surge resistance between poles

Applications

Emergency shut-off, press control, machine control, elevator and escalator control, safety modules

VDE

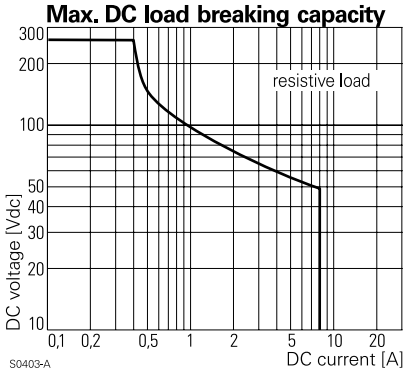
Technical data of approved types on request

in preperation cULus

Contact data

Configuration	3 N/O contact and 3 N/C contact or 4 N/O contact and 2 N/C contact or 5 N/O contact and 1 N/C contact
Type of contact	single contact, forcibly guided
Continuous thermal load	8 A
Rated voltage / max.breaking voltage AC	250 Vac / 440 Vac
Maximum breaking capacity AC	2000 VA
Contact material	AgSnO
Minimum contact load	> 50 mW
Contact resistance	≤100 mΩ / 1 A / 24 Vdc ≤20 Ω / 10 mA / 5 Vdc

Max. DC load breaking capacity



S0403-A

Coil data

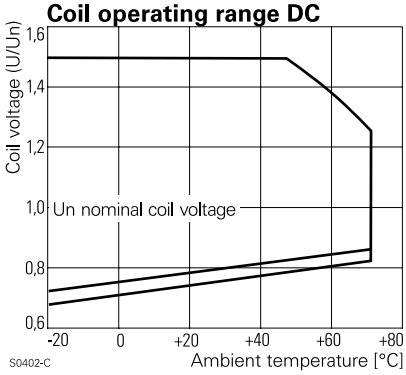
Nominal voltage	5...48 Vdc
Nominal coil power	800 mW
Operative range	2

Coil versions

Coil code	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Coil resistance Ω	Coil current mA
05	5	3.8	0.5	31±10%	161.3
06	6	4.5	0.6	45±10%	133.3
09	9	6.8	0.9	101±10%	89.1
12	12	9.0	1.2	180±10%	66.7
15	15	11.3	1.5	281±10%	53.4
18	18	13.5	1.8	405±10%	44.4
21	21	15.8	2.1	551±10%	38.1
24	24	18.0	2.4	720±10%	33.3
36	36	27.0	3.6	1620±10%	22.2
40	40	30.0	4.0	2000±10%	20.0
48	48	36.0	4.8	2880±10%	16.7

All figures are given for coil without preenergization, at ambient temperature +20 °C
$U_{op\ max}$: at 70 °C after preenergization with 1.1 x U_{nom} the max. operate voltage is 85% of U_{nom}. U_{max}: at 70 °C the max. coil voltage is 1.1 x U_{nom}
Other coil voltages on request

Coil operating range DC



S0402-C

Safety Relay SR6 sensitive

6 pole 8 A

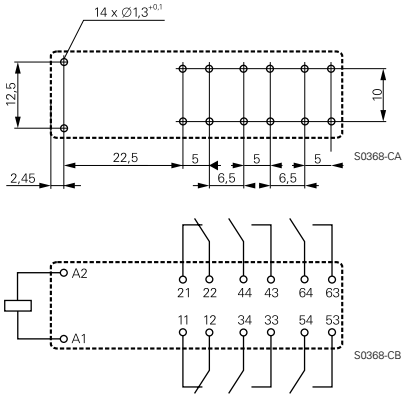
Insulation		
Dielectric strength	coil-contacts	3000 V_{rms}
	open contact circuit	1000 V_{rms}
	adjacent contacts	3000 V_{rms}
Clearance / creepage coil-contact		5.5 mm
adjacent contacts		5.5 mm
Insulation to IEC 60664		
Voltage rating		250 V
Pollution degree		2
Overvoltage category		III
Insulation resistance (500 Vdc)		> $1x10^6$ Ω
Tracking resistance of relay base		CTI 250

Other data	
Ambient temperature	-25...+70 °C
Mechanical life	≥ $10x10^6$ operations
Max. switching rate at rated- / minimum load	6 min^{-1} / 300 min^{-1}
Operate- / release time	typ. 11 / 3 ms
Vibration resistance N/O / N/C contact	> 8 / 5 g, 10...200 Hz
Shock resistance (function) N/O contact / N/C contact	> 8 / 6 g, 16ms half sine
Category of protection (IEC 61810)	RT III - wash tight
Relay weight	30 g
Packaging unit	10 pcs.

PCB layout / terminal assignment

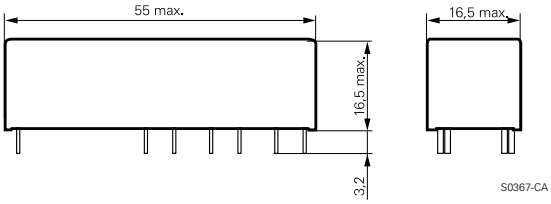
View on solder pins
Dimensions in mm

4 N/O+2 N/C and 3 N/O+3 N/C versions



Dimensions

Dimensions in mm



Release condition corresponds to the position shown. With positive potential on terminal A1 the relay changes to its operate position

Product key

S	R	6	B	4	S		

Type

Contact configuration
B 4 N/O and 2 N/C

Kontaktwerkstoff
4 AgSnO

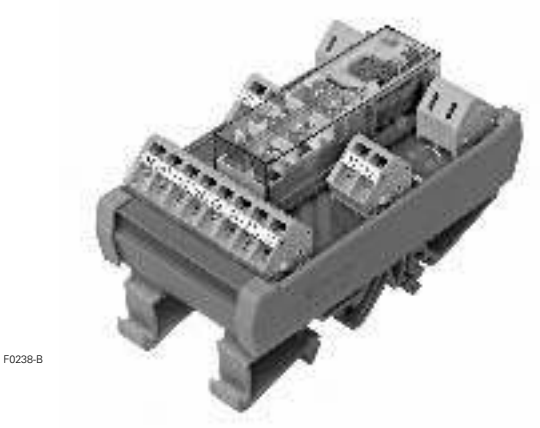
Coil
S sensitive coil

Coil
Coil code: please refer to coil versions table

other types on request

Safety Relay on DIN-rail SR6 Z

6 pole 8 A



F0238-B

Features

- SR6 on printed circuit board
- AC/DC input
- Spring connectors
- Module width 46 mm

Applications

Elevator control, machine control

CE

Technical data of approved types on request

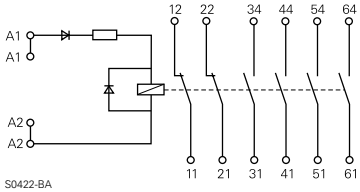
Contact data	
Type of contact	single contact, forcibly guided
Maximum switching current / continuous thermal load	8 A
Maximum switching voltage	250 Vac / Vdc
Maximum breaking capacity AC	2000 VA
Contact material	AgSnO
Minimum contact load	> 50 mW
Contact resistance	≤100 mΩ / 1 A / 24 Vdc ≤20 Ω / 10 mA / 5 Vdc

Coil data	
DC energizing voltage Unom	6, 12, 18, 21, 24, 36, 40, 48, 60, 115 Vdc
AC/DC energizing voltage Unom	12, 21, 24, 40, 48, 60,115 Vac/Vdc
AC energizing voltage Unom	230 Vac
Input circuit	bridge rectifier, series resistor
Minimum operate voltage	90% of Unom
Minimum release voltage (+23°C)	≤10% of Unom
Maximum permissible operating voltage	110% of Unom

Insulation		
Surge voltage resistance	coil-contacts	3000 V_{rms}
	open contact circuit	1000 V_{rms}
	adjacent contacts	2000 V_{rms}
Clearance / creepage	coil-contact	5.5 / 5.5 mm
	adjacent contacts	3 / 3 mm
Insulation to IEC 60664		
Voltage rating		250 V
Pollution degree		2
Overvoltage category		III

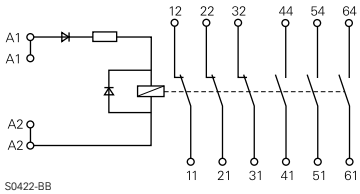
Terminal assignment

DC module, 4 N/O+2 N/C version



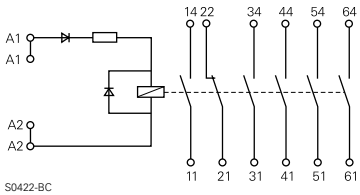
S0422-BA

DC module, 3 N/O+3 N/C version



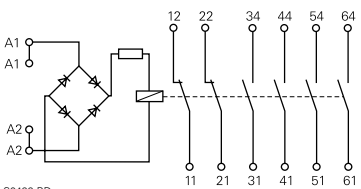
S0422-BB

DC module, 5 N/O+1 N/C version



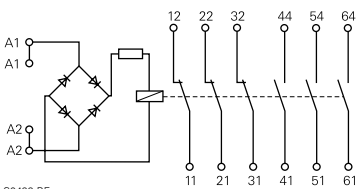
S0422-BC

AC/DC module, 4 N/O+2 N/C version



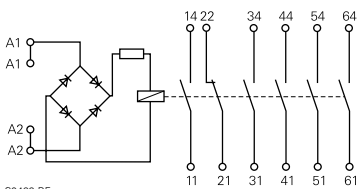
S0422-BD

AC/DC module, 3 N/O+3 N/C version



S0422-BE

AC/DC module, 5 N/O+1 N/C version



S0422-BF

Safety Relay on DIN-rail SR6 Z

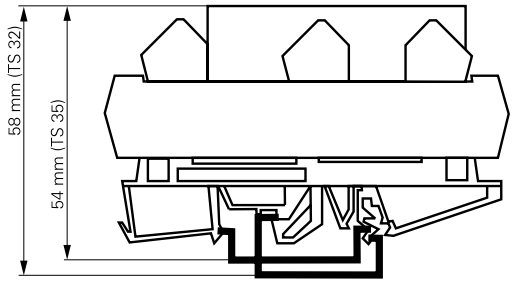
6 pole 8 A

Other data	
Flammability class according to UL 94	
housing	V2
housing cage clamp terminals	V0
PCB	V0
relay base	V0
relay cover	V2
Ambient temperature	-25...+50 °C
Mechanical life	≥ 10x10^6 operations
Max. switching rate at rated- / minimum load	6 min^{-1} / 300 min^{-1}
Connections (according IEC)	
solid wire	0.2...2.5 mm^2
stranded wire	0.2...2.5 mm^2
AWG	28...14
Installation position	any
Mounting	in rows with zero spacing
Type of connection	spring clamp connection
Relay weight	90 g
Packaging unit	2 pcs.

Dimensions

Dimensions in mm

Module width 46 mm
Module length 87 mm



S0423-AA

Fit onto mounting rails according to DIN EN 50022 or DIN EN 50035

Product key

S	R	6	Z				

Type

Contact configuration
- **A** 3 N/O + 3 N/C contacts
- **B** 4 N/O + 2 N/C contacts
- **C** 5 N/O + 1 N/C contacts

Coil

DC coil code = nominal voltage (e.g. 024=24Vdc)
AC/DC coil code: 524=24Vac/dc, 615=115Vac/dc
AC coil code: 730=230Vac
coil code: please refer to coil versions table

Other types on request

Miniature Relay PT

2 pole 12 A, 3 pole 10 A or 4 pole 6 A
DC- or AC-coil

F0191-A

Features

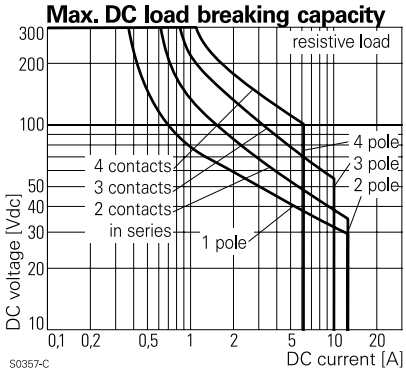
- 2, 3 or 4 C/O contacts
- Switching performance up to 3000 VA
- Relay height 29 mm
- Cadmium-free contact material
- Mechanical and electrical indicator
- Manual test tab, optionally lockable.
- White marking tabs

Applications

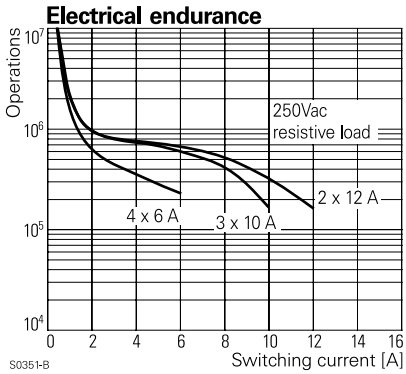
Universal use in control and automation

Technical data of approved types on request

Contact data	PT2	PT3	PT5
Configuration	2 C/O	3 C/O	4 C/O
Type of contact	single contacts		
Rated current	12 A	10 A	6 A
Rated voltage / max.breaking voltage AC	250 Vac	250 Vac	250 Vac
Maximum switching voltage	440 Vac	440 Vac	250 Vac
Maximum breaking capacity AC	3000 VA	2500 VA	1500 VA
Make current	24 A	20 A	12 A
Contact material	AgNi 90/10, AgNi 90/10 gold plated		
Minimum contact load	24 V, 10 mA / 20 mV, 1 mA gold plated		



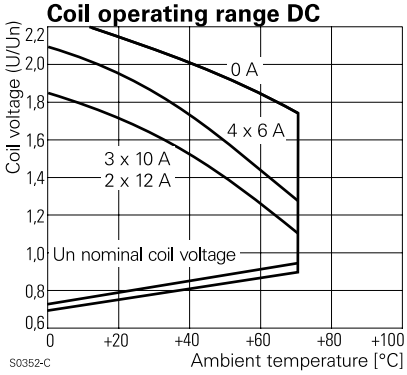
Contact ratings			
Type	Load	Operations	Standard
PT570	6 A, 250 Vac, on the C/O contact	$1x10^5$	VDE 0435



Coil data		
Nominal voltage	DC coil	6...220 Vdc
	AC coil	6...230 Vac
Nominal coil power	DC coil	typ. 0.75 W
	AC coil	typ. 1.0 VA
Operate category		2 / b
Operating range for AC coil 60Hz at 70 °C		90...110% U_{nom}

Coil versions, DC-coil						
Coil code Standard	LED bipolar	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Coil resistance Ω	Coil current mA
006	L06	6	4.5	0.6	48±10%	125.0
012	L12	12	9.0	1.2	192±10%	62.5
024	**L24**	**24**	**18.0**	**2.4**	**777±10%**	**31.3**
048	L48	48	36.0	4.8	3072±10%	15.6
060	L60	60	45.0	6.0	4845±12%	12.5
110	M10	110	82.5	11.0	16133±15%	6.8
220	N20	220	165.0	22.0	64533±15%	3.4

All figures are given for coil without preenergization, at ambient temperature +20 °C



Miniature Relay PT

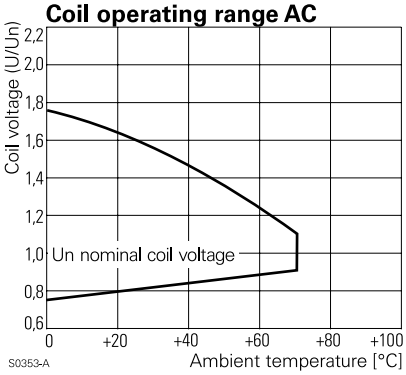
2 pole 12 A, 3 pole 10 A or 4 pole 6 A
DC- or AC-coil

Coil versions, AC-coil

Coil code Standard	LED	Nominal voltage Vac	Pull-in voltage Vac	Release voltage Vac	Coil resistance Ω	Coil current mA
506	R06	6	4.8	1.8	11±10%	166.5
512	R12	12	9.6	3.6	48±10%	83.3
524	**R24**	**24**	**19.2**	**7.2**	**192±10%**	**41.6**
548	R48	48	38.4	14.4	777±10%	21.3
560	R60	60	48.0	18.0	1306±10%	16.7
615	S15	115	92.0	34.5	4845±12%	8.8
730	**T30**	**230**	**184.0**	**69.0**	**19465±15%**	**4.3**

All figures are given for coil without preenergization, at ambient temperature +20 °C

