



ELESTA

RELAYS WITH FORCIBLY GUIDED CONTACTS

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RELAYS, RELAY ACCESSORIES AND RELAY MODULES





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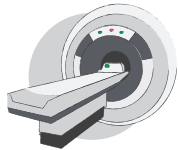
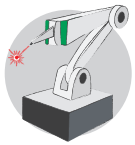


CONTENT

About us	2
Our model series	3
Application notes	11
Relays with forcibly guided contacts	13
SISF Series	13
SIS Series	15
SIF Series	23
SID4 Series	26
SGR282 ZK Series	27
SIM Series	28
SLR4 Series	31
SIR Series	32
SIP6 Series	39
Relay modules	40
SMD Series	40
SMF Series	41
Relay accessories	44
Mounting rail socket	44
PCB sockets	49



ABOUT US



Until the 1980s, ELESTA stood for Swiss innovation in electromechanics and electronics. When the new ELESTA relays GmbH was founded in March 1997 from the inheritance of the "old" ELESTA Elektronik AG, the company concentrated on the production of relays with forcibly guided contacts. Later, the business areas for customised development and production services as well as sensor technology were added.

What started in 1997 with about a dozen employees and the production of a few relays became a success story. In the middle of Europe, one of the most innovative relay manufacturers in the world has successfully established itself.

25 years later, ELESTA relays GmbH is now called ELESTA GmbH and the range of services now includes not only relays with forcibly guided contacts with 25 basic series but also relay modules and encompasses the development and production of customer-specific sensors for functional safety.

Wherever there is a risk of accidents, whether on a track crossing, a lift, robots, medical lasers, X-ray equipment or construction cranes, to name just a few applications, ELESTA relays are used as the centrepiece in functional safety applications. The

special feature of these relays is the forced guidance. This design feature of the relay connects the relay contacts to each other in such a way that if one contact is welded, all other counter-functional contacts can no longer close. This makes it very easy and safe to monitor the load and feedback circuits.

The fact that innovations are still possible in this field of technology is proven, among other things, by the novel double armature relay SID with two independent forcibly guided contact sets according to IEC 61810-3 type A. This new development achieves a great savings potential in all technical and ecological areas, combined with an improvement in the reliability of the entire control architecture.

You can also download all data sheets at www.elesta-gmbh.com

OUR MODEL SERIES

COMPACT & SAFE

SIS2, SIS3, SIS4, SIS6

- Small dimensions:
maximum height 16,5 mm
- Wide excitation voltage range
- Low nominal coil power
- Notched crown contacts for very high contact reliability
- Coils can be designed for railway application according to EN 50155
- High shock and vibration resistance
- Switching current range: 3 mA, ..., 6 A
- Protection class: RT III

Areas of application:

- Robotics
- Lift technology
- Process industry
- Suitable for ambient temperature up to 85°C

From page 15

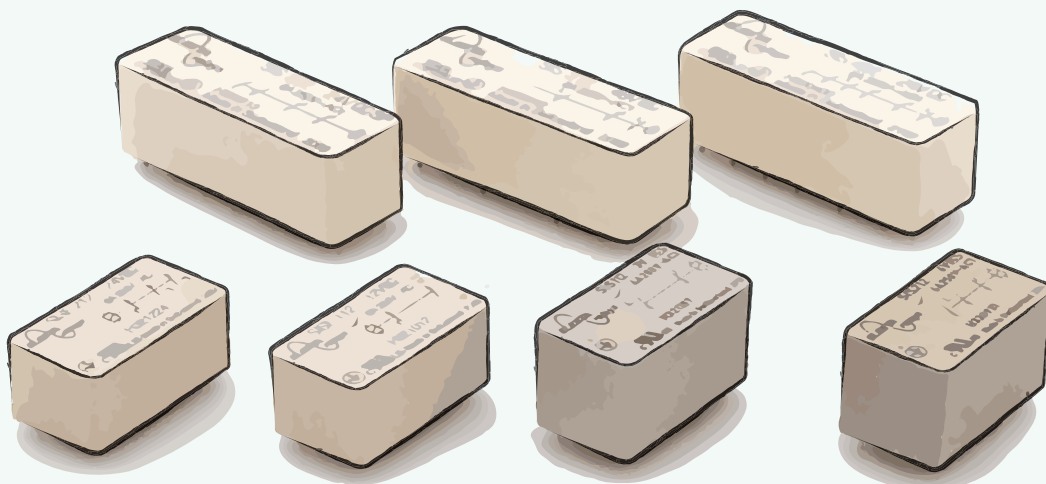
SISF2, SISF3

- Flat design:
maximum construction height 13 mm
- Notched crown contacts for very high contact reliability
- High shock and vibration resistance
- Switching current range: 3 mA, ..., 6 A
- Protection class: RT II

Areas of application:

- Transportation technology
- Medical technology
- Sensors
- Suitable for ambient temperature up to 85°C

From page 13



SIF3, SIF4, SIF6

- Super-flat design:
maximum overall height 10,9 mm
- Component placement under the relay possible
- Notched crown contacts for very high contact reliability
- Coils can be designed for railway application according to EN 50155
- Switching current range: 3 mA, ..., 10 A
- Protection class: RT II

Areas of application:

- Access controls
- Interfaces
- Robotics

From page 23

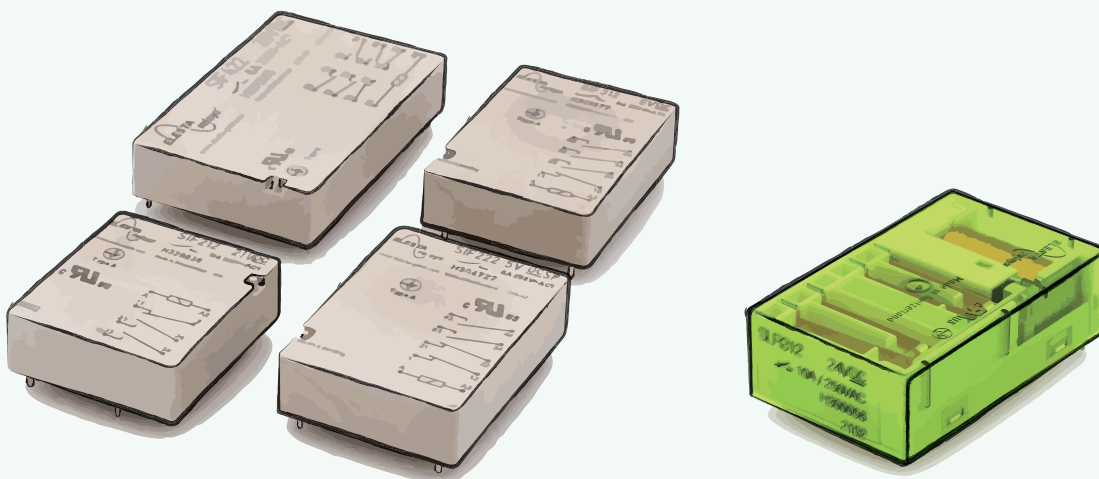
SLR4

- Flat design:
maximum overall height 16,5 mm
- High contact reliability
- Powerful
- Switching current range: 10 mA, ..., 10 A
- Protection class: RT II