Coil operating range AC



Insulation	PT2	PT3	PT5
Dielectric strength coil-contacts	2500 V_{rms}	2500 V_{rms}	2500 V_{rms}
open contact circuit in unenergized position typ.	1500 V_{rms}	1500 V_{rms}	1500 V_{rms}
adjacent contacts	2500 V_{rms}	2500 V_{rms}	2000 V_{rms}
Clearance / creepage	3 / 4 mm	2.6 / 4 mm	1.8 / 3 mm
Insulation to IEC 60664			
Voltage rating	240 V	240 V	240 V
Pollution degree	3	3	2
Overvoltage category	III	III	III
Insulation to VDE 0110b (2/79)			
Insulation category / ref. voltage	C / 250	C / 250	B / 250
Tracking resistance of relay base		CTI 175	

Other data

Flammability class according to UL 94		V-0
Ambient temperature	DC-coil	-40...+70 °C
	AC-coil	-40...+70 °C
Mechanical life	DC-coil	>30x10^6 ops.
	AC-coil	>20x10^6 ops.
Max. switching rate at rated- / minimum load		6 min^{-1} / 600 min^{-1}
Operate- / release time		15 / 10 ms
Bounce time		5 ms
Vibration resistance N/O contact/N/C contact		>7 / 4 g
Shock resistance (function) N/O contact/N/C contact		>20 / 5 g
Category of protection (IEC 61810)		RT II - flux proof
Relay weight		30 g
Packaging unit		10 pcs.
Accessories		see accessories PT

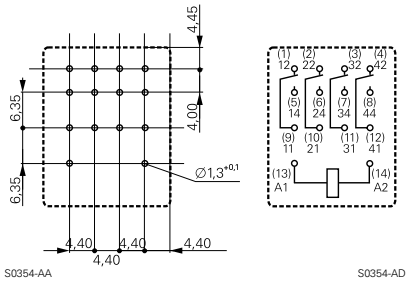
Miniature Relay PT

2 pole 12 A, 3 pole 10 A or 4 pole 6 A
DC- or AC-coil

PCB layout / terminal assignment

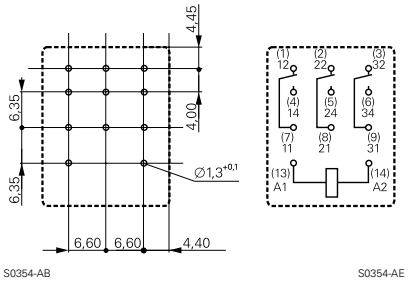
View on solder pins
Dimensions in mm

4-pole



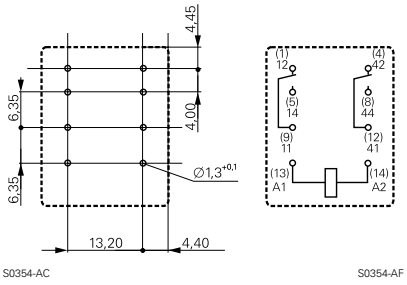
S0354-AA S0354-AD

3-pole



S0354-AB S0354-AE

2-pole

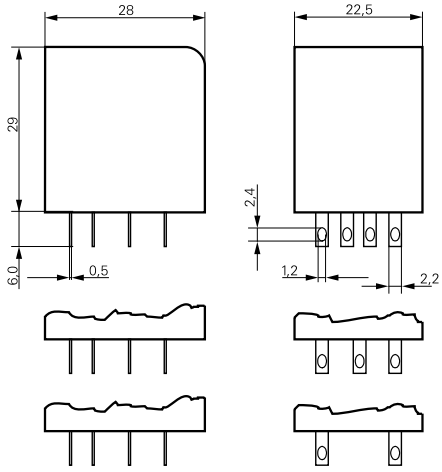


S0354-AC S0354-AF

Dimensions

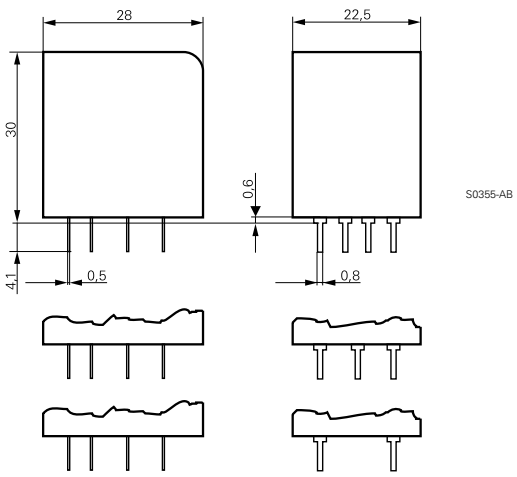
Dimensions in mm

Solder- and plug-in terminals (standard version)



S0355-AA

PCB version



S0355-AB

Product key

P	T						

Type

Contact configuration
- **2** 2 C/O contacts
- **3** 3 C/O contacts
- **5** 4 C/O contacts

Contact material
- **7** AgNi 90/10, with test button*)
- **8** AgNi 90/10, gold plated, with test button*)

Version
- **0** standard, AMP 2.8
- **1** PCB terminals

Coil
Coil code: please refer to coil versions table, preferred types in bold print

*) Version with closed cap without test button available on request.
Other types on request.

Multimode Relay MT

2 / 3 pole 10 A, DC- or AC-coil

F0161-A

Features

- 2 C/O or 3 C/O contacts
- Cadmium-free contacts
- DC and AC coils
- Mechanical indicator as standard
- Electrical indicator
- New test system with front operated finger protected push-to-test button and integral locking test tab

Applications

Mechanical engineering, plant control

Technical data of approved types on request

Contact data

Configuration	2 C/O contact or 3 C/O contact	
Type of contact	single contacts	bifurcated contacts
Rated current	10 A	4 A
Rated voltage / max.breaking voltage AC	250 Vac / 440 Vac	
Maximum breaking capacity AC	2500 VA	500 VA
Make current (max. 4 s at duty cycle 10%)	20 A	8 A
Contact material	AgNi 90/10	
Minimum contact load	24 V, 10 mA	20 mV, 1 mA gold plated

Contact ratings

Type	Load	Operations	Standard
MT321	10 A, 250 Vac, C/O contact	$1x10^5$	VDE 0435

Coil data

Nominal voltage	DC coil	6...220 Vdc
	AC coil	6...230 Vac
Nominal coil power	DC coil	typ. 1.2 W
	AC coil	typ. 2.3 VA
Operate category		1 / a

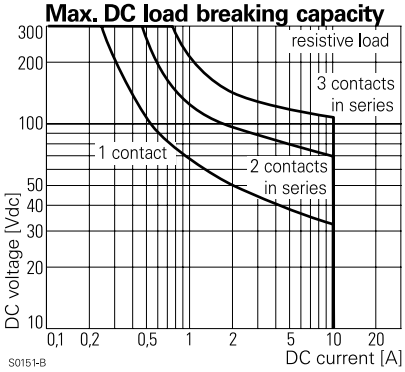
Coil versions, DC-coil

Coil code standard	PD*	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Coil resistance Ω	Coil current mA
006	0A6	6	4.5	0.6	32±10%	187.5
012	0B2	12	9.0	1.2	110±10%	109.1
024	**0C4**	**24**	**18.0**	**2.4**	**475±10%**	**50.5**
048	0E8	48	36.0	4.8	2000±10%	24.0
060	0G0	60	45.0	6.0	2850±10%	21.1
110	1B0	110	82.5	11.5	10000±12%	11.0
220	2C0	220	165.0	22.0	40000±15%	5.5

All figures are given for coil without preenergization, at ambient temperature +20 °C

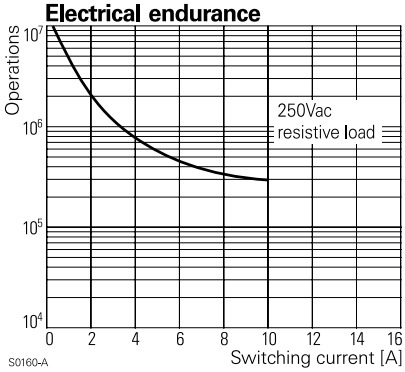
* Protection diode PD; standard polarity: 2-pole relays: +2 / -7,
3-pole relays: +2 / -10

Max. DC load breaking capacity



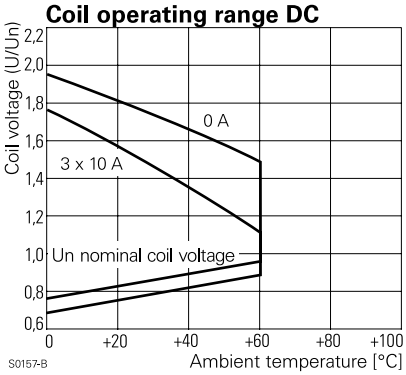
S0151-B

Electrical endurance



S0160-A

Coil operating range DC



S0157-B

Multimode Relay MT

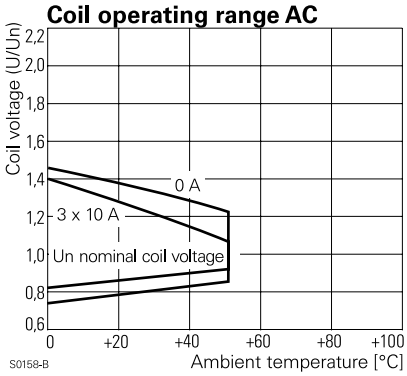
2 / 3 pole 10 A, DC- or AC-coil

Coil versions, AC-coil

Coil code	Nominal voltage Vac	Pull-in voltage Vac	Release voltage Vac	Maximum voltage Vac	Coil resistance Ω	Coil current mA
006	6	4.8	2.4	7.8	5.3±10%	381.7
012	12	9.6	4.8	15.6	24±10%	182.5
024	**24**	**19.2**	**9.6**	**31.2**	**86±10%**	**94.2**
048	48	38.4	19.2	62.4	345±10%	47.5
060	60	48.0	24.0	78.0	544±10%	37.8
115	115	92.0	46.0	149.5	2000±10%	20.6
230	**230**	**184.0**	**92.0**	**299.0**	**8300±12%**	**10.1**

All figures are given for coil without preenergization, at ambient temperature +20 °C

Coil operating range AC

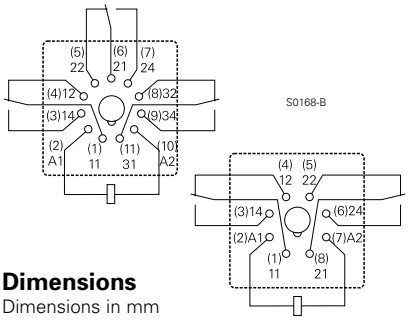


Insulation

Dielectric strength	coil-contacts	2500 V_{rms}
	open contact circuit	1500 V_{rms}
	adjacent contacts	2500 V_{rms}
Clearance / creepage		2.8 / 4 mm
Insulation to IEC 60664		
Voltage rating		250 V
Pollution degree		3
Overvoltage category		III
Insulation to VDE 0110b (2/79)		C / 250
Tracking resistance of relay base		CTI 175

Terminal assignment

View on solder pins

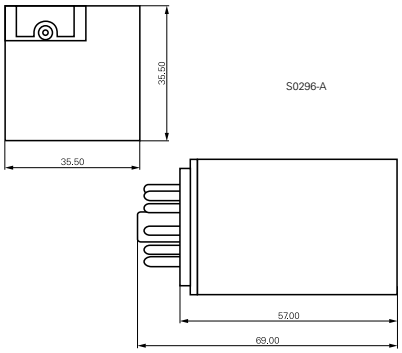


Other data

Flammability class according to UL 94		V-0
Ambient temperature	DC-coil	-45...+60 °C
	AC-coil	-45...+50 °C
Mechanical life		>20x10^6 operations
Max. switching rate at rated- / minimum load		20 min^{-1} / 100 min^{-1}
Operate- / release time		12 / 5 ms
Bounce time		4 ms
Vibration resistance N/O / N/C contact		>5 / 2 g
Shock resistance (function) N/O contact / N/C contact		>50 / 10 g
Category of protection (IEC 61810)		RT I - dust protected
Relay weight		80 g
Packaging unit		25 pcs.
Accessories		see accessories MT

Dimensions

Dimensions in mm



Product key

M T

Type

Contact configuration

2 2 C/O contacts, 8-pole
3 3 C/O contacts, 11-pole

Contact material

2 AgNi 90/10
3 AgNi 90/10, gold plated
B AgNi 90/10, bifurcated contacts, gold plated

Version

1 DC with test button
3 DC with test button and bipolar LED
6 AC with test button
8 AC with test button and LED

Coil

Coil code: please refer to coil versions table, preferred types in bold print

Other types on request

Power Relay RM 2/3/7

2 / 3 pole 10 / 16 A, DC- or AC-coil

F0163-A

Features

- 2 C/O or 3 C/O contacts
- Switching capacity up to 6000 VA
- DC- or AC-coil
- Mechanical indicator
- Push-to-test-button
- Plug-in version, PCB terminals, chassis- or DIN-rail mount

Applications

Elevator control, power supplies

Technical data of approved types on request

Contact data	RM 2	RM 3	RM 7
Configuration	2 C/O	3 C/O	3 C/O
Type of contact		single contact	
Rated current	16 A	10 A	16 A
Rated voltage / max.breaking voltage AC		380 Vac / 440 Vac	
Maximum breaking capacity AC	6000 VA	3800 VA	6000 VA
Make current	40 A	40 A	40 A
Contact material		AgCdO	

Contact ratings		
Type	Load	Standard
RM2	1hp, 240 Vac, per contact	UL 508
RM7	1.5hp, 240 Vac, 3-phase	UL 508
RM7	15 A, 250 Vac, per contact	UL 508
RM3	1 / 2hp, 240 Vac, per contact	UL 508
RM3	10 A, 240 Vac, per contact	UL 508

Coil data		RM 2	RM 3	RM 7
Nominal voltage	DC coil		6...220 Vdc	
	AC coil		6...400 Vac	
Nominal coil power	DC coil	1.2 W	1.2 W	1.6 W
	AC coil	2.3 VA	2.3 VA	2.8 VA

Coil versions, DC-coil, RM2, RM3

Coil code STD	LED bipolar	PD*	LED PD*	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Coil resistance Ω	Coil current mA
006	L06	0A6	LA6	6	4.5	0.6	32±10%	187.5
012	L12	0B2	LB2	12	9.0	1.2	110±10%	109.1
024	**L24**	**0C4**	**LC4**	**24**	**18.0**	**2.4**	**475±10%**	**50.5**
048	L48	0E8	LE8	48	36.0	4.8	2000±10%	24.0
060	L60	0G0	LG0	60	45.0	6.0	2850±10%	21.1
110	M10	1B0	MB0	110	82.5	11.0	10000±12%	11.0
221	N21	2C1	NC1	220	165.0	22.0	40000±15%	5.5

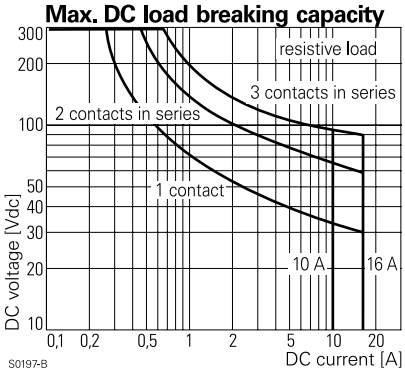
Coil versions, DC-coil, RM7

006	L06	0A6	LA6	6	4.5	0.6	24±10%	250.0
012	L12	0B2	LB2	12	9.0	1.2	86±10%	139.5
024	**L24**	**0C4**	**LC4**	**24**	**18.0**	**2.4**	**345±10%**	**69.6**
048	L48	0E8	LE8	48	36.0	4.8	1340±10%	35.8
060	L60	0G0	LG0	60	45.0	6.0	2200±10%	27.3
110	M10	1B0	MB0	110	82.5	11.0	7300±10%	15.1
221	N21	2C1	NC1	220	165.0	22.0	30000±15%	7.3

All figures are given for coil without preenergization, at ambient temperature +20 °C

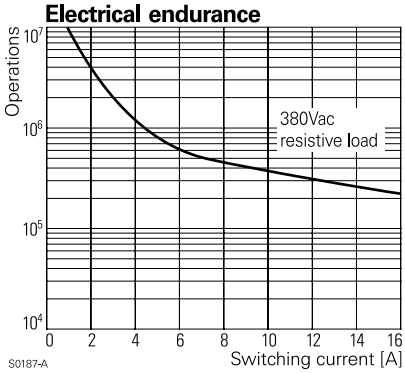
* Protection diode PD; standard polarity: +A1 / -A2