Areas of application:

- Mechanical and plant engineering
- Railway technology
- Machine tools

Page 31



OUR MODEL SERIES

HIGHINSULATION

SGR282 ZK

- High test voltage resistance between coil and contacts up to 5000 V_{rms}
- Overmoulded coil design
- Application in ATEX area possible
- Notched crown contacts for very high contact reliability
- Contacts variable
- Switching current range: 4 mA, ..., 8 A
- Protection class: RT II

Areas of application:

- Transportation technology
- Process industry
- Mining

Page 27

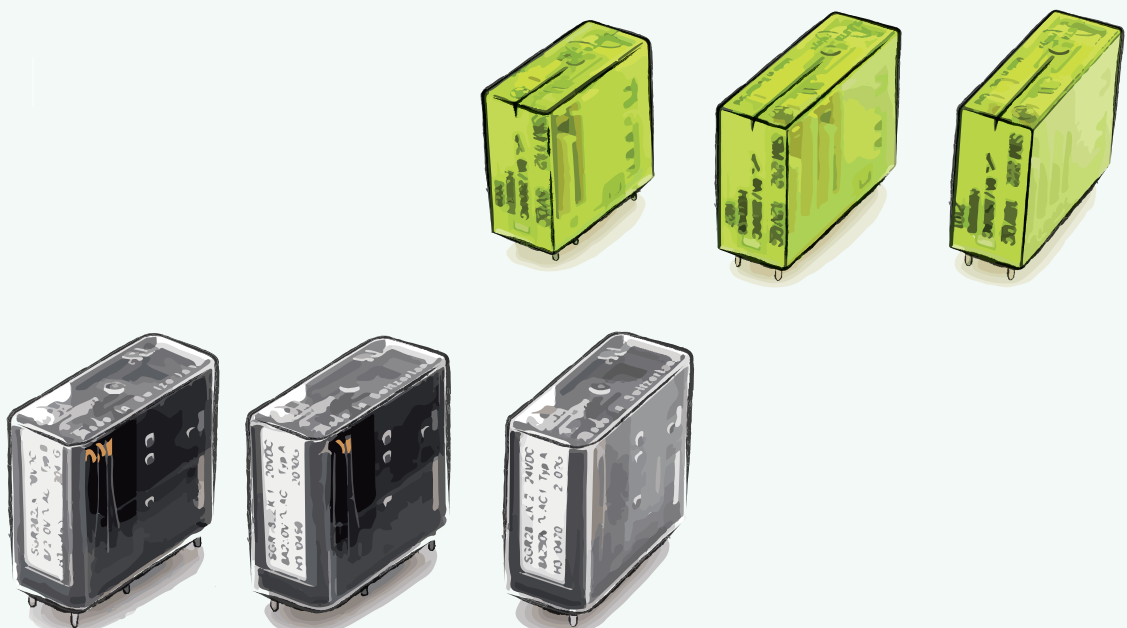
SIM2, SIM3, SIM4

- High test voltage resistance between coil and contacts up to 5000 V_{rms}
- Overmoulded coil design
- Application in ATEX area possible
- Extremely high clearance and creepage distances
- Switching current range: 10 mA, ..., 8 A
- Protection class: RT II

Areas of application:

- Process industry
- Lifting technology
- Interfaces
- Remote Control

From page 28



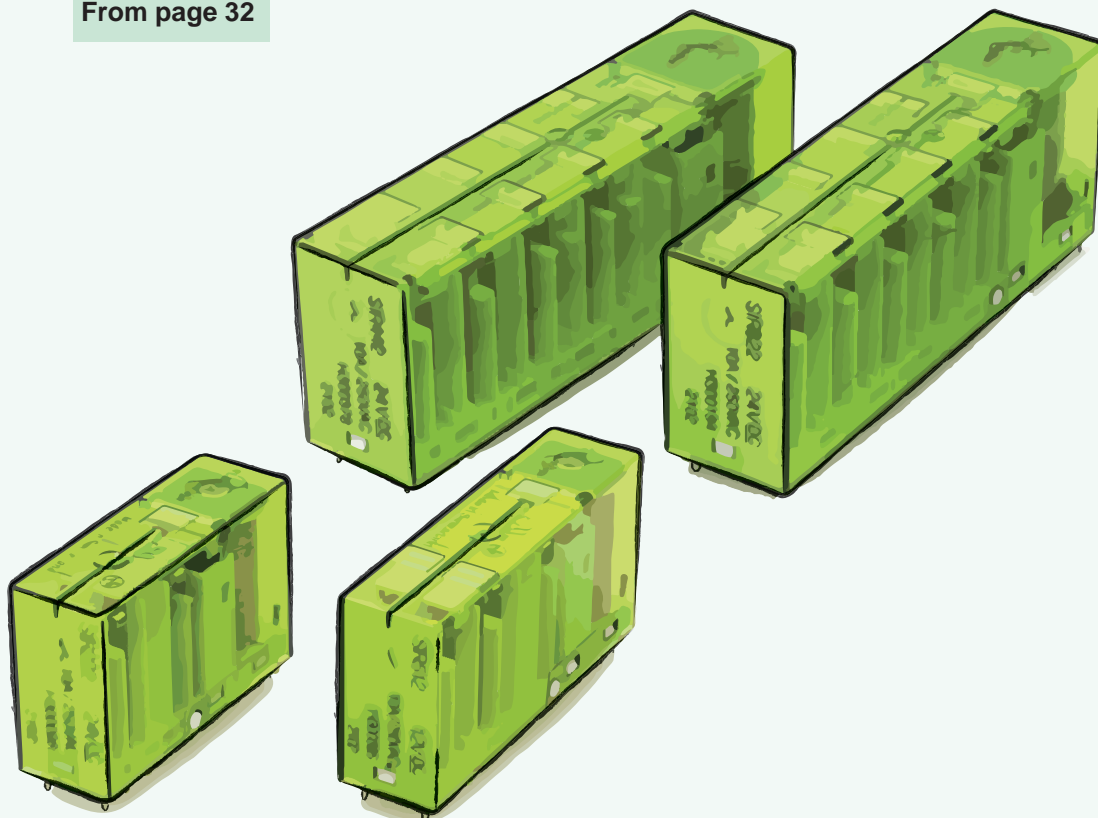
SIR4, SIR6, SIR8, SIR10

- Powerful
- High contact reliability
- Contact assignment freely configurable
- Low coil power loss
- Large coil working range with sensitive coil
- Coils can be designed for railway application according to EN 50155
- Switching current range: 10 mA, ..., 10 A
- Protection class: RT II

Areas of application:

- Lift technology
- Process industry
- Machine tools
- Vehicle construction

From page 32



VARIABLE & VERSATILE

OUR MODEL SERIES

TWO IN ONE

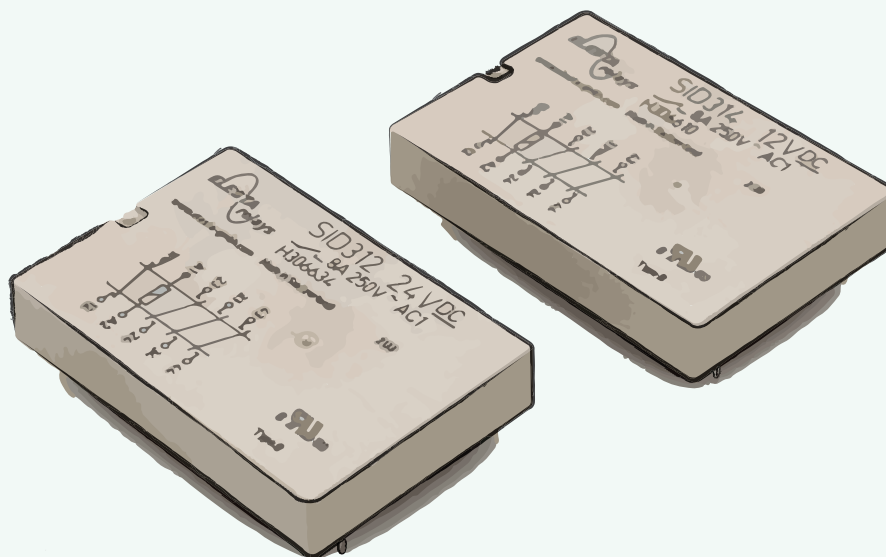
SID4

- Super-flat design:
maximum overall height 10,9 mm
- Double armature relay with 2 contacts
in series per path
- Dual-channel capability with only one
relay possible
- Component placement under the relay
possible
- Notched crown contacts for very high
contact reliability
- Switching current range: 3 mA, ..., 8 A
- Protection class: RT II

Areas of application:

- Access controls
- Interfaces
- Robotics
- Suitable for ambient temperature up
to 85°C

Page 26



SIR4P

- Extremely powerful
- High contact reliability
- For loads with high peak current
- Coils can be designed for railway application according to EN 50155
- Switching current range: 5 mA, ..., 12 A
- Protection class: RT II

Areas of application:

- Gate control
- Motion Control
- Transportation technology
- Agricultural machinery

Page 34

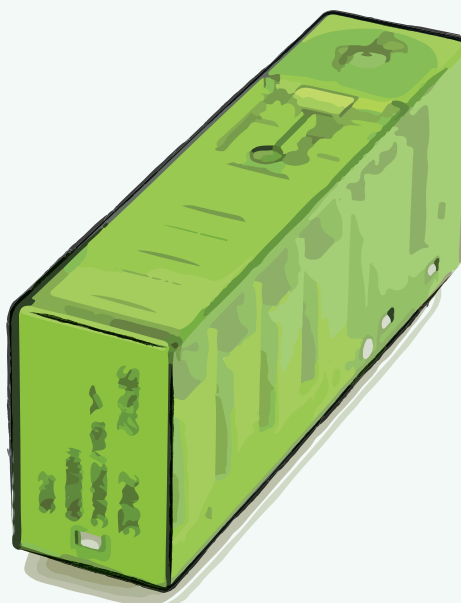
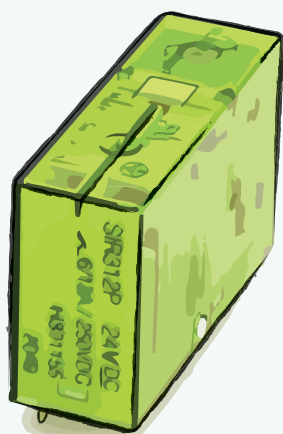
SIP6

- Extremely powerful
- Very high contact reliability
- For highest loads with 3-phase applications and DC loads
- Switching current range: 5 mA, ..., 16 A
- Protection class: RT II

Areas of application:

- Hydraulic controls
- Construction machinery
- Lifting technology
- Off-Shore
- Agricultural machinery

Page 39



POWERFUL

OUR MODEL SERIES

ROBUST

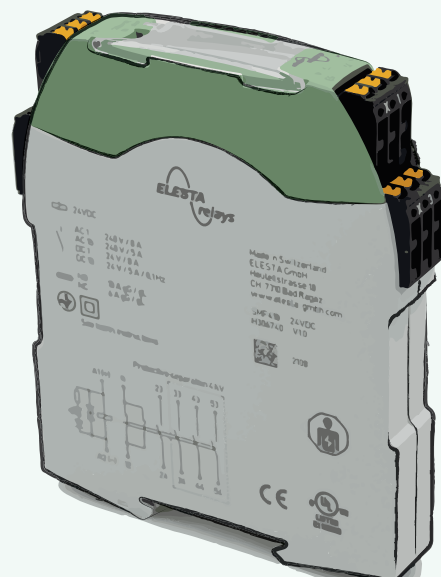
SMD4

- Notched crown contacts for very high contact reliability
- Integration in safety applications according to IEC/EN 62061, ISO/EN 13849 possible
- Two-channel capability possible
- Protective circuit for relay coil
- Robust housing for mounting on mounting rail
- Pluggable terminals with screw and push-in technology
- Switching current range: 3 mA, ..., 8 A
- Protection class: IP 20