Max. DC load breaking capacity



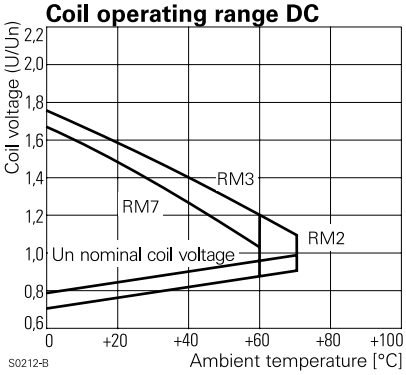
S0197-B

Electrical endurance



S0187-A

Coil operating range DC



S0212-B

Power Relay RM 2/3/7

2 / 3 pole 10 / 16 A, DC- or AC-coil

Coil versions, AC-coil, RM2, RM3

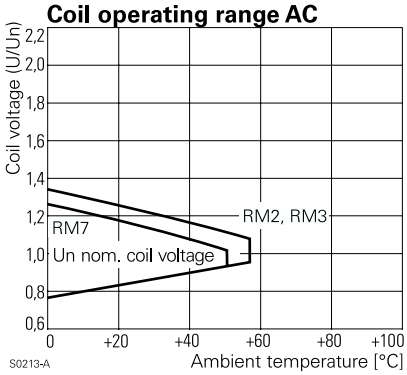
Coil code Standard	LED	Nominal voltage Vac	Pull-in voltage Vac	Release voltage Vac	Coil resistance Ω	Coil current mA
506	R06	6	4.8	2.4	5.3±10%	381.7
512	R12	12	9.6	4.8	24±10%	182.5
524	**R24**	**24**	**19.2**	**9.6**	**86±10%**	**94.2**
548	R48	48	38.4	19.2	345±10%	47.5
560	R60	60	48.0	24.0	544±10%	37.8
615	S15	115	92.0	46.0	2000±10%	20.6
730	**T30**	**230**	**184.0**	**92.0**	**8300±12%**	**10.1**
900	V00	400	320.0	160.0	27500±15%	5.8

Coil versions, AC-coil, RM2, RM3

506	R06	6	4.8	2.4	4.7±10%	476.7
512	R12	12	9.6	4.8	19.5±10%	225.8
524	**R24**	**24**	**19.2**	**9.6**	**80±10%**	**109.2**
548	R48	48	38.4	19.2	320±10%	54.2
560	R60	60	48.0	24.0	500±10%	43.7
615	S15	115	92.0	46.0	1850±10%	23.0
730	**T30**	**230**	**184.0**	**92.0**	**7500±10%**	**11.7**
900	V00	400	320.0	160.0	23500±15%	6.5

All figures are given for coil without preenergization, at ambient temperature +20 °C

Coil operating range AC



Insulation

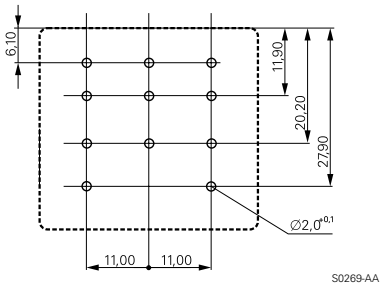
Dielectric strength	coil-contacts	2500 V_{rms}
	open contact circuit	1500 V_{rms}
	adjacent contacts	2500 V_{rms}
Clearance / creepage		≥ 3.5 / 6 mm
Insulation to VDE 0110b (2/79)		
Insulation category / reference voltage		C / 400 with fully isolated Faston connectors

Other data

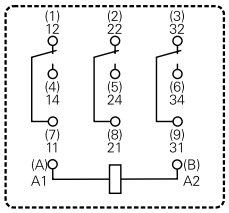
	RM 2	RM 3	RM 7
Ambient temperature DC-coil	-45...+70 °C	-45...+60 °C	-45...+60 °C
AC-coil	-45...+55 °C	-45...+55 °C	-45...+50 °C
Mechanical life		>20x10^6 operations	
Max. switching rate at rated- / minimum load		16 min^{-1} / 100 min^{-1}	
Operate- / release time		approx. 15 / 10 ms	
Bounce time		approx. 3 ms	
Vibration resistance N/O / N/C contact	>5 / 2 g	>5 / 2 g	>12 / 4 g
Category of protection (IEC 61810)		RT I - dust protected	
Relay weight		81 g	
Packaging unit		10 / 25 pcs.	
Accessories		see accessories RM	

PCB layout / terminal assignment

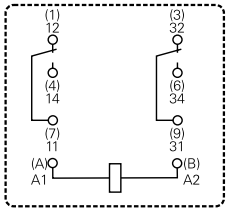
View on solder pins
Dimensions in mm



3 C/O contacts



2 C/O contacts



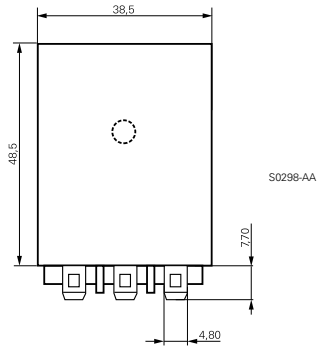
Power Relay RM 2/3/7

2 / 3 pole 10 / 16 A, DC- or AC-coil

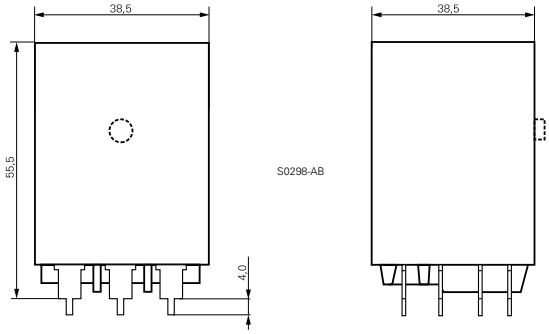
Dimensions

Dimensions in mm

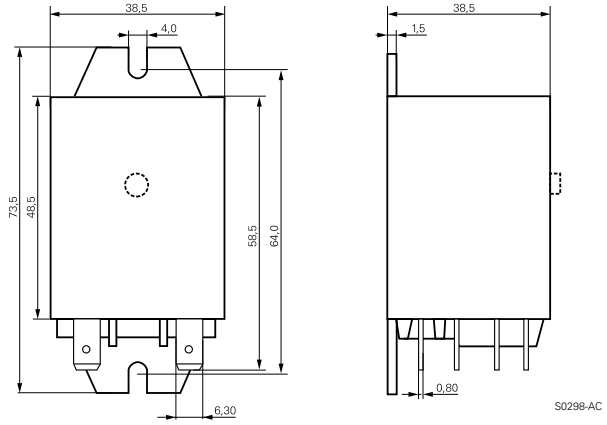
Plain cover, plug-in version



PCB version

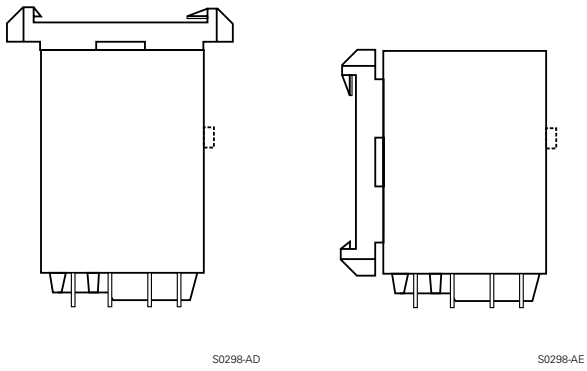


Cover with mounting brackets, FASTON 250 (187 available)



Cover with DIN-snap-on attachement (FASTON 250 only)

horizontal vertical



Product key

R M

Type

Contacts

- **2** 2 C/O contacts, 16 A
- **3** 3 C/O contacts, 10 A
- **7** 3 C/O contacts, 16 A

Version

- **0** without test button
- **3** with test button

Enclosure

- **2** plain cover, AMP-Faston 187
- **3** cover with mounting brackets, AMP-Faston 187
- **5** cover with mounting brackets, AMP-Faston 250
- **7** PCB version
- **8** cover with DIN-snap-on attachement, horizontal, AMP-Faston 250
- **9** cover with DIN-snap-on attachement, vertical, AMP-Faston 250

Coil

Coil code: please refer to coil versions table, preferred types in bold print

AMP-Faston 187 = 4.8 x 0.5 mm AMP-Faston 250 = 6.3 x 0.8 mm

Power Relay RM 5/6

2 / 3 pole 10 / 16 A, DC- or AC-coil

F0164-A

Features

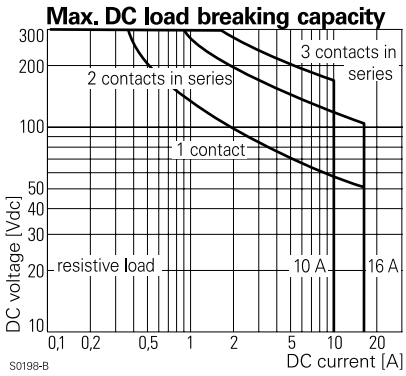
- 2 N/O or 3 N/O contacts
- 3 mm contact gap
- Push-to-test-button
- Plug-in version, PCB terminals, chassis- or DIN-rail mount

Applications

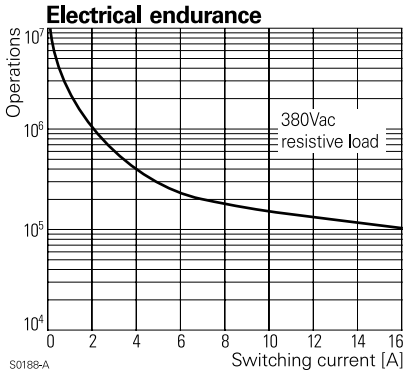
Power supplies, pump control

Technical data of approved types on request

Contact data	RM 5	RM 6
Configuration	2 N/O contact	3 N/O contact
Type of contact	single contact	
Rated current	16 A	10 A
Rated voltage / max.breaking voltage AC	380 Vac / 440 Vac	
Maximum breaking capacity AC	6000 VA	3800 VA
Make current (max. 4 s at duty cycle 10%)	25 A	25 A
Contact material	AgCdO	



Coil data		
Nominal voltage	DC coil	6...220 Vdc
	AC coil	6...400 Vac
Nominal coil power	DC coil	1.6 W
	AC coil	2.8 VA

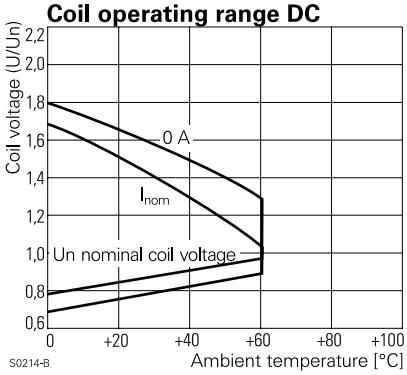


Coil versions, DC-coil, RM5, RM6

Coil code STD	LED bipolar	PD*	LED PD*	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Coil resistance Ω	Coil current mA
006	L06	0A6	LA6	6	4.5	0.6	24±10%	250.0
012	L12	0B2	LB2	12	9.0	1.2	86±10%	139.5
024	**L24**	**0C4**	**LC4**	**24**	**18.0**	**2.4**	**345±10%**	**69.6**
048	L48	0E8	LE8	48	36.0	4.8	1340±10%	35.8
060	L60	0G0	LG0	60	45.0	6.0	2200±10%	27.3
110	M10	1B0	MB0	110	82.5	11.0	7300±10%	15.1
221	N21	2C1	NC1	220	165.0	22.0	30000±15%	7.3

All figures are given for coil without preenergization, at ambient temperature +20 °C

* Protection diode PD; standard polarity: +A1 / -A2



Power Relay RM 5/6

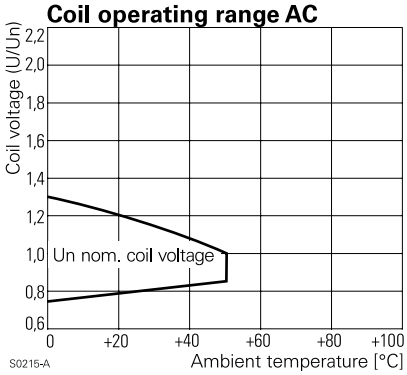
2 / 3 pole 10 / 16 A, DC- or AC-coil

Coil versions, AC-coil, RM5, RM6

Coil code Standard	LED	Nominal voltage Vac	Pull-in voltage Vac	Release voltage Vac	Coil resistance Ω	Coil current mA
506	R06	6	4.8	2.4	4.7±10%	476.7
512	R12	12	9.6	4.8	19.5±10%	225.8
524	**R24**	**24**	**19.2**	**9.6**	**80±10%**	**109.2**
548	R48	48	38.4	19.2	320±10%	54.2
560	R60	60	48.0	24.0	500±10%	43.7
615	S15	115	92.0	46.0	1850±10%	23.0
730	**T30**	**230**	**184.0**	**92.0**	**7500±10%**	**11.7**
900	V00	400	320.0	160.0	23500±15%	6.5

All figures are given for coil without preenergization, at ambient temperature +20°C

Coil operating range AC



Insulation

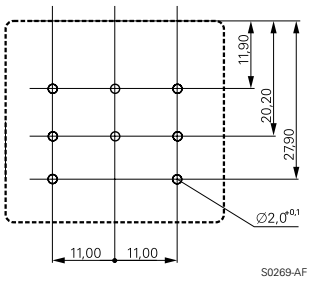
Dielectric strength	coil-contacts	2500 V_{rms}
	open contact circuit	2500 V_{rms}
	adjacent contacts	2500 V_{rms}
Clearance / creepage		≥ 3.5 / 6 mm
Insulation to VDE 0110b (2/79)		
Insulation category / reference voltage		C / 400 with fully isolated Faston connectors

Other data

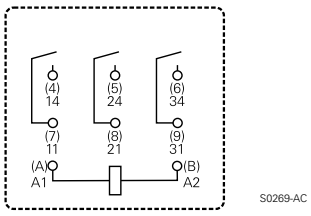
Ambient temperature	DC-coil	-45...+60 °C
	AC-coil	-45...+50 °C
Mechanical life		>20x10⁶ operations
Max. switching rate at rated- / minimum load		16 min^{-1} / 100 min^{-1}
Operate- / release time		approx. 15 / 10 ms
Bounce time		approx. 4 ms
Vibration resistance		>12 g, 30...150 Hz
Category of protection (IEC 61810)		RT I - dust protected
Relay weight		81 g
Packaging unit		10 / 25 pcs.
Accessories		see accessories RM

Printbild/Schaltbild

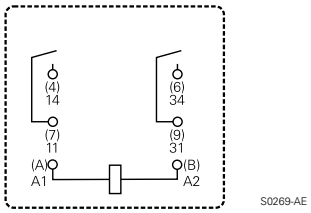
Ansicht auf die Anschlüsse
Abmessungen in mm



3 Schließer



2 Schließer



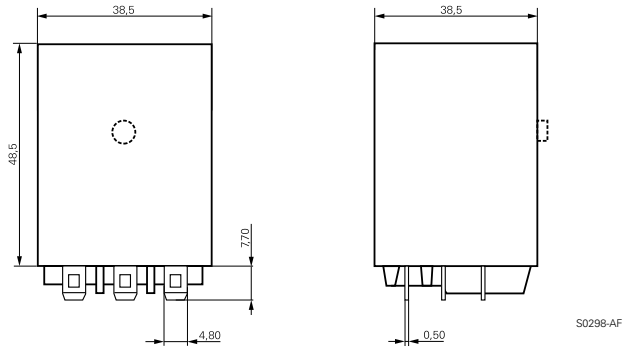
Power Relay RM 5/6

2 / 3 pole 10 / 16 A, DC- or AC-coil

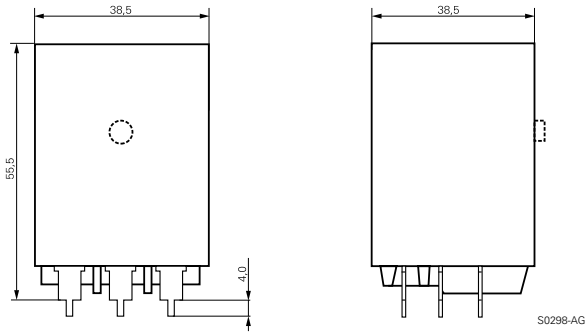
Dimensions

Dimensions in mm

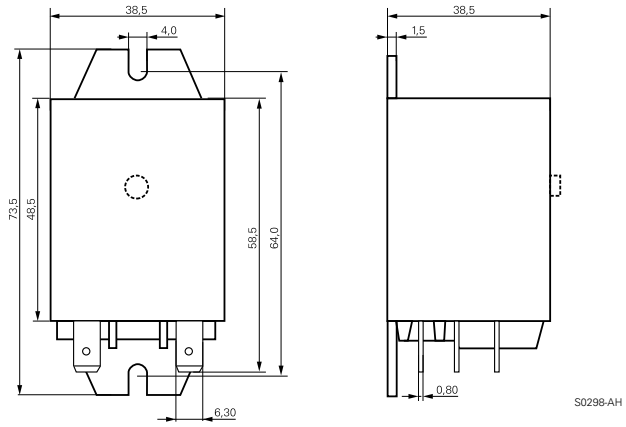
Plain cover, plug-in version



PCB version

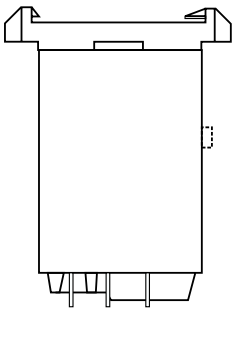


Cover with mounting brackets, FASTON 250 (187 available)

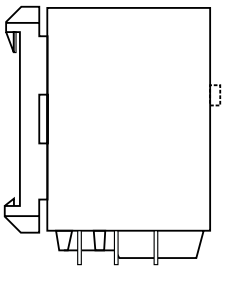


Cover with DIN-snap-on attachement (FASTON 250 only)

horizontal



vertical



Product key

R M

Type

Contacts

5 2 N/O contacts, 16 A **6** 3 N/O contacts, 10 A

Version

0 without test button, without mechanical indicator

3 with test button, without mechanical indicator

Mounting

2 plain cover, AMP-Faston 187

3 cover with mounting brackets, AMP-Faston 187

5 cover with mounting brackets, AMP-Faston 250

7 PCB version

8 cover with DIN-snap-on attachement, horizontal, AMP-Faston 250

9 cover with DIN-snap-on attachement, vertical, AMP-Faston 250

Coil

Coil code: please refer to coil versions table, preferred types in bold print

AMP-Faston 187 = 4.8 x 0.5 mm AMP-Faston 250 = 6.3 x 0.8 mm

Power Relay RM 8

2 pole 25 A, DC- or AC-coil

F0165-A

Features

- 2 C/O contacts
- DC- or AC-coil
- Mechanical indicator
- Push-to-test-button
- Chassis- or DIN-rail mount

Applications

Cleaning equipment, heating and cooling equipment

Technical data of approved types on request

Contact data

Configuration	2 C/O contact
Type of contact	single contact
Rated current	25 A
Rated voltage / max.breaking voltage AC	250 Vac / 440 Vac
Maximum breaking capacity AC	6000 VA
Make current (max. 4 s at duty cycle 10%)	60 A
Contact material	AgCdO

Contact ratings

Type	Load	Standard
RM8	2hp, 240 Vac, per contact	UL 508
RM8	1.5hp, 120 Vac, per contact	UL 508
RM8	25 A, 240 Vac, per contact	UL 508

Coil data

Nominal voltage	DC coil	6...220 Vdc
	AC coil	6...400 Vac
Nominal coil power	DC coil	1.2 W
	AC coil	2.8 VA

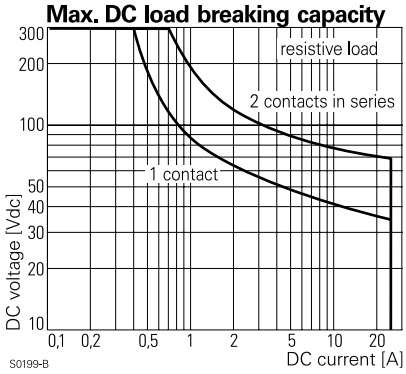
Coil versions, DC-coil, RM8

Coil code STD	LED bipolar	PD*	LED PD*	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Coil resistance Ω	Coil current mA
006	L06	0A6	LA6	6	4.5	0.6	32±10%	187.5
012	L12	0B2	LB2	12	9.0	1.2	110±10%	109.1
024	**L24**	**0C4**	**LC4**	**24**	**18.0**	**2.4**	**475±10%**	**50.5**
048	L48	0E8	LE8	48	36.0	4.8	2000±10%	24.0
060	L60	0G0	LG0	60	45.0	6.0	2850±10%	21.1
110	M10	1B0	MB0	110	82.5	11.0	10000±12%	11.0
221	N21	2C1	NC1	220	165.0	22.0	40000±15%	5.5

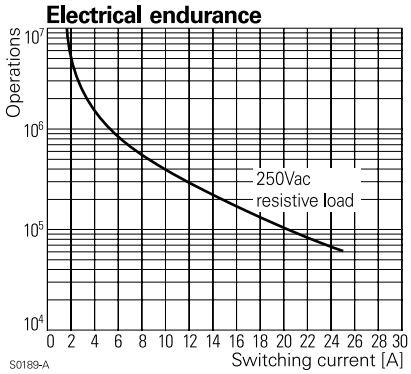
All figures are given for coil without preenergization, at ambient temperature +20 °C

* Protection diode PD; standard polarity: +A1 / -A2

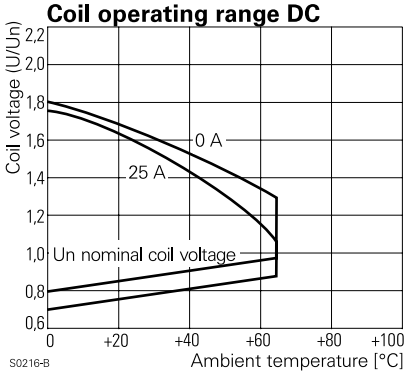
Max. DC load breaking capacity



Electrical endurance



Coil operating range DC



Power Relay RM 8

2 pole 25 A, DC- or AC-coil

Coil versions, AC-coil, RM8

Coil code Standard	LED	Nominal voltage Vac	Pull-in voltage Vac	Release voltage Vac	Coil resistance Ω	Coil current mA
506	R06	6	4.8	2.4	4.7±10%	476.7
512	R12	12	9.6	4.8	19.5±10%	225.8
524	**R24**	**24**	**19.2**	**9.6**	**80±10%**	**109.2**
548	R48	48	38.4	19.2	320±10%	54.2
560	R60	60	48.0	24.0	500±10%	43.7
615	S15	115	92.0	46.0	1850±10%	23.0
730	**T30**	**230**	**184.0**	**92.0**	**7500±10%**	**11.7**
900	V00	400	320.0	160.0	23500±15%	6.5

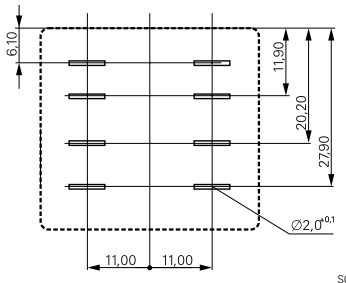
All figures are given for coil without preenergization, at ambient temperature +20 °C

Insulation

Dielectric strength	coil-contacts	2500 V_{rms}
	open contact circuit	1500 V_{rms}
	adjacent contacts	4000 V_{rms}
Clearance / creepage		≥ 2.8 / 4 mm
Insulation to VDE 0110b (2/79)		
Insulation category / reference voltage		C / 250

Terminal assignment

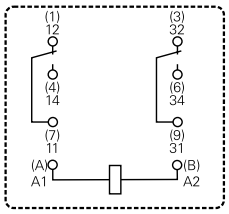
View on solder pins
Dimensions in mm



S0269-AG

Other data

Ambient temperature	DC-coil	-45...±65 °C
	AC-coil	-45...+40 °C
Mechanical life	>10x10⁶ operations	
Max. switching rate at rated- / minimum load	16 min^{-1} / 100 min^{-1}	
Operate- / release time	approx. 15 / 15 ms	
Bounce time	approx. 3 ms	
Vibration resistance N/O / N/C contact	>10 / 5 g, 30...150 Hz	
Category of protection (IEC 61810)	RT I - dust protected	
Relay weight	81 g	
Packaging unit	10 / 25 pcs.	



S0269-AD

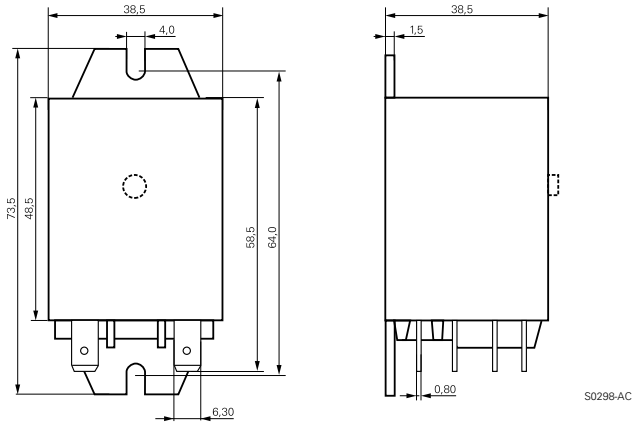
Power Relay RM 8

2 pole 25 A, DC- or AC-coil

Dimensions

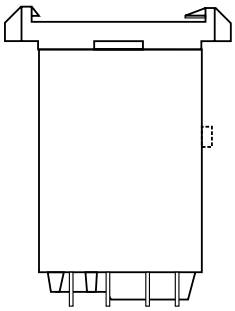
Dimensions in mm

Cover with mounting brackets, FASTON 250

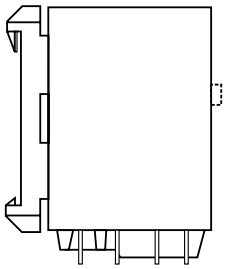


Cover with DIN-snap-on attachement

horizontal



vertical



Product key

R	M	8					

Type

Contacts

8 2 C/O contacts, 25 A

Version

0 without test button **3** with test button

Mounting

5 cover with mounting brackets, AMP-Faston 250

8 cover with DIN-snap-on attachement, horizontal, AMP-Faston 250

9 cover with DIN-snap-on attachement, vertical, AMP-Faston 250

Coil

Coil code: please refer to coil versions table, preferred types in bold print

AMP-Faston 250 = 6.3 x 0.8 mm

Notice

Power Relay RM C/D

1 pole 30 A, DC- or AC-coil

F0166-A

Features

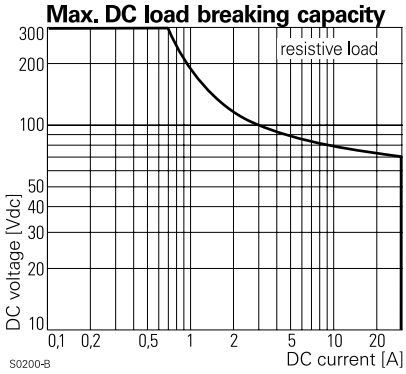
- 1 N/O or 1 N/O + 1 N/C contact
- Switching capacity up to 7200 VA
- DC- or AC-coil
- Push-to-test-button
- Chassis mount

Applications

Battery chargers, heating control

Contact data	RMC	RMD
Configuration	1 N/O and 1N/C	1 N/O
Type of contact	single contact, bridging contact	
Rated current	30 A	
Rated voltage / max.breaking voltage AC	250 Vac / 380 Vac / 440 Vac	
Maximum breaking capacity AC	7500 VA	
Make current (max. 4 s at duty cycle 10%)	60 A	
Contact material	AgCdO	

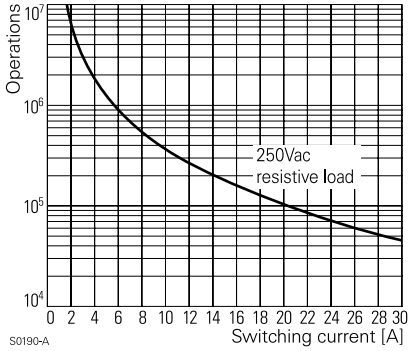
Max. DC load breaking capacity



S0200-B

Coil data		
Nominal voltage	DC coil	6...220 Vdc
	AC coil	6...400 Vac
Nominal coil power	DC coil	1.2 W
	AC coil	2.8 VA

Electrical endurance



S0190-A

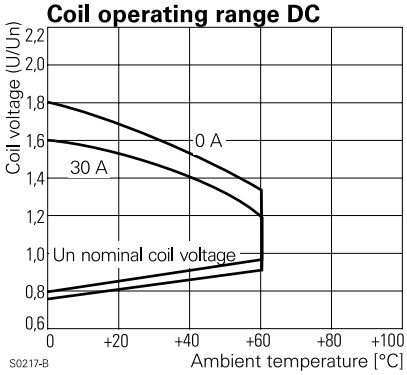
Coil versions, DC-coil, RMC, RMD

Coil code STD	LED bipolar	PD*	LED PD*	Nominal voltage Vdc	Pull-in voltage Vdc	Release voltage Vdc	Coil resistance Ω	Coil current mA
006	L06	0A6	LA6	6	4.5	0.6	32±10%	187.5
012	L12	0B2	LB2	12	9.0	1.2	110±10%	109.1
024	**L24**	**0C4**	**LC4**	**24**	**18.0**	**2.4**	**475±10%**	**50.5**
048	L48	0E8	LE8	48	36.0	4.8	2000±10%	24.0
060	L60	0G0	LG0	60	45.0	6.0	2850±10%	21.1
110	M10	1B0	MB0	110	82.5	11.0	10000±12%	11.0
221	N21	2C1	NC1	220	165.0	22.0	40000±15%	5.5

All figures are given for coil without preenergization, at ambient temperature +20 °C

* Protection diode PD; standard polarity: +A1 / -A2

Coil operating range DC



S0217-B

Power Relay RM C/D

1 pole 30 A, DC- or AC-coil

Coil versions, AC-coil, RMC, RMD

Coil code Standard	LED	Nominal voltage Vac	Pull-in voltage Vac	Release voltage Vac	Coil resistance Ω	Coil current mA
524	**R24**	**24**	**19.2**	**9.6**	**80±10%**	**109.2**
548	R48	48	38.4	19.2	320±10%	54.2
560	R60	60	48.0	24.0	500±10%	43.7
615	S15	115	92.0	46.0	1850±10%	23.0
730	**T30**	**230**	**184.0**	**92.0**	**7500±10%**	**11.7**
900	V00	400	320.0	160.0	23500±15%	6.5

All figures are given for coil without preenergization, at ambient temperature +20 °C

Insulation

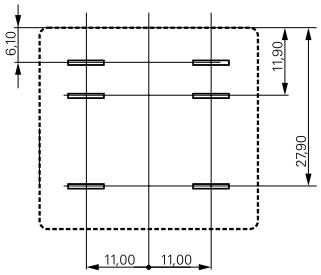
Dielectric strength	coil-contacts	2500 V_{rms}
	open contact circuit	1500 V_{rms}
	adjacent contacts	4000 V_{rms}
Clearance / creepage		≥ 2.8 / 4 mm
Insulation to VDE 0110b (2/79)		
Insulation category / reference voltage		C / 250

Other data

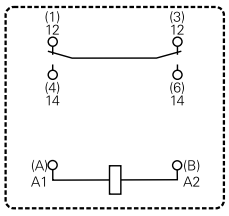
Ambient temperature	DC-coil	-45...+60 °C
	AC-coil	-45...+40 °C
Mechanical life	>10x10^6 operations	
Max. switching rate at rated- / minimum load	16 min^{-1} / 100 min^{-1}	
Operate- / release time	approx. 17 / 18 ms	
Bounce time	approx. 4 ms	
Vibration resistance N/O / N/C contact	>10 / 5 g, 30...150 Hz	
Category of protection (IEC 61810)	RT I - dust protected	
Relay weight	81 g	
Packaging unit	10 pcs.	