Areas of application:

- Access controls
- Interfaces
- Lifts, escalators
- Railway application

Page 40



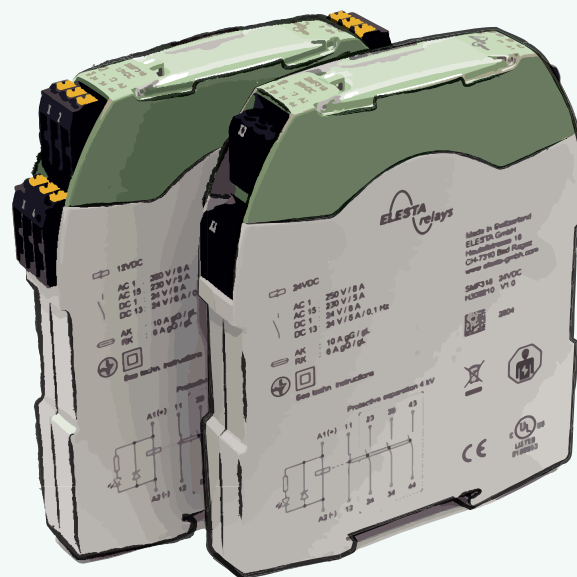
SMF3, SMF4, SMF5

- Notched crown contacts for very high contact reliability
- Integration in safety applications according to IEC/EN 62061, ISO/EN 13849 possible
- Protective circuit for relay coil
- Robust housing for mounting on mounting rail
- Pluggable terminals with screw and push-in technology
- Switching current range: 3 mA, ..., 10 A
- Protection class: IP 20

Areas of application:

- Access controls
- Interfaces
- Lifts, escalators
- Railway application

From page 41

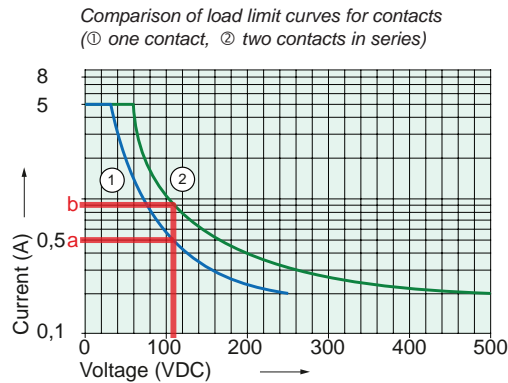
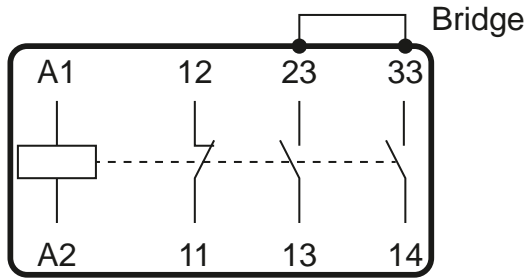


ROBUST

APPLICATION NOTES

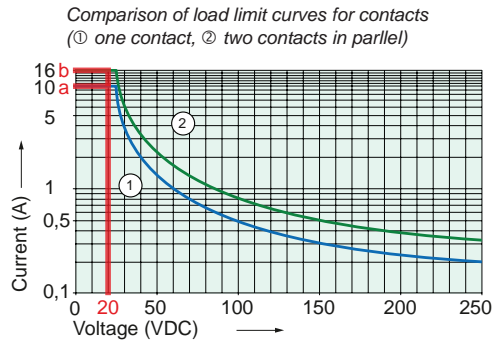
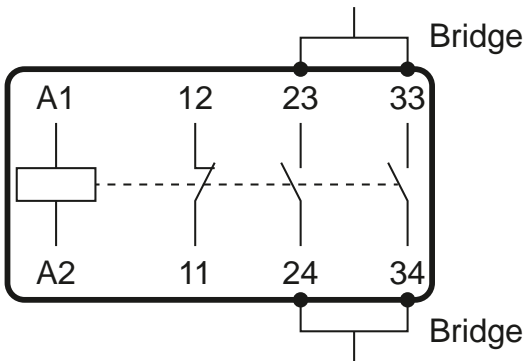
Series of contacts

By connecting two contacts in series, the contact life under aggressive switching loads with strong arcing can be increased by up to 50%. In addition, the air clearance is doubled for open contacts as opposed to a single contact. This significantly increases the possible maximum breaking capacity and is therefore particularly interesting for higher DC loads. For example, the maximum permissible current can be increased from 0.5 A (a) to 0.9 A (b) for a 110 VDC application.



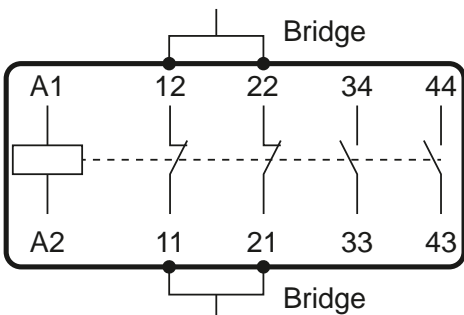
Parallel connection of 2 contacts for load sharing

Load current sharing is possible by connecting two contacts in parallel. However, the permissible current may only be increased by 60% of the permissible maximum current in order to avoid contact overload. This is caused by the asymmetrical distribution of the load on the contacts. This means that, for example, with a maximum permissible load current of 10 A at 20 VDC (a) on one contact, the possible total load can be increased to 16 A (b) by connecting 2 contacts in parallel.