Terminal assignment

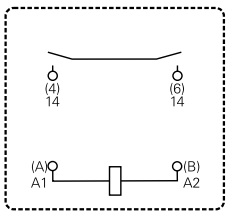
View on solder pins
Dimensions in mm



1 N/O and 1 N/C contact, RMC



1 N/O contact, RMD



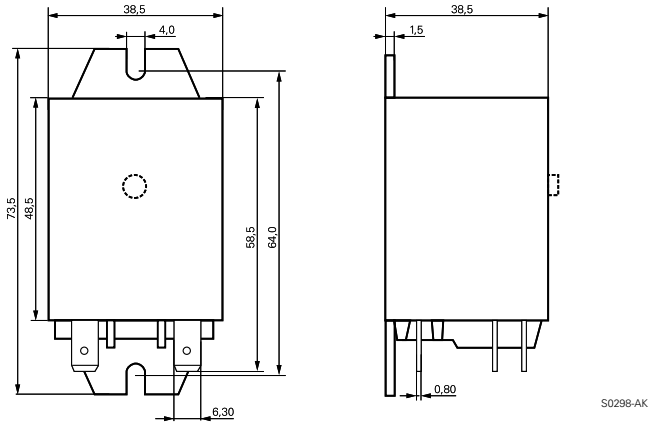
Power Relay RM C/D

1 pole 30 A, DC- or AC-coil

Dimensions

Dimensions in mm

Cover with mounting brackets, FASTON 250



Product key

R	M			5			

Type

Contacts

C 1 N/O contact and 1 N/C contact, 30 A

D 1 N/O contact, 30 A

Version

0 without test button **3** with test button

Mounting

5 cover with mounting brackets, AMP-Faston 250

Coil

Coil code: please refer to coil versions table, preferred types in bold print

AMP-Faston 250 = 6.3 x 0.8 mm

Accessories Slim Interface Relay SNR

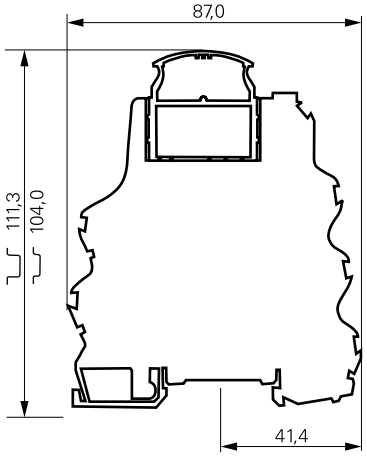
F0222-B

Features

- Module width 5.08 mm
- Reduced system width for increased packing density on the DIN rail
- Jumper bars

Dimensions in mm

Technical data	
Rated current / rated voltage	6 A / 250 Vac
Dielectric stregth coil-contact	>4000 V_{rms}
Insulation category (VDE 0110b)	C / 250
Ambient temperature	-20...55 °C
Protection category	IP 20
Protection against accidental contact meets	VBG 4
Wire cross section with/without bootlace crimp	0.22...2.5mm²
Terminal torque nom./max.	0.4 / 0.6 Nm
Packaging unit	10 pcs.



Accessories	
Product code	
ST 1F 000	Socket without LED
ST 1F L24	Socket with LED, 12...24 Vdc
ST 16 016	Mounting frame for relay, without marking
ST 17 002	Jumper bar 2 pole
ST 17 005	Jumper bar 5 pole
ST 17 010	Jumper bar 10 pole
ST 16 040	Marking plate, consisting of 100 marking tags

Available sets	
Set consisting of: relay in mounting frame, mounted on socket	
Product code	
ST 1P3 024	24 Vdc, AgSnO contacts
ST 1P3 L12	12 Vdc, with LED, AgSnO contacts
ST 1P3 L24	24 Vdc, with LED, AgSnO contacts
ST 1P3 L48	48 Vdc, with LED, AgSnO contacts
ST 1P2 L24	24 Vdc, with LED, AgSnO gold plated contacts

Accessories Miniature PCB Relay RYII

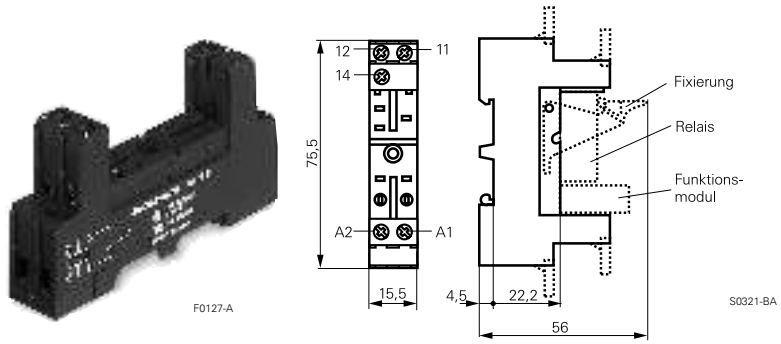
and similar design: pinning 3.2

Features

- Socket with PCB- or screw terminals
- No reduction of protection class or creepage/clearance with plastic retainer
- Easy replacement of relays
- Socket can be used as connector for diagnosis function
- Not suitable for MSR-type

Dimensions in mm
View on solder pins

RYII Socket with screw-type terminals for DIN-rail mounting



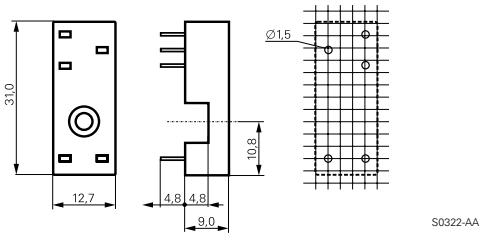
RY 78 626 Socket with screw-type terminals for DIN-rail mounting, pinning 3.2 mm

Socket with screw-type terminals for DIN-rail mounting	
Type	
RY 78 626	Socket with screw-type terminals for DIN-rail mounting, pinning 3.2 mm
Accessories for RY 78 626	
RY 16 046	Plastic retaining clip
RY 16 040	Marking tag
RPM	Modules see accessories RT / RP

Technical data	
Rated current	12 A
Rated voltage	300 Vac
Dielectric strength coil/cont.	>4000 V_{rms}
Insulation cat. (VDE 0110b)	C / 250 Vac
Ambient temperature	-25...+85 °C
Protection category	IP 20
Protection against accidental contact meets	VBG 4
Wire cross section	2 x 2.5 mm²
with bootlace crimp	2 x 1.5 mm²
Packaging unit	10 pcs.

RYII Socket with PCB terminals

RY 78 600 pinning 3.2 mm



RY 78 600 Socket with PCB terminals, pinning 3.2 mm

Socket with PCB terminals	
Type	
RY 78 600	Socket with PCB terminals, pinning 3.2 mm
Accessories for RY 78 600	
RY 16 037	Plastic retaining clip

Technical data	
Rated current	12 A
Rated voltage	300 Vac
Dielectric strength coil/cont.	>5000 V_{rms}
Insulation cat. (VDE 0110b)	C / 250 Vac
Ambient temperature	-40...+80 °C
Packaging unit	100 pcs.

Accessories Industrial Power Relay RT / RP / SR2

and similar design: pinnings 3.5mm / 5mm; relay heights 15.7 / 25.5mm

F0228-A

Features

- New retainer clip with ejection function
- Easy replacement of relays on a densely packed DIN rail
- High quality rising clamp terminals
- Captive combination terminal screws
- No reduction of protection class or creepage/clearance with plastic retainer
- Simple plug-in indicator- and protection modules
- White snap-on tags
- Not suitable for bistable relays with 2 coils

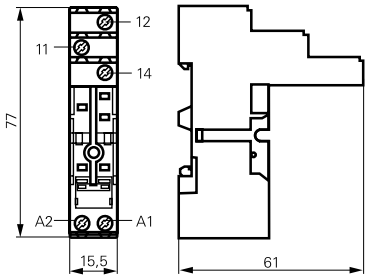
Accessories for sockets:

- Rejector
- LED- and protection modules
- Marking tags

Dimensions in mm

Socket with screw-type terminals for DIN rail mounting

F0229-A



S0416-AA

YRT 78 624 and YRT 78 626

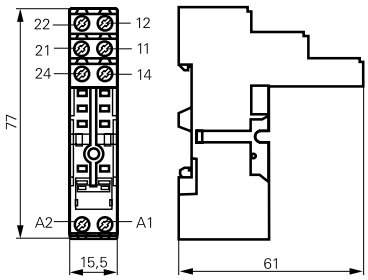
- Logical setup of connections (input / output)
- Safe separation to VDE 0106

YRT 78 624 Socket with screw-type terminals, pinning 3.5 mm for DIN rail mounting

cULus

Technical data	
Rated current	12 A
Rated voltage	250 Vac
Insulation cat. (VDE 0110b)	C / 250 Vac
Ambient temperature	-25...85 °C
Protection category	IP 20
Wire cross section	2 x 2.5 mm²
with bootlace crimp	2 x 1.5 mm²
Terminal torque	0.5 Nm
max.	0.7 Nm
Packaging unit	10 pcs.

F0230-A



S0416-AB

YRT 78 626 Socket with screw-type terminals, pinning 5 mm for DIN rail mounting

cULus

Technical data		
Rated current	1 pole	12 A *)
	2 pole	2 x 12 A
Rated voltage		250 Vac
Insulation cat. (VDE 0110b)		C / 250 Vac
Ambient temperature		-25...85 °C
Protection category		IP 20
Wire cross section		2 x 2.5 mm²
with bootlace crimp		2 x 1.5 mm²
Terminal torque		0.5 Nm
max.		0.7 Nm
Packaging unit		10 pcs.

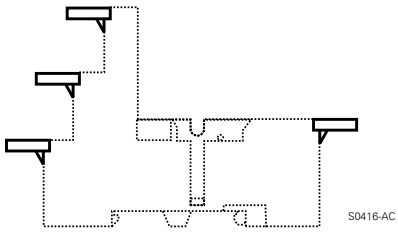
*) For 1 pole relays (16 A) the relay terminals 11-21, 12-22 and 14-24 have to be bridged
For 1 pole relays (12 A) the relay terminals 11-12-14 have to be connected to the socket terminals 21-12-24

Socket with screw-type terminals for DIN rail mounting	
Type	
YRT 78 624	Socket with screw-type terminals, pinning 3.5 mm for DIN rail mounting
YRT 78 626	Socket with screw-type terminals, pinning 5 mm for DIN rail mounting

Accessories Industrial Power Relay RT / RP / SR2

and similar design: pinnings 3.5mm / 5mm; relay heights 15.7 / 25.5mm

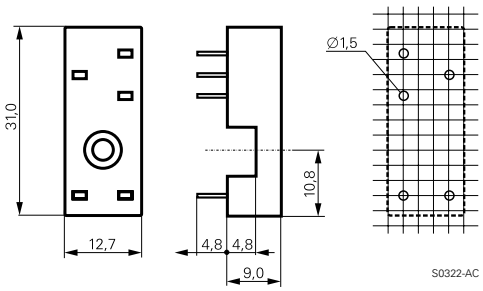
Accessories for YRT 78 724, YRT 78 726	
Type	
YRT 16 016	Plastic retaining clip, relay height 15.7 and 25.5 mm
YRT 16 040	Marking tag



Marking tags
- White marking area 15.5 x 6 mm
- Snaps on socket in up to 4 positions

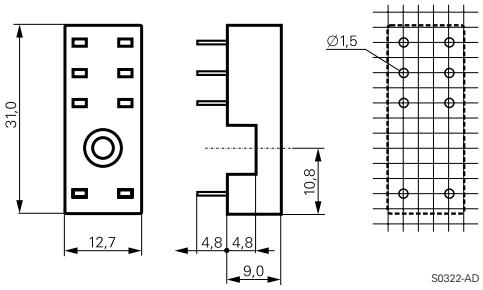
LED- and Protection Modules for YRT 78 724, YRT 78 726		
Easy insertion of module into the socket		
Wiring in parallel to the coil		
Type		
YMFDG 230	Protection diode (A1+, A2-), 6/230 VDC	
YMRCW 024	RC-network 6...60 Vac	
YMRCW 230	RC-network 110...230 Vac	
YMVAW 024	Varistor 24 Vac	
YMVAW 230	Varistor 230 Vac	
LED red	**LED** green	
YMLRA 024	**YMLGA 024**	LED 6...24 Vdc/Vac
YMLRD 024-A	**YMLGD 024**	LED 6...24 Vdc w. prot.diode (A1+, A2-)
YMLRD 024		LED 6...24 Vdc w. prot. diode (A1-, A2+)
YMLRW 230	**YMLGW 230**	LED 110...230 Vac

Socket with PCB terminals



RP 78 601 Socket with PCB terminals, pinning 3.5 mm

Technical data	
Rated current	12 A
Rated voltage	300 Vac
Dielectric strength coil/cont.	>5000 V_{rms}
Insulation cat. (VDE 0110b)	C / 250 Vac
Ambient temperature	-40...+80 °C
Packaging unit	100 pcs.



RP 78 602 Socket with PCB terminals, pinning 5 mm

Technical data		
Rated current	1 pole	12 A
	2 pole	2 x 12 A
Rated voltage		300 Vac
Dielectric strength coil/cont.		>5000 V_{rms}
Insulation cat. (VDE 0110b)		C / 250 Vac
Ambient temperature		-40...+80 °C
Packaging unit		100 pcs.

Socket with PCB terminals	
Type	
RP 78 601	Socket with PCB terminals,pinning 3.5 mm
RP 78 602	Socket with PCB terminals,pinning 5 mm

Accessories for RP 78 601, RP 78 602	
Type	
RT 16 041	Plastic retaining clip RT, relay height 15.7 mm
RP 16 100	Plastic retaining clip RP, relay height 25.5 mm
RT 28 516	Metal retaining clip RT, relay height 15.7 mm
RP 28 500	Metal retaining clip RP, relay height 25.5 mm

Accessories PCB Relay Card Relay RP I

and similar design: pinning 2.5 mm

F0227-A

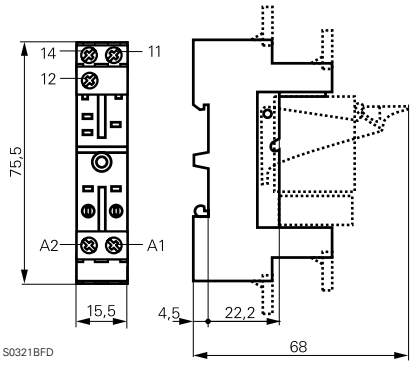
Features

- Socket with PCB- or screw terminals
- No reduction of protection class or creepage / clearance with plastic retainer
- Easy replacement of relays
- Socket can be used as connector for diagnosis function

Dimensions in mm
View on solder pins

Socket with screw-type terminals for DIN-rail mounting

F0118-A



S0321BFD

RP 78 623 Socket with screw-type terminals, pinning 2.5 mm, for DIN-rail mounting

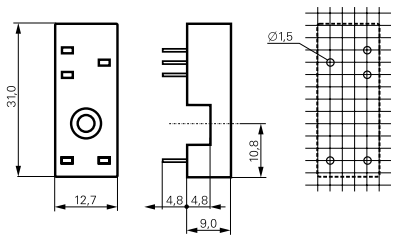
Socket with screw-type terminals for DIN-rail mounting	
Product code	
RP 78 623	Socket with screw-type terminals, pinning 2.5 mm for DIN-rail mounting

Accessories for RP 78 623	
Ordering code	Type
RP 16 104	Plastic retaining clip
RY 16 040	Marking tag
RP M	Modules see accessories RT / RP

Technical data	
Rated current	12 A
Rated voltage	300 Vac
Dielectric strength coil/cont.	>4000 V_{rms}
Insulation cat. (VDE 0110b)	C / 250 Vac
Ambient temperature	-25...+85 °C
Protection category	IP 20
Protection against accidental contact meets	VBG 4
Wire cross section	2 x 2.5 mm²
with bootlace crimp	2 x 1.5 mm²
Packaging unit	10 pcs.

Socket with PCB terminals

F0137-A



S0322-AE

RP 78 600 Socket with PCB terminals, pinning 2.5 mm

Socket with PCB terminals	
Product code	
RP 78 600	Socket with PCB terminals, pinning 2.5 mm

Accessories for RP 78 600	
RP 16 100	Plastic retaining clip
RP 28 500	Metal retaining clip

Technical data	
Rated current	12 A
Rated voltage	300 Vac
Dielectric strength coil/cont.	>5000 V_{rms}
Insulation cat. (VDE 0110b)	C / 250 Vac
Ambient temperature	-40...+80 °C
Packaging unit	100 pcs.

Notice

Accessories Miniature Relay PT

and similar design: relay heights 29 / 34.6 / 35.2 / 36.6 / 37.6mm

F0233-A

Features

- Easy replacement of relays on a densely packed DIN rail
- High quality rising clamp terminals
- Captive combination terminal screws
- No reduction of protection class or creepage/clearance with plastic retainer
- Simple plug-in indicator- and protection modules
- White snap-on tags

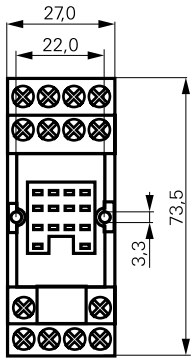
Accessories for sockets:

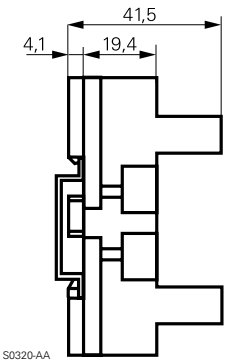
- Retaining clip
- LED- and protection modules
- Marking tags

Dimensions in mm

PT DIN-rail socket with screw type terminals

F0234-A





S0320-AA

cULus

Technical data		
Rated current	4-pole	6 A
	3-pole	10 A
	2-pole	12 A
Rated voltage		250 Vac
Insulation cat. (VDE 0110b)		C / 250 Vac
Ambient temperature		-45...+70 °C
Protection category		IP 20
Protection against accidental contact meets		VBG 4
Wire cross section		2 x 2.5 mm²
with bootlace crimp		2 x 1.5 mm²
Terminal torque		0.5 Nm
max.		0.7 Nm
Packaging unit		50 pcs.

DIN-rail socket with screw type terminals	
Type	
YPT 78 702	DIN-rail socket with screw type terminals, 2 pole
YPT 78 703	DIN-rail socket with screw type terminals, 3 pole
YPT 78 704	DIN-rail socket with screw type terminals, 4 pole
YPT 78 110	DIN-rail socket with screw type terminals, 4 pole package with protection diode module

Accessories for YPT 78 702, YPT 78 703, YPT 78 704, YPT 78 110	
Type	
YPT 16 016	Plastic clip PT, HC28
PT 28 800	Metal clip PT, HC28
YPT 16 040	Marking tag

LED- and Protection Modules for YPT 78 702, 78 703, 78 704, 78 110		
Easy insertion of module into the socket		
Wiring in parallel to the coil		
Type		
YMFDG 230	Protection diode (A1+, A2-), 6/230 VDC	
YMRCW 024	RC-network 6...60 Vac	
YMRCW 230	RC-network 110...230 Vac	
YMVAW 024	Varistor 24 Vac	
YMVAW 230	Varistor 230 Vac	
LED red	**LED** green	
YMLRA 024	**YMLGA 024**	LED 6...24 Vdc/Vac
YMLRD 024-A	**YMLGD 024**	LED 6...24 Vdc w. prot.diode (A1+, A2-)
YMLRD 024		LED 6...24 Vdc w. prot. diode (A1-, A2+)
YMLRW 230	**YMLGW 230**	LED 110...230 Vac

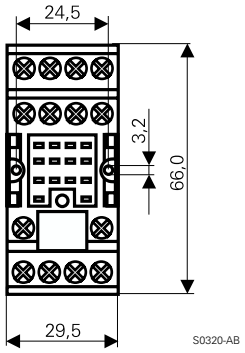
F0231-A

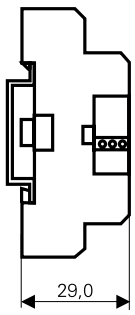
F0232-A

RA 78 728 DIN rail socket with screw-type terminals, 4 pole

F0139-A

Retaining clip PT 28 800





Dimensions in mm

Technical data	
Rated current 7 A	
Rated voltage	250 Vac
Dielectric strength coil/cont.	>3000 V_{rms}
Insulation cat. (VDE 0110b)	C / 250 Vac
Ambient temperature	-45...+70 °C
Protection category	IP 20
Protection against accidental contact meets	VBG 4
Wire cross section	2 x 2.5 mm²
with bootlace crimp	2 x 1.5 mm²
Terminal torque	0.5 Nm
max.	0.7 Nm
Packaging unit	25 pcs.

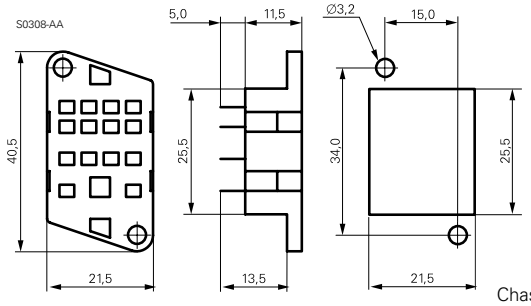
Accessories Miniature Relay PT

and similar design: relay heights 29 / 34.6 / 35.2 / 36.6 / 37.6mm

Dimensions in mm
View on solder pins

PT 78 600 Socket with solder terminals, 4 pole

F0132-A



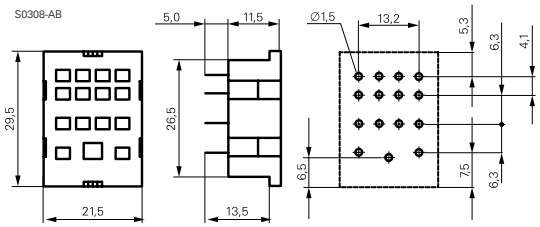
Chassis cut-out

Technical data	
Rated current	10 A
Rated voltage	250 Vac
Dielectric strength coil/cont.	>1500 V_{rms}
Ambient temperature	-40...+70 °C
Packaging unit	25 pcs.

PT 78 604 4 pole
PT 78 603 3 pole
PT 78 602 2 pole

Socket with PCB terminals

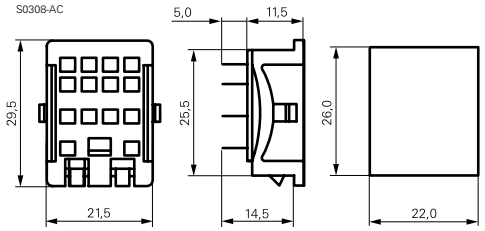
F0133-A



Technical data	
Rated current	10 A
Rated voltage	250 Vac
Dielectric strength coil/cont.	>1500 V_{rms}
Ambient temperature	-40...+70 °C
Packaging unit	25 pcs.

PT 78 601 Socket with solder terminals, 4 pole

F0134-A



Chassis cut-out

Technical data	
Rated current	10 A
Rated voltage	250 Vac
Dielectric strength coil/cont.	>1500 V_{rms}
Ambient temperature	-40...+70 °C
Packaging unit	25 pcs.

PT sockets	
Type	
PT 78 600	Socket with solder terminals, 4 pole
PT 78 602	Socket with PCB terminals, 2 pole
PT 78 603	Socket with PCB terminals, 3 pole
PT 78 604	Socket with PCB terminals, 4 pole
PT 78 601	Socket with solder terminals, 4 pole

Accessories for PT 78 600, PT 78 601, PT 78 602, PT 78 603, PT 78 604	
Type	
PT 28 802	Metal retaining clip PT, relay height 29 mm
ZG 28 800	Metal retaining clip, relay height 36 mm

Accessories Multimode Relay MT

and similar design: octal / undecal

F0235-A

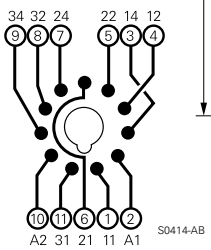
Features

- Snap-on mounting on DIN-rail
- Screw mounting
- Pozidrive screws with rising clamp terminals
- Logical layout of input-/output connections
- White marking area

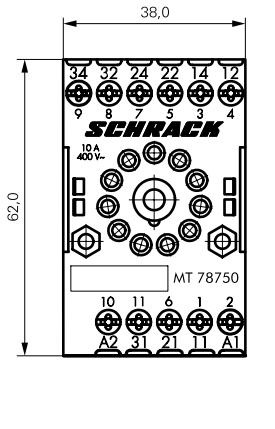
Dimensions in mm

DIN-rail sockets with screw-type terminals

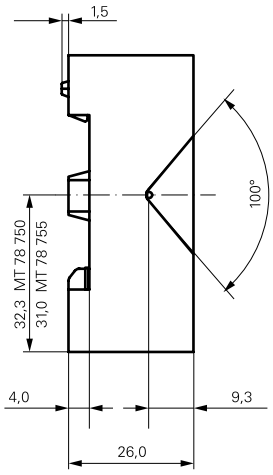
F0103-A



S0414-AB



S0311-BA



YMR 78 700 MT3 DIN-rail socket with screw-type terminals 11pole
YMR 78 701 MT2 DIN-rail socket with screw-type terminals 8pole

cULus

Technical data	
Rated current	10 A
Rated voltage	400 Vac
Dielectric strength coil/cont.	>3500 V_{rms}
Insulation cat. (VDE 0110b)	C / 400 Vac
Tracking resistance	CTI 300
Ambient temperature	+80 °C
Protection category	IP 20
Protection against accidental contact meets	VBG 4
Mounting	DIN 50024 / 22
Wire cross section	2 x 2.5 mm^2
Terminal torque	0.8 Nm
max.	1.0 Nm
Packaging unit	50 pcs.

DIN-rail sockets with screw-type terminals	
Type	
YMR 78 700	MT3 DIN-rail socket with screw-type terminals 11pole
YMR 78 701	MT2 DIN-rail socket with screw-type terminals 8pole

Accessories for YMR – Socket	
MT 28 800	Metal retaining clip MT

Accessories Multimode Relay MT

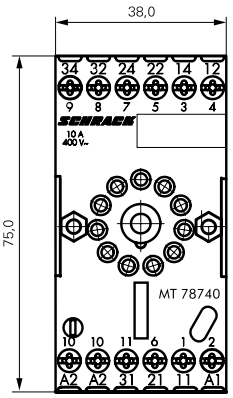
and similar design: octal / undecal

Dimensions in mm

MT 78 740 MT3 DIN-rail socket with screw-type terminals 11 pole

MT 78 745 MT2 DIN-rail socket with screw-type terminals 8 pole

F0200-A



S0366-A

Technical Data	
Rated current	10 A
Rated voltage	400 Vac
Dielectric strength coil/cont.	>3000 V_{eff}
Ambient temperature	+80 °C
Protection category	IP 20
Protection against accidential contact meets	VBG 4
Mounting/DIN rail	DIN50022
Wire cross section	2 x 2,5mm²
Terminal torque	0.8 Nm
Packaging unit	10 Stk.

DIN-rail socket with screw-type terminals

Type	
MT78 740	DIN-rail socket with screw-type terminals, 11 pole
MT78 745	DIN-rail socket with screw-type terminals, 8 pole

Socket system MT 78 740 and MT 78 745

- 8/11 pin socket for MT2 / MT3
- Double A2 screw for simple further connection of coil supply

Accessories for MT 78 740, MT 78 745

Type	
MT 28 800	Metal retaining clip MT

LED and Protection modules for MT 78 740, MT 78 745

Type	
MTM T0 0A0	Protection diode 1N4007
MTM U0 524	RC-network 6...24 Vac
MTM U0 730	RC-network 110...230 Vac

LED	
MTM L0 024	red LED 24 Vac / Vdc
MTM G0 024	green LED 24 Vac / Vdc
MTM L0 730	red LED 110...230 Vac / Vdc
MTM G0 730	green LED 110...230 Vac / Vdc

F0201-A

F0202-A

Function modules for MT 78 740, MT 78 745

Type	
MTM Z0 W00	Delay ON
MTM F0 W00	Multifunction

F0203-A

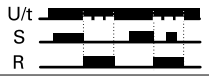
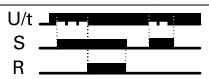
F0204-A

Technical data - Function modules

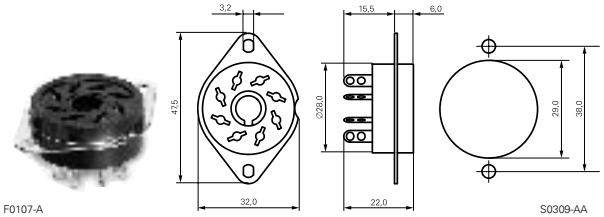
Nominal voltage	24...240 Vdc / Vac
Mains frequency	48...63 Hz
Precision of time setting	± 0,5 %
Readiness for repetition	≤ 0,5 % or 5 ms
Influence of temperature	≤ 0,1 %/°C
Time range switchable	0,05s...240h in 8 ranges
Ambient temperature	-25...+55 °C

Accessories Multimode Relay MT

and similar design: octal / undecal

Function modules for MT 78 740, MT 78 745	
Function	
Delay ON	
Delay OFF	
single shot leading edge	
single shot trailing edge	
Delay ON triggerd by signal contact	
single shot	
flasher starting with pause	
flasher starting with pulse	

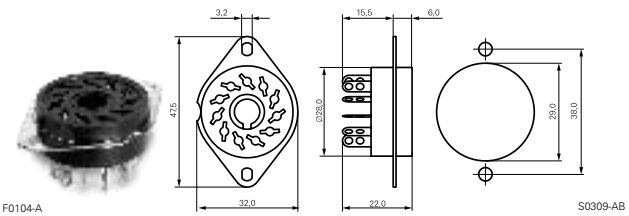
MT 78 612 Socket 8 pole with solder terminals



F0107-A S0309-AA

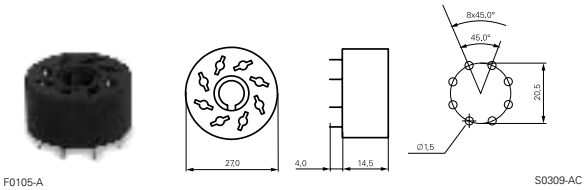
MT 78 613 Socket 11 pole with solder terminals

Dimensions in mm
View on solder pins



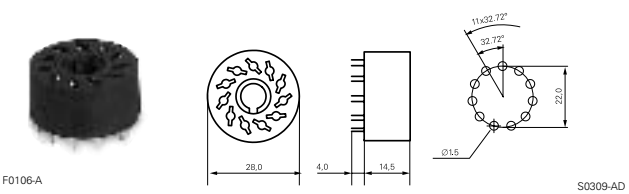
F0104-A S0309-AB

MT 78 602 Socket 8 pole with PCB terminals



F0105-A S0309-AC

MT 78 603 Socket 11 pole with PCB terminals



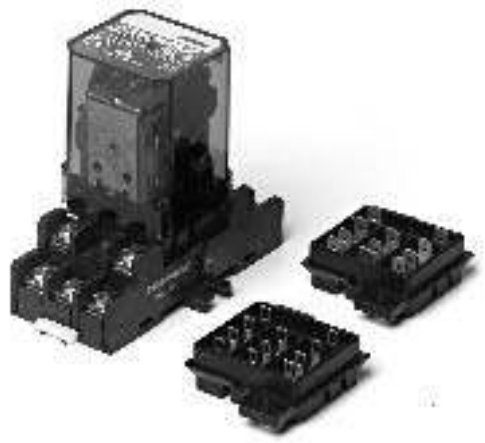
F0106-A S0309-AD

Sockets with solder and PCB terminals	
Type	
MT 78 612	Socket 8 pole with solder terminals
MT 78 613	Socket 11 pole with solder terminals
MT 78 602	Socket 8 pole with PCB terminals
MT 78 603	Socket 11 pole with PCB terminals

Technical data	MT78602...MT78613
Rated current 10 A	
Rated voltage	250 Vac
Dielectric strength coil/cont.	>2500 V_{rms}
Ambient temperature	-40...+70 °C
Packaging unit	25 pcs

Accessories Power Relay RM

2 / 3 pole, 10 / 16 A



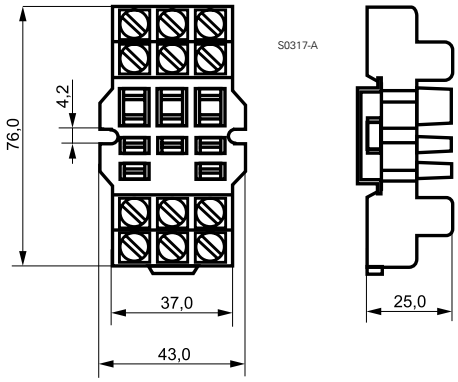
F0237-A

RM Sockets with screw-type terminals

RM 78 704 Socket with screw-type terminals

Dimensions in mm

F0113-A

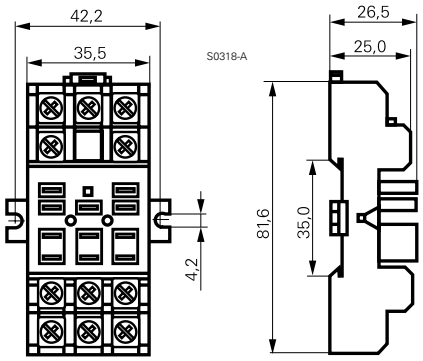


S0317-A

Technical data	
Rated current	16 A
Rated voltage	380 Vac
Dielectric strength coil/cont.	>2500 V_{rms}
Ambient temperature	-40...+50 °C
Terminal torque	0.8 Nm
max.	1.2 Nm
Packaging unit	100 pcs.

RM 78 705 Socket with screw-type terminals

F0114-A



S0318-A

Technical data	
Rated current	16 A
Rated voltage	250 Vac
Dielectric strength coil/cont.	>2500 V_{rms}
Ambient temperature	-40...+40 °C
Terminal torque	0.8 Nm
max.	1.2 Nm
Packaging unit	100 pcs.