Parallel connection of 2 contacts to increase the contact reliability

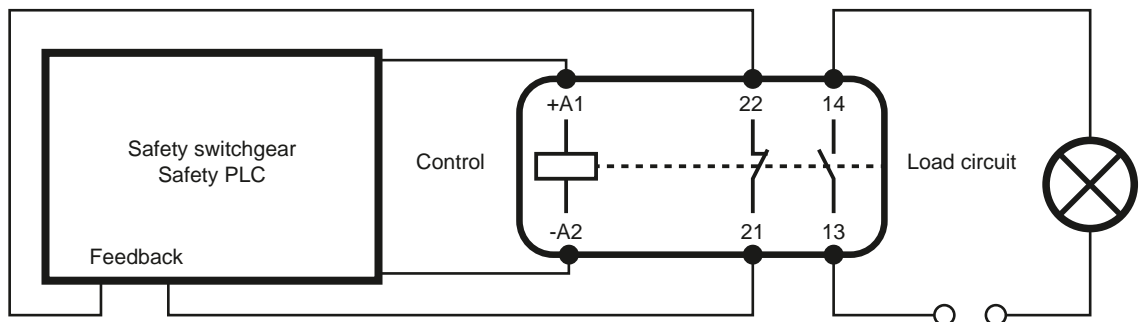
By connecting two relay contacts in parallel, the contact reliability can be increased at very low switching loads or low switching cycles (low demand). Combined with the notched crown contacts, which in themselves achieve an extremely high contact availability, this can be increased even further. Especially for feedback contacts, e.g. NC, this is a proven method.



Notched crown contact

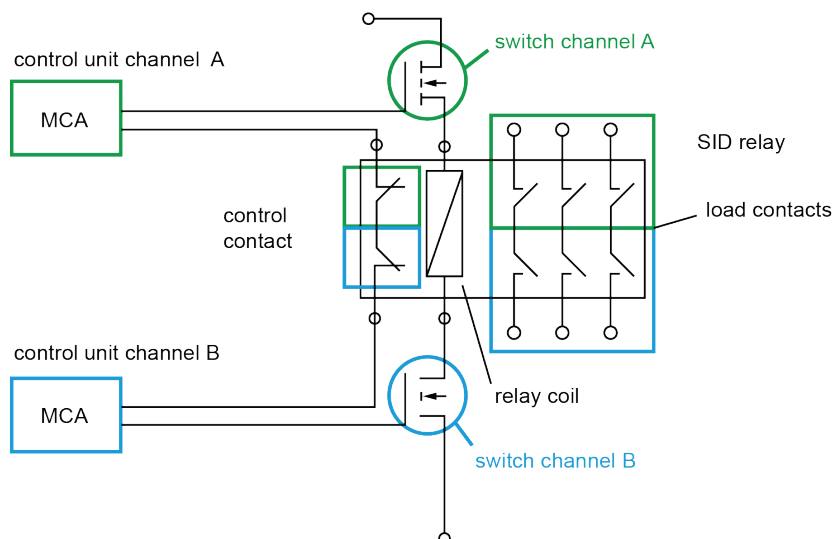
Contact extension with connection to safety PLC or safety switching device

By integrating the feedback contacts of the forcibly guided relay into the enable path of a PLC or a safety switching device, a process can be prevented from being restarted after an incorrect switch-off. By connecting the contacts of two relays in series, a safe switch-off can be guaranteed even if one relay welds. The integration of the feedback contacts, which are also connected in series, reliably prevents a new process start or a restart of a plant.



Two-channel control of double armature relays

For the realisation of applications in the range of SIL3 (IEC 61061) or PL "e" (ISO 13849), the relay coil must be controlled in two channels. By controlling the coil, as in the example diagram, the two channels (here called MCA and MCB) are individually able to interrupt the coil current. The two NC contacts connected in series internally, which form the feedback circuit of the relay, must also be monitored by both channels to prevent them from switching on again in the event of a fault. Additional testing of the switch-off capability of the individual channels as well as, if desired, a power reduction by PWM can be integrated into the channels.



Manipulation security through lacquer and wiring

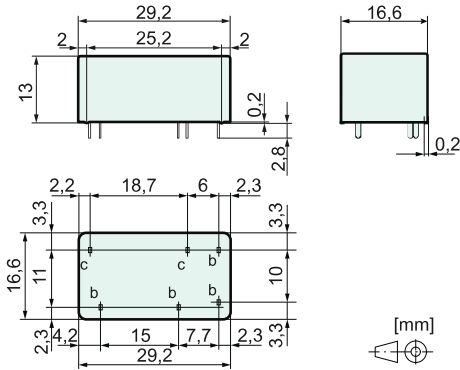
Screw and plug-in points can be fixed with screw locking lacquer which is applied after assembly. Any subsequent unauthorized opening of the screwed or plugged connections can thus be traced. When wiring, make sure that the cables are routed correctly. In conjunction with a clear assignment of the relay contacts and their connection points, a mix-up of the connection cables can be prevented.



Features

- Relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Suitable for print mounting
- Height only 13 mm
- Contact assembly
SISF112: 1 NO + 1 NC

Dimensions



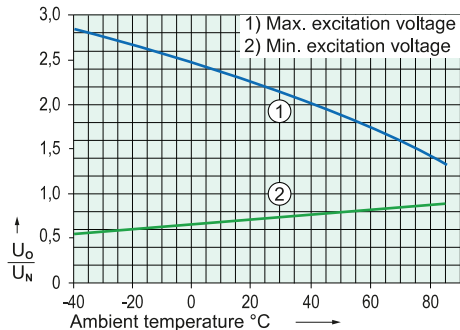
Pin dimension b	1,0 x 0,3 mm
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

Coil data at 20 °C

Nominal power (typ.)	0,45 W
Holding power (typ.)	0,18 W
Coil limit temperature	120 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)	Resistance (Ohm)
5,0	3,5	0,5	90	56 (1 ± 10 %)
12,0	8,4	1,2	38	320 (1 ± 10 %)
18,0	12,6	1,8	25	720 (1 ± 10 %)
24,0	16,8	2,4	19	1280 (1 ± 10 %)
48,0	33,6	4,8	9	5160 (1 ± 13 %)
60,0	42,0	6,0	8	8000 (1 ± 15 %)

Excitation voltage range



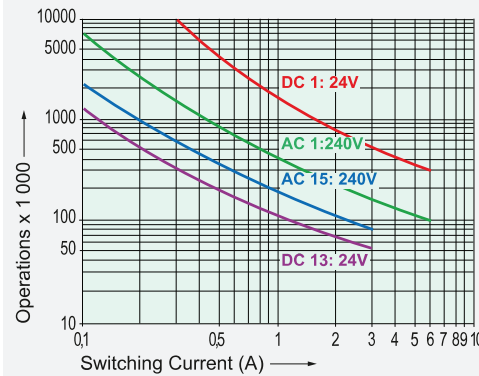
- Test conditions:
- Graph 1: Contact current 4 A MAX
 - Graph 2: without previous operation
 - Free-standing relay on PCB
 - Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power	1500 VA
250 V / 6 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	90000
Inrush current	30 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	3 mA, ..., 6 A
Switching power range*	40 mW, ..., 1500 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of contacts**	1000 A
with pre-fuse	SCPD 6 A gG / gL (fuse)

* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

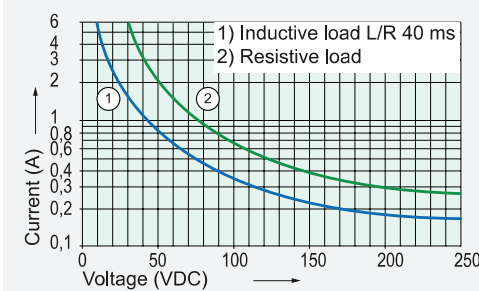


Switching capacity (IEC 61810-1)

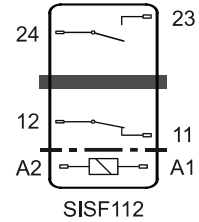
AC-1:	240 V / 6 A MAX
AC-15:	240 V / 3 A MAX
DC-1:	24 V / 6 A MAX
DC-13:	24 V / 3 A / 0,1 Hz MAX
	L/R = 40 ms

Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of:	
1 contact	6 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Double or reinforced insulation	-----
- Air and creepage distance (min.)	5,5 mm
- Test voltage	4000 V _{rms} / 1 min
Double or reinforced insulation	-----
- Air and creepage distance (min.)	8 mm
- Test voltage	4000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Contact opening: open contact	micro-disconnection
Creepage resistance	CTI 175
Pollution degree	2
Overvoltage category	III
Insulation resistance (min.)	100 MΩ
- Test voltage	500 VDC

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	10 ms
Drop-out time (NC closed) (typ.)*	3 ms
Bounce time (typ.)	NO: 2 ms / NC: 15 ms
Shock resistance (16 ms) (min.)	NO: 17g / NC: 10g
Vibration resistance (10-200 Hz) (min.)	NO: 7g / NC: 3g
Weight	approx. 16 g
Mounting position	any
Mounting distance (min.)	5 mm

* without coil wiring

Other data

Ambient temperature	-40 °C, ..., +85 °C
Thermal resistance	45 K / W
Protection class	RT II
Solder bath temperature	270 °C / 5 s
Test method (heating)	A (group assembly)
Approvals	cULus, TÜV
Flammability class	UL 94 V-0
UL File	E503456 Sec.1

Options, Accessories

Other pin lengths	possible
Other coil designs	possible

Product key

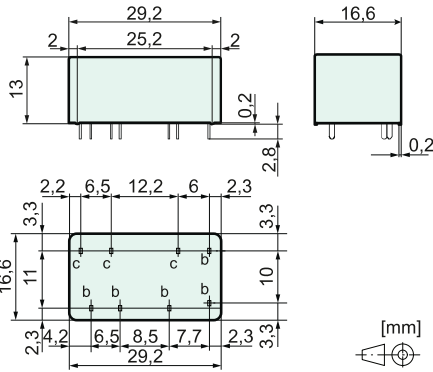
SISF	1	1	2	24VDC	XX
SISF	Type designation				
1	Number of contacts NO				
1	Number of contacts NC				
2	Connection technology		2 = Solder terminals		
24VDC	Nominal coil voltage				
XX	Options				



Features

- Relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Suitable for print mounting
- Height only 13 mm
- Contact assembly
SISF212: 2 NO + 1 NC

Dimensions



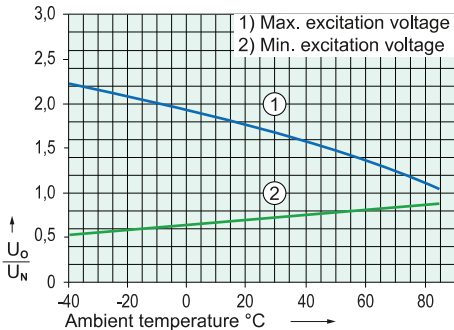
Pin dimension b	1,0 x 0,3 mm
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

Coil data at 20 °C

Nominal power (typ.)	0,8 W
Holding power (typ.)	0,25 W
Coil limit temperature	120 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)	Resistance (Ohm)
5,0	3,5	0,5	160	31 (1 ± 10 %)
12,0	8,4	1,2	67	180 (1 ± 10 %)
18,0	12,6	1,8	44	405 (1 ± 10 %)
24,0	16,8	2,4	33	720 (1 ± 10 %)
48,0	33,6	4,8	17	2880 (1 ± 10 %)
60,0	42,0	6,0	13	4500 (1 ± 13 %)

Excitation voltage range



Test conditions:

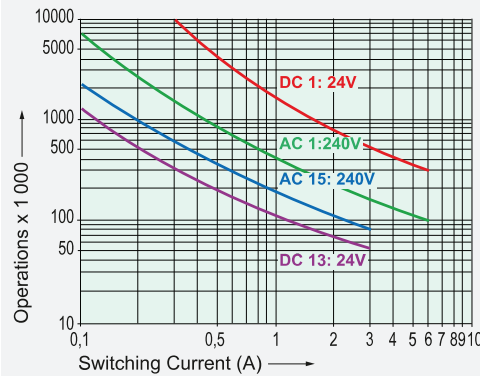
- Graph 1: Contact current 4 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power	1500 VA
250 V / 6 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	90000
Inrush current	30 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	3 mA, ..., 6 A
Switching power range*	40 mW, ..., 1500 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of contacts**	1000 A
with pre-fuse	SCPD 6 A gG / gL (fuse)

* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

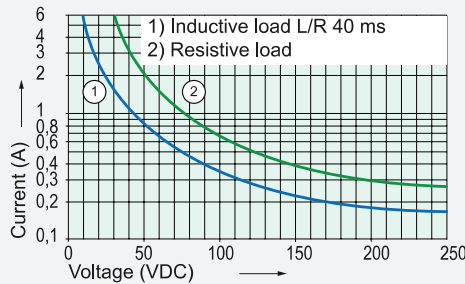


Switching capacity (IEC 61810-1)

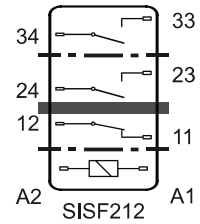
AC-1:	240 V / 6 A MAX
AC-15:	240 V / 3 A MAX
DC-1:	24 V / 6 A MAX
DC-13:	24 V / 3 A / 0,1 Hz MAX
	L/R = 40 ms

Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of:	6 A MAX
1 or 2 contacts	

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Double or reinforced insulation	
- Air and creepage distance (min.)	5,5 mm
- Test voltage	4000 V _{rms} / 1 min
Double or reinforced insulation	
- Air and creepage distance (min.)	8 mm
- Test voltage	4000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Contact opening: open contact	micro-disconnection
Creepage resistance	CTI 175
Pollution degree	2
Overvoltage category	III
Insulation resistance (min.)	100 MΩ
- Test voltage	500 VDC

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	10 ms
Drop-out time (NC closed) (typ.)*	3 ms
Bounce time (typ.)	NO: 3 ms / NC: 15 ms
Shock resistance (16 ms) (min.)	NO: 17g / NC: 10g
Vibration resistance (10-200 Hz) (min.)	NO: 7g / NC: 3g
Weight	approx. 16 g
Mounting position	any
Mounting distance (min.)	5 mm

* without coil wiring

Other data

Ambient temperature	-40 °C, ..., +85 °C
Thermal resistance	45 K / W
Protection class	RT II
Solder bath temperature	270 °C / 5 s
Test method (heating)	A (group assembly)
Approvals	cULus, TÜV
Flammability class	UL 94 V-0
UL File	E503456 Sec.1

Options, Accessories

Other pin lengths	possible
Other coil designs	possible

Product key

SISF 2 1 2 24VDC XX

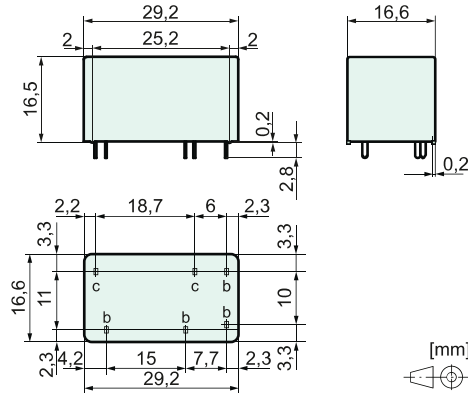
SISF	Type designation	
2	Number of contacts NO	
1	Number of contacts NC	
2	Connection technology	2 = Solder terminals
24VDC	Nominal coil voltage	
XX	Options	



Features

- Relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Suitable for print mounting
- Small design
- Contact assembly
SIS112: 1 NO + 1 NC

Dimensions



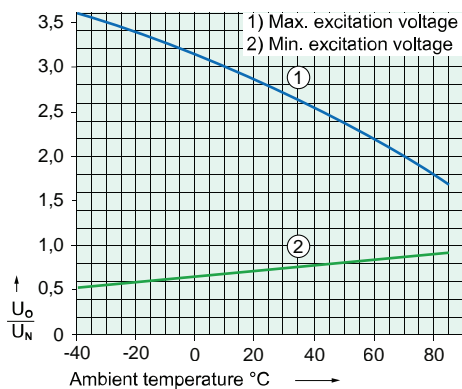
Pin dimension b	1,0 x 0,3 mm
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

Coil data at 20 °C

Nominal power (typ.)	0,27 W
Holding power (typ.)	0,08 W
Coil limit temperature	120 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)	Resistance (Ohm)
5,0	3,5	0,5	55	91 (1 ± 10 %)
12,0	8,4	1,2	23	520 (1 ± 10 %)
18,0	12,6	1,8	15	1180 (1 ± 10 %)
24,0	16,8	2,4	11	2100 (1 ± 10 %)
48,0	33,6	4,8	6	8350 (1 ± 13 %)
60,0	42,0	6,0	5	13100 (1 ± 15 %)

Excitation voltage range



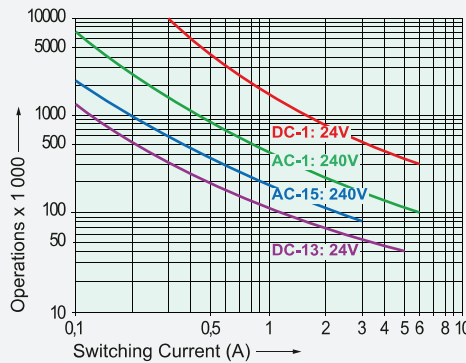
- Test conditions:
- Graph 1: Contact current 4 A MAX
 - Graph 2: without previous operation
 - Free-standing relay on PCB
 - Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power	1500 VA
250 V / 6 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	90000
Inrush current	30 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	3 mA, ..., 6 A
Switching power range*	40 mW, ..., 1500 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of contacts**	1000 A
with pre-fuse	SCPD 6 A gG / gL (fuse)

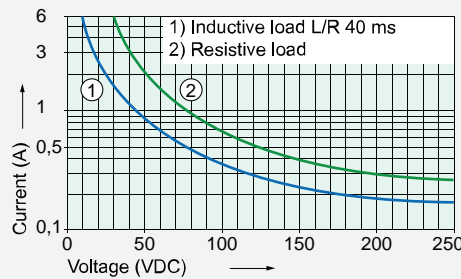
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

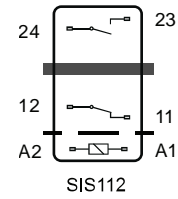


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 6 A MAX
AC-15:	240 V / 3 A MAX
DC-1:	24 V / 6 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX
Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of:	
1 contact	6 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	
- Air and creepage distance (min.)	4 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	
- Air and creepage distance (min.)	10 mm
- Test voltage	5000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Creepage resistance	CTI 175
Pollution degree	2
Overvoltage category	III
Insulation resistance (min.)	100 MΩ
- Test voltage	500 VDC

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	10 ms
Drop-out time (NC closed) (typ.)*	3 ms
Bounce time (typ.)	NO: 2 ms / NC: 15 ms
Shock resistance (16 ms) (min.)	NO: 17g / NC: 7g
Vibration resistance (10-200 Hz) (min.)	NO: 7g / NC: 2g
Weight	approx. 18 g
Mounting position	any
Mounting distance (min.)	1 mm

* without coil wiring

Other data

Ambient temperature	-40 °C, ..., +85 °C
Thermal resistance	55 K / W
Protection class	RT III
Solder bath temperature	270 °C / 5 s
Test method (heating)	A (group assembly)
Approvals	cULus, TÜV
Flammability class	UL 94 V-0
UL File	E188953 Sec. 5