Socket with screw-type terminals	
Type	
RM 78 704	Socket with screw-type terminals
RM 78 705	Socket with screw-type terminals

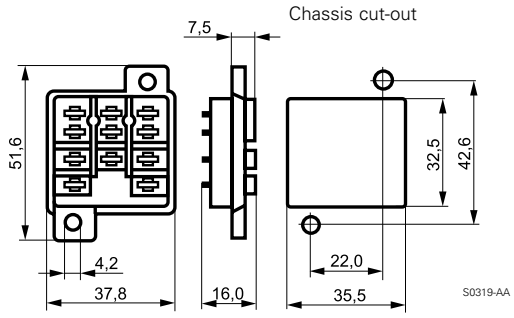
Accessories Power Relay RM

2 / 3 pole, 10 / 16 A

Dimensions in mm
View on solder pins

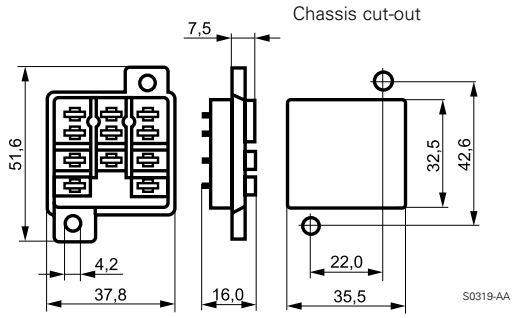
RM 78 700 Socket with Faston terminals


F0110-A



RM 78 701 Socket with solder terminals

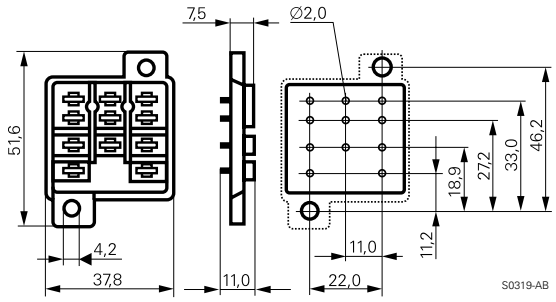

F0111-A



RM 78 702 Socket with PCB terminals

300 Vac / 10 A


F0112-A



Sockets	
Type	
RM 78 700	Socket with Faston terminals
RM 78 701	Socket with solder terminals
RM 78 702	Socket with PCB terminals

Accessories for RM 78 700, RM 78 701, RM 78 702	
Type	
RM 28 802	Metal retaining clip RM

Definitions

AC-coil
Relays for direct energization with AC supply. The data is given for a 50 Hz supply.
Unless otherwise stated, the AC-coils may be used with 50 and 60 Hz supply. For 60 Hz data please contact our application support.

Ambient temperature
The temperature in the vicinity of the relay.The minimum ambient temperature is the miniumum operating temperature, the maximum ambient temperature is the maximum operating temperature for the use of the relay. This temperature should not be exceeded. Ambient temperature range according to IEC 61810-1.

Approvals
The approvals confirm that the relay corresponds to the respective regulation for electrical components and equipment.The approvals are quoted for the respective relay types. However, they do not always refer to the entire spectrum of types of a relay.

	BEAB	British Electrotechnical Approvals Board, England
	CECCE	VDE-Prüfstelle Offenbach als nationale Überwachungsstelle, Deutschland
	CSA	Canadian Standards Association, Kanada
	DEMKO	Danmarks Elektriske Materielkontrol, Dänemark
	KEMA	Naamloze Vennootschap tot Keuring van Electrotechnische Materialien, Niederlande
	LLOYD's	Lloyd's Register of Shipping
	NEMKO	Norges Elektriske Materiellkontroll, Norwegen
	ÖVE	Österreichischer Verband für Elektrotechnik, Österreich
	SEMKO	Svenska Elektriska Materiellkontrollanstalten AB, Schweden
	SETI	Sähkötarkastuskeskus Elinspektionscentralen, Finnland
	SEV	Eidgenössisches Starkstrominspektorat, Schweiz
	TÜV	Technischer Überwachungs-Verein, Deutschland
	UL	Underwriters Laboratories, Inc., USA; UL Component Recognition Mark for the United States
	UL	UL Component Recognition Mark for Canada
	UL	UL Component Recognition Mark for the United States and Canada
	VDE	VDE-Prüfstelle, Deutschland (Gutachten mit Fertigungsüberwachung)

Bistable relay, switching characteristics
In a bistable relay, the contacts remain in the last switching position after the input voltage is disconnected.

Bistable, polarized relay
A polarized bistable relay adopts one switching position on energizing in a particular direction and the other switching position when the energizing is in the opposite direction. In a bistable relay with one winding, the opposite energizing is created by a voltage with opposite polarity being applied to the same winding.
In a bistable relay with two windings, the opposing energizing is created by a voltage being applied to the second winding with opposite winding sense.

Bistable, remanent relay (remanence relay)
A remanent, bistable relay adopts a particular switching position at an energizing direct current in any direction and is held in this position by the remanence in the magnetic circuit, i.e. through the magnetization of parts of the magnetic circuit. The contacts shift to the other switching position on a small energizing current of limited amplitude in the opposite direction. This demagnetizes the magnetic circuit.

Bounce
An unintentional phenomenon that can occur during the making or breaking of a contact circuit when the contact elements touch successively and separate again before they have reached their final position.

Bounce time
The time (typ.) from the first to the last closing or opening of a relay contact. The indicated times are for energization with nominal voltage (without any components in series or parallel to the coil) and at reference temperature.

Break contact
A contact that is closed in the rest state of the relay and open in the operating state.

Bridging contact
Compound contact with two simultaneously operating make contacts connected in series.

Category of protection (IEC61810)
The 'Relay Technology Categories' describe the degree of sealing of the relay case or its contact unit:

RT 0: unenclosed relay
Relay not provided with a protective case

RT I: dust protected relay
Relay provided with a case which protects its mechanism from dust

RT II: flux proof relay
Relay capable of being automatically soldered without allowing the migration of solder fluxes beyond the intended areas. These are the contacts, movable parts of the magnetic system and their immediate environment.

RT III: wash tight (washable) relay
Relay capable of being automatically soldered and subsequently undergoing a washing process to remove flux residues without allowing the ingress of flux or washing solvents.
The test to evaluate the sealing of the case for wash tight relays and is performed according to the IEC 68-2-17, Qc test.

NOTE - In service this type of relay is sometimes vented to the atmosphere after soldering or washing process; in this case the requirements with respect to clearances and creepage distances can change.

RT IV: sealed relay

RT V: hermetically sealed relay

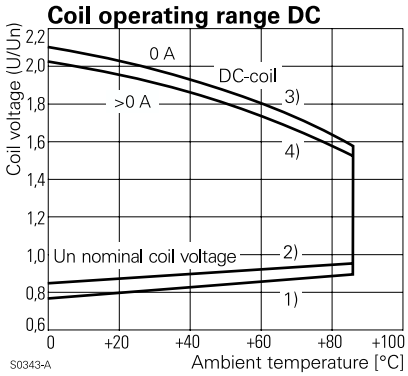
Definitions

Changeover contact
Compound contact consisting of a make contact and a break contact with a common terminal. On changing the switch position, the contact previously closed opens first followed by the closing of the contact that was previously open.

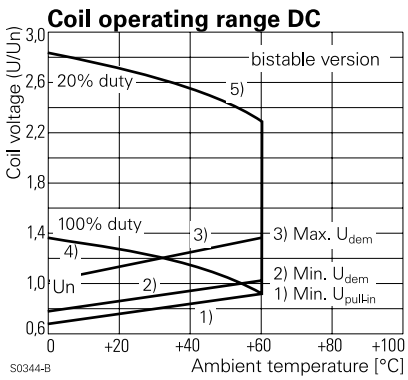
Clearance distance
Shortest distance in air between two conductive elements.

Coil operating range
Permissible range for the energizing voltage as function of the ambient temperature. The operating range is defined by the maximum voltage and the operate-/minimal voltage U_{min} (coil without preenergization) and/or the operate-/minmal voltage U_l (preenergized coil).

Coil operating range for monostable relays with DC- or AC-coil:
curve 1: operate-/minimal voltage U_0 (without preenergization)
curve 2: operate-/minimal voltage U_1 (preenergized coil)
curve 3: maximum voltage U_2 at contact current = 0A
curve 4: maximum voltage U_2 at rated contact load I_{nom}



Coil operation range for bistable relays (remanence version)
curve 1: operate voltage at coil temperature equal to ambient temperature (no preenergization or pulsed operation)
curve 2: minimum reset-/demagnetization voltage
curve 3: maximum reset-/demagnetization voltage at full contact load
curve 4: maximum voltage at full contact load
curve 5: maximum voltage at full contact load and pulsed operation (duty cycles)



Coil resistance
Electrical resistance of the relay coil at reference temperature.

Contact configuration
According to the different switching functions of the relay contacts the various contact configurations, design and description are specified in DIN 41020. See:
- make contact (N/O)
- break contact (N/C)
- changeover contact (C/O)

Contact	Reference D	GB	USA	Circuit diagr.
N/O contact make cont.	1	A	SPST-NO	
N/C contact break cont.	2	B	SPST-NC	
C/O contact changeover c.	21	C	SPDT	
Bridging N/O	1	X	SPST-NO	
Bridging N/O/ Bridging N/C		X	DM-DB	

Contact material
The list gives an overview of the most important plating- and contact materials.The switching capacity of the contacts and the respective electrical endurance depends not only on the contact material but also to a high degree on the relay design. Decisisve for the application therefore is the optimal combination of the mechanical system and the contact material. The characterisitics for certain relay types cannot be transferred to other designs.

1) Plating materials:
Fine gold
- best corrosion resistance, not used as solid material because too soft, high tendency towards cold-welding
- gold platings ≤ 1 µm (hv), only as storage protection, no protection against aggressive atmosphere.

Hard gold / gold plated (htv)
- very good corrosion resistance, low and stable contact resistance at lowest loads, low tendency to cold welding
- dry-circuit switching (switching without current/voltage), recommended range of application 1 V...60 V, 1 mA...100 mA

Definitions

2) Contact materials:
Fine-grain silver AgNi0,15 / AgNi0.15 gold flashed
- relatively low contact resistance, low resistance against aggressive atmosphere
- universally applicable in medium and low load range, especially in DC-circuits, ≥ 12 V, 10 mA

Silver-Nickel AgNi90/10
- high resistance against electrical wear, low welding tendency, higher contact resistance than AgNi0,15
- circuits with medium to high loads, DC- and AC-circuits, range of application ≥ 12 V, 10 mA

Silver-Cadmium-Oxide AgCdO
- low welding tendency, high wear resistivity
- particularly suited for switching of inductive loads, AC-circuits, ≥ 12 V, 100 mA

Silver-Tin-Oxide $AgSnO_2$
- low welding tendency, very high wear resistivity with heavy loads, low material transfer
- circuits with high requirements to make- and break currents, DC- and AC loads, ≥ 12 V, 100 mA

Tungsten W
- highest melting point, high wear resistivity, for high switching rates and low ON-time
- as pre-contact in circuits with highest make- and break loads, ≥ 60 V, 1 A

Contact resistance
Electrical resistance between the relay terminals of a closed contact, measured with indicated measuring current and voltage. The specified contact resistance is reached reliably only above a particular load. Considerably increased contact resistances can occur with smaller loads.
According to IEC 61810-7 the following measurement parameters based on the actual switching load are applied:

Contact type
See
- single contact

	Load		Measurement	
Category	V	A	V	A
cat. 0	0.03	0.01	0.03	0.01
cat. 1	0.03...60	0.01...0.1	0.1	0.01
cat. 2	5...250	0.1...1	24	0.1
cat. 3	5...600	0.1...100	24	1.0

- twin contact
- bridging contact
- forcibly guided contacts

Creepage distance
Shortest distance on the surface of an insulating material between two conductive elements.

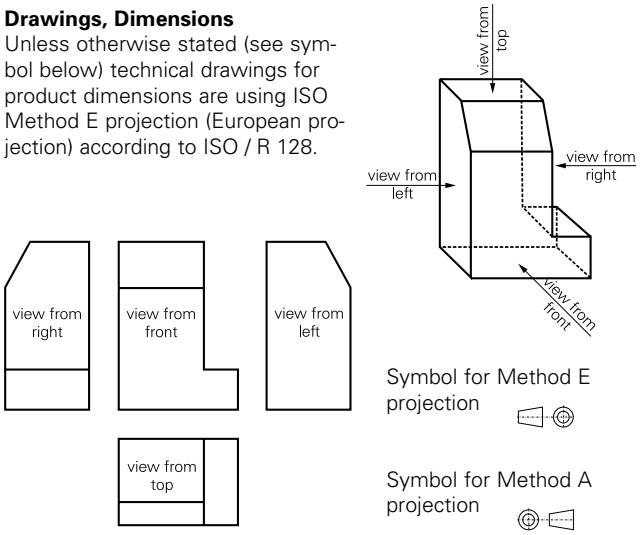
C/O contact
See > changeover contact

Dielectric strength / dielectric test voltage
Voltage (rms value in AC voltage, 50Hz 1min) the insulation can withstand between relay elements that are insulated from one another.

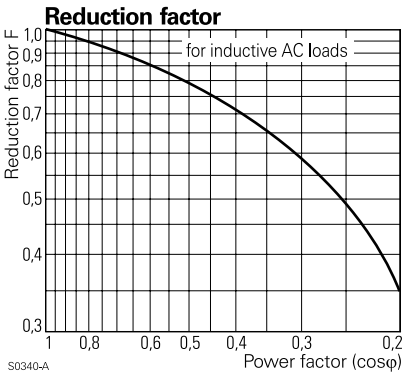
Dust-proof relay
Relay with a case to protect against dust penetration.

Duty cycle
Ratio of the duration of energization to the total period of intermittent duty.

Drawings, Dimensions
Unless otherwise stated (see symbol below) technical drawings for product dimensions are using ISO Method E projection (European projection) according to ISO / R 128.



Electrical endurance/contact endurance/electrical life
Number of switching operations of a relay with electrical contact load defined under specified conditions without contact fault. The reference values specified for the endurance apply, unless otherwise specified, to a resistive load.The electrical endurance is reduced with an inductive ac load as a function of the power factor cosφ (φ is the phase angle between the voltage and current. See reduction factor diagram.



Electrical life
See > Electrical endurance

Definitions

Flammability according to UL
Data of the flammability class according to the UL 94 (Underwriters Laboratories, Inc., USA) specification.This test for technical plastic is widespread. According to the burning characteristics 4 incendiary classes are classified: UL 94 HB, V-2, V-1, V-0.

flux proof/suitable for processing on soldering lines
See 'Category of protection (IEC 61810) - RT II
Relays for processing on soldering lines; a suitable sealing of the relay on the printed circuit board side prevents any flux entering the case.

Forcibly guided contacts
Contact configuration in which break and make contacts within the complete spring set are never closed at the same time even in case of malfunction as a result of contact welding. These relays are implemented in the control of safety technology for the protection against damage to persons or objects.

Immersion cleanable / wash tight
See 'Category of protection (IEC 61810)' - RT III
Relays that can be cleaned, lacquered or cast-in together with the printed circuit board after soldering. The washing requires a suitable solvent.
The term "immersion cleanable / wash tight" is not identical with "hermetically sealed"!

Insulation according to IEC 60 664
Data for insulation co-ordination on:
- rated voltage (the voltage value above which the creepage distance is measured)
- pollution degree (classification of the pollution from external materials that affect the insulation)
- overvoltage category (classification of electrical equipment (here: relays) to the overvoltage to be expected)

Insulation according to VDE0110b (2/79)
Data for insulation co-ordination on:
- insulation category (classification of equipment according to environment and utilization conditions)
- reference voltage

Insulation resistance
Electrical resistance (initial condition) measured by applying a DC voltage of 500 V between two elements of a relay that are insulated from one another.

Limiting continuous current / continuous thermal load
The highest value of the current (effective value for alternating current) that the previously closed output circuit can permanently carry under specified conditions.

Make contact
A contact that is open in the rest state and closed in the operating state.

Make current / max. make current
The current a relay can switch on closing contacts under specified conditions. Unless otherwise stated the data refers to the current for a duration of max. 4s with a duty cycle of 10%.

Max. DC load breaking capacity / Load limit curve
Switching of loads at switching voltage and switching current below the load limit curve can be switched off reliably, i.e. the arc is extinguished (max. arc duration 10 ms at resistive load). The load limit curve is affected in both position and shape by the contact materials and relay construction (contact distance, break speed of the contacts, etc.). No statement on the electrical endurance is connected with these curves.

Maximum breaking voltage DC / AC
Maximum voltage that may occur between the switching contacts before closing or after opening the contact. (DC refers to direct current; AC refers to alternating current)
Data given for AC refer to a grounded 3-phase supply with 230 / 400 Vac.

Maximum voltage U_2 (coil).
The highest permissible input voltage at the reference temperature at which the relay, with continuous energization, heats up to its max. permissible coil temperature.

Mechanical endurance
Number of switching operations without contact load during which the relay remains within the specified characteristics.

Minimum switching power
Product of the switching current and switching voltage for reliable switching. Low contact resistance is reached reliably only above a particular load. Considerably increased contact resistances can occur with smaller loads.

Monostable relays, switching characteristics
A relay is called monostable when its contacts return automatically to the rest position after the input voltage is disconnected.

Monostable, neutral relay, non-polarized relay
A neutral, monostable relay operates independently of the direction of the energizing direct current.

Monostable, polarized relay
A polarized, monostable relay only operates in a specific direction of energization. It then adopts the operating state.

Mounting position
Normally the relay can be mounted in any position if no restricting specifications are given.

Nominal power
Power consumption of the coil at nominal voltage and nominal coil resistance.

Nominal voltage (coil), Rated coil voltage
Nominal voltage at which the relay displays the operating characteristics.

Non-release voltage
The value of the input voltage at which a monostable relay does not release.

N/C contact
See > break contact

N/O contact
See > make contact

Definitions

Operate
Process in which a relay shifts from the rest state to the operating state.

Operate category
According to IEC 61810.

Operate power
Coil power at which the relay operates.

Operate time
The time interval that elapses from energizing a relay in the rest state with the nominal voltage (pulse or square signal) to the moment when the last output circuit is closed or opened (bounce time not included).

Operate voltage/Minimum voltage U_1, preenergized
The lowest permissible input voltage at which the relay operates reliably at the reference temperature even after continuous energization (preenergizing) and brief de-energizing.

Operate voltage / Minimum voltage U_0, without preenergizing
Minimum permissible voltage at the winding at which the relay operates, for a coil temperature of the reference temperature (20°C coil temperature without preenergizing).

Operation
Single activation and release of a relay.

Packaging unit
Minimum delivery quantity (e.g. plastic bar) and quantity per box.

Plug-in relays
Relays that are held in the socket by flat plug-in terminals (round pins for MT) where electrical contact is established simultaneously.

Print relays
Relays designed for soldering into printed circuits.

Protection category / sealing
For definition of relay protection see 'Category of protection (IEC 61810) - Relay Technology Categories

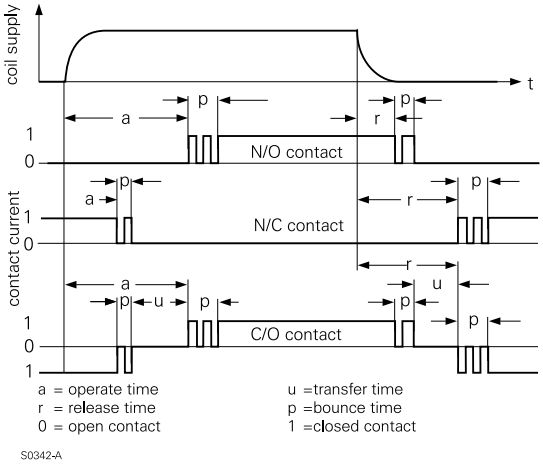
Rated coil voltage
Nominal voltage at which the relay displays the operating characteristics.

Rated current (contacts)
Current a relay can switch on and off under specified conditions.

Rated voltage (contacts)
Voltage between the switching contacts before closing or after opening of the contact. (DC refers to direct current; AC refers to alternating current)

Rated voltage (insulation)
The reference voltage for the measurement of the creepage distance according to IEC 60 664-1 and VDE0110b.

Relay cycles (dynamic response)
Due to the self induction of the coil and the inertia of the parts to be moved, on activating a relay the operations do not take place suddenly. The function diagram below shows the different cycles for the most important relay configurations of undelayed power relays.The cycles specified apply to energizing with nominal voltage (without any components in series or parallel to the coil) and at the reference temperature.
- operate time
- release time/reset time
- bounce time
- transit time
- minimum energization time



Relay Technology Categories
The 'Relay Technology Categories' describe the degree of sealing of the relay case or its contact unit. See 'Categories of protection'

Release
Process in which a monostable relay shifts from the operating state back to the rest state.

Release time
The time interval (typ.) that elapses from the point of time at which a monostable relay in the operating state has the nominal voltage disconnected to the point of time at which the last output circuit has closed or opened (not including the bounce time). The indicated times are valid for energization with nominal voltage (without any components in series or parallel to the coil) and at reference temperature.

Release voltage
The input voltage at which a monostable relay returns to the rest state at the reference temperature.

Reset
Process in which a bistable relay returns from the operating state back to the rest state.

Definitions

Reset time
The time interval (typ.) that elapses from the point of time at which a bistable relay in the operating state has the nominal voltage applied in the opposite direction to the point of time at which the last output circuit has closed or opened (not including the bounce time).

Reset voltage
The lowest input voltage at which a bistable relay shifts from the operating state into the rest state at the reference temperature.

Rest state
Switch position of a monostable relay in the unenergized state. In bistable relays this is the switch position specified by the manufacturer. The contact position is not defined at delivery.

Safety relays
The compliance with regulations for the safety of persons and material is imperative in our technical world. National and international regulations take various risks into account. These safety standards also make demands on components which share with their function the safety level of a plant, machine or the equipment. For safety relays the demand for forcibly guided contact system according ZH1/457, issued by the professional association applies; the contacts have to be linked mechanically in a way, that N/O and N/C contacts may not be closed at the same time. It has to be ensured that over the entire life and even in case of malfunction (e.g. contact welding) the contact gap will be at least 0.5mm. If specified they also comply with the wider requirements according to prEN 50205 "relays with forcibly guided contacts"

Shock resistance (destruction)
This test is used to evaluate the resistance of the relay to mechanical shocks such as those that could occur in transport or during operation (no permanent damage to the relay). This test is performed according to the
IEC 68-2-27, Ea test.

Shock resistance (function)
This test is used to evaluate the resistance of the relay to mechanical shocks such as those that could occur in transport or during operation (no opening of closed relay contacts or closing of open relay contacts with a duration >10 µs is allowed to occur during the test). This test is performed according to the IEC 68-2-27, Ea test.

Single contact
Contact system with one contact piece per contact spring.

Surge voltage / test surge voltage
Amplitude of a voltage impulse of short duration with a specified impulse form and polarity that is applied to test insulation paths in the relay.

Switching current
Current a relay can switch on and off under specified conditions.

Switching power
Product of the switching current and switching voltage (in W for direct current, in VA for alternating current).

Switching rate
Number of operations per unit of time.

Switching voltage
Voltage between the switching contacts before closing or after opening of the contact. (DC refers to direct current; AC refers to alternating current)

Tracking resistance
Evaluation of insulating materials by determining their creepage distance formation, specified by the so-called comparative number of creepage formation (CTI) according to IEC 112.

Twin contact
A compound contact consisting of two simultaneously operating make contacts with a common contact spring. Twin contacts increase the contact reliability considerably, especially when switching low currents and voltages (dry circuits).

Vibration resistance (function)
This test is used to evaluate the resistance of the relay to harmonic mechanical oscillations such as those that could occur in transport or during operation (no opening of closed relay contacts or closing of open relay contacts with a duration >10 µs is allowed to occur during the test). This test is performed according to the IEC 68-2-6, Fc test.

Safety Relays / Definitions

Relays with forcibly guided contacts

General information

Relays with forced guidance contacts play a decisive role in avoiding accidents on machines and in systems. Safety control circuits enable to switch into the fail safe state. Forcibly guided contacts monitor the function of the safety control circuits.
For this safety function, all the assumed faults that can occur must already have been taken into consideration and their effects examined. Standard EN 50205 "Relays with forcibly guided contacts" contains current internationally-defined design requirements. Relays with forcibly guided contacts that comply with EN 50205 are also referred as "safety" relays.

Function

Power relays with forcibly guided (linked) contacts:
Power relays with at least one break contact and at least one make contact designed that by mechanical means make and break contacts can never be simultaneously in the closed position.
Contact gaps shall never be less than 0.5 mm over the operating life, not only under normal operating conditions, but also when a fault occurs.
This requirement allows the respective exclusive-or contact to detect the fault of a contact to open. For example, the welding of a make contact is indicated by the non-closing of the break contact when the energization is switched off.

To fulfill the specifications of the standard, the assumed faults must be considered:

Assumed fault	Effect
Failure of the contact to open due to welding	The failure of any make contact to open has the effect that none of the break contacts close even when the relay is not energized. The failure of any break contact to open has the effect that none of the make contacts close when the relay is energized.
Failure of the contact to open due to failure of the drive	The drive has no effect on the forcibly guided contact operation.
Breakage of the contact spring	Simultaneous closing of the break and make contacts is not possible even as a result of breakage. Completely insulated contact chambers (SR2, SR4, SR6) or barriers (SR2M) guarantee a contact gap of 0.5 mm.

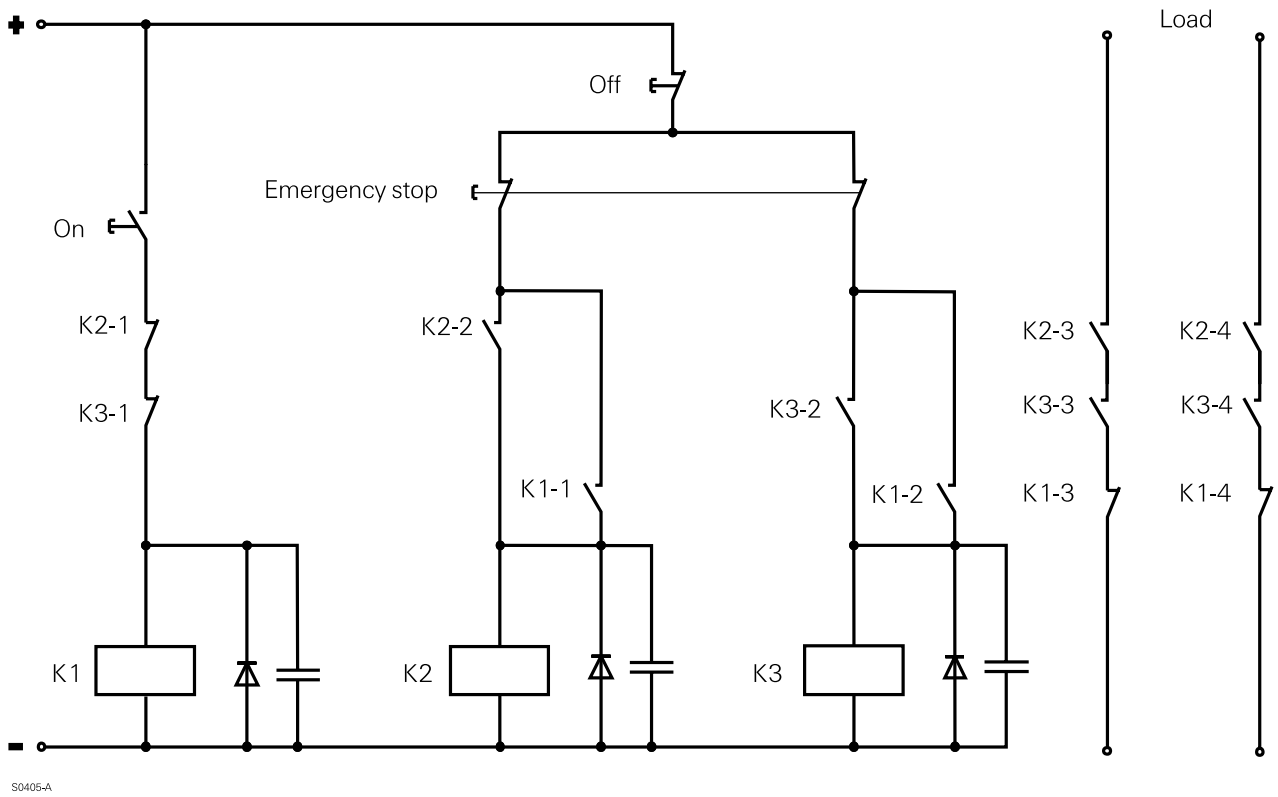
Safety Relays / Definitions

Application example
The configuration of safety control circuits is basically only possible with specified fault conditions. Safety relays have the characteristic that make and break contacts can never both be closed at the same time.

The following circuit diagram shows an emergency stop control circuit consisting of three 4-pole safety relays.

The first fault to occur
- does not cause the safety function to fail because more components are used than required for the circuit to function (redundancy).
- prevents an restart and can be detected as a result (self monitoring)

Operation
- Closing the "ON" switch causes the K1 relay to be pulled in
- The K2 and K3 relays are energized via the make con-tacts K1-1 and K1-2 and hold themselves via K2-2 or K3-2
- The break contacts K2-1 and K3-1 cause the drop-out of K1 where the load circuit is released via the break con-tacts of K1-3 or K1-4.



Fault analysis (examples):

Type of fault	Is there any danger arising from the fault?	Is a restart possible?
Failure of contact K2-3 to open	No, K3-3 opens when the emergency stop switch is actuated	No, K2-1 and K2-3 cannot be closed at the same time (fault excluded by forcibly guid). "ON" button does not cause K1 to close
Failure of contact K1-3 to open	No, K2-3 and K3-3 open when the emergency stop switch is actuated	No, K1-1 and K1-2 cannot close due to closed K1-3. K2 and K3 are not energized

Processing

Mounting
Unless otherwise stated the relay can be mounted in any position. The relays can be further processed in all of the usual commercial soldering and cleaning plants.

Insertion
No pressure should be exerted on the terminal pins after the relay has been inserted in the printed circuit board. After insertion in the printed circuit board, the terminal pins should not be bent in order to fix them. Bending the terminal pins in relays sealed against washing can damage the sealing and could alter the relay parameters. However, if fixing must be carried out before soldering, use a pressure plate or similar.

Fluxing
The fluxing process should be set up so that the flux wets only the underside of the printed circuit board. The flux should only be visible as foam flux through any open perforations in the printed circuit board. If the printed circuit board is flooded by foam flux, bursting flux bubbles can lead to contamination in open relays and, consequently, to failures. To protect against corrosion, no acidiferous flux should be used.The recommended flux types are 1.1.3, 1.2.3 or 2.2.3 according to DIN EN 29454 T.1.

Preheating
In the normal preheating of flux, the temperature of the upper surface of the printed circuit board should not exceed 100°C. Ensure that any not completely dry flux exploding on being submerged in the solder wave does not penetrate the insides of open relays.

Soldering
PIN version
The relays in the PIN version are soldered according to the S-Sn60Pb40 or S-Sn63Pb37 solder types in accordance with DIN EN 29453. The solder bath temperature should be max. 260°C with a solder duration of approx. 3 s.

SMD version
The soldering processes approved for relays of the SMD version are condensation soldering (vapour phase), infrared soldering (radiation and/or convection) and full wave soldering.

Approved Soldering Techniques	Max. sold. duration	Max. sold. temp.
Condensation soldering (vapour phase)	40 s	215°C
Infrared soldering	40 s	215°C
Full wave soldering	10 s	260°C

Refer to the recommendations of CECC 00802 for the complete soldering profile.

Manual soldering
For manual soldering, we recommend a soldering temperature of 300 to 350 °C for a maximum soldering time of 2 s. The recommended solder type is pipe solder 1 DIN 8516-LSnPb zh/F-SW 32 to 34 (1 mm , 2.5 percentage by weight flux portion).

Cooling
The thermal loading resulting from the soldering process can be reduced at the end of the process by cooling.

Cleaning
We recommend avoiding washing processes in order to protect the environment. The fluxes we specify render a wash process unnecessary. If cleaning is required for other reasons, the following points must be observed independently of the washing process:

- the printed circuit boards must be washed immediately after the soldering process!
- the washing process must be set up so that any accumulation of washing fluid inside the relay is avoided!
- the individual wash stations must be separate from one another to prevent cross-contamination!
- after the final washing process, the printed circuit boards must be cleaned again using a clean washing medium!
- After washing, compressed air should be used to blow off the printed circuit board to speed up the drying process.

Protective lacquering
For the protective lacquering of the mounted printed circuit boards, we recommend single-component lacquer that is applied by immersion.
The maximum drying temperature should be 70 °C.