Options, Accessories

Mounting rail socket	SRD SIS3
Pin lengths for mounting rail socket	3,8 mm
Other pin lengths	possible
Other coil designs	possible
Coils accord. to EN 50155 (railway applications)	possible

Product key

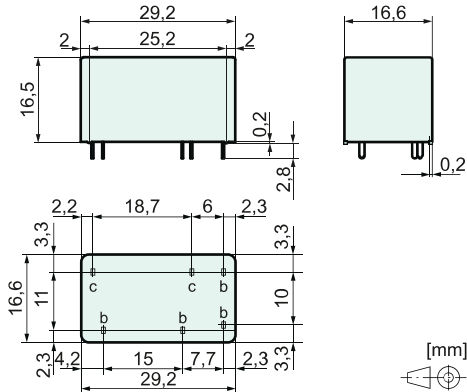
SIS	1	1	2	24VDC	XX
SIS	Type designation				
1	Number of contacts NO				
1	Number of contacts NC				
2	Connection technology				
24VDC	Nominal coil voltage				
XX	Options				



Features

- Relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Suitable for print mounting
- Small design
- Low nominal and holding power
- Contact assembly
SIS112 SEN: 1 NO + 1 NC

Dimensions



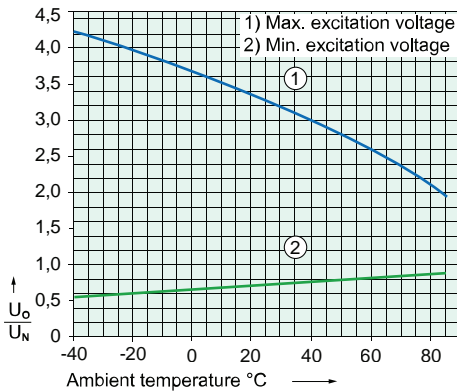
Pin dimension b	1,0 x 0,3 mm
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	∅ 1,3 mm

Coil data at 20 °C

Nominal power	0,2 W
Holding power	0,04 W
Coil limit temperature	120 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)	Resistance (Ohm)
3,0	2,3	0,3	67	45 (1 ± 10 %)
5,0	3,8	0,5	40	125 (1 ± 10 %)
12,0	9,0	1,2	17	720 (1 ± 10 %)
18,0	13,5	1,8	11	1620 (1 ± 10 %)
24,0	18,0	2,4	8	2880 (1 ± 10 %)
48,0	36,0	4,8	4	11520 (1 ± 13 %)
60,0	45,0	6,0	3	18000 (1 ± 15 %)

Excitation voltage range



Test conditions:

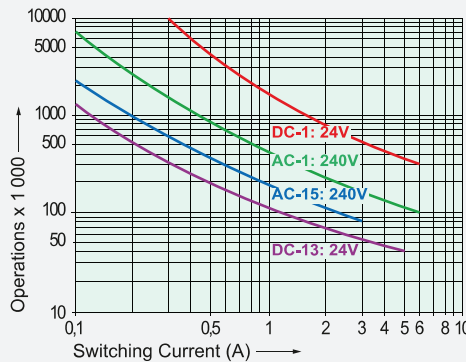
- Graph 1: Contact current 4 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power	1500 VA
250 V / 6 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	90000
Inrush current	30 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	3 mA, ..., 6 A
Switching power range*	40 mW, ..., 1500 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of contacts**	1000 A
with pre-fuse	SCPD 6 A gG / gL (fuse)

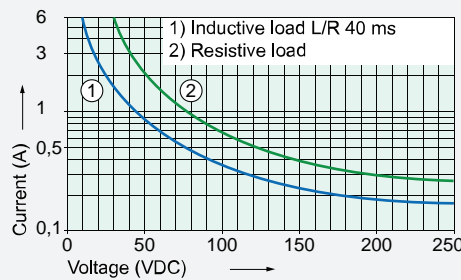
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

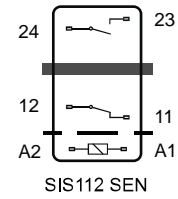


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 6 A MAX
AC-15:	240 V / 3 A MAX
DC-1:	24 V / 6 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX
Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of:	
1 contact	6 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	4 mm
- Air and creepage distance (min.)	4 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	10 mm
- Air and creepage distance (min.)	10 mm
- Test voltage	5000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Creepage resistance	CTI 175
Pollution degree	2
Overvoltage category	III
Insulation resistance (min.)	100 MΩ
- Test voltage	500 VDC

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	12 Hz
Response time (NO closed) (typ.)	15 ms
Drop-out time (NC closed) (typ.)*	5 ms
Bounce time (typ.)	NO: 2 ms / NC: 15 ms
Shock resistance (16 ms) (min.)	NO: 17g / NC: 7g
Vibration resistance (10-200 Hz) (min.)	NO: 7g / NC: 2g
Weight	approx. 18 g
Mounting position	any
Mounting distance (min.)	1 mm

* without coil wiring

Other data

Ambient temperature	-40 °C, ..., +85 °C
Thermal resistance	55 K / W
Protection class	RT III
Solder bath temperature	270 °C / 5 s
Test method (heating)	A (group assembly)
Approvals	cULus, TÜV
Flammability class	UL 94 V-0
UL File	E188953 Sec. 5

Options, Accessories

Mounting rail socket	SRD SIS3
Pin lengths for mounting rail socket	3,8 mm
Other pin lengths	possible
Other coil designs	possible
Coils accord. to EN 50155 (railway applications)	possible

Product key

SIS 1 1 2 24VDC SEN XX

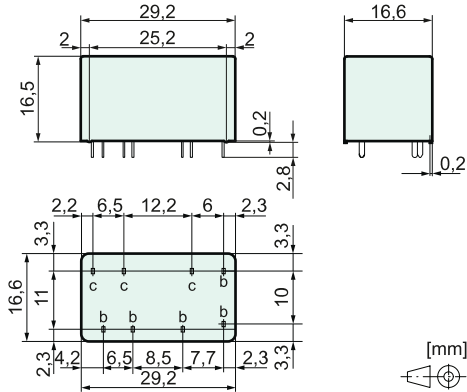
SIS	Type designation	
1	Number of contacts NO	
1	Number of contacts NC	
2	Connection technology	2 = Solder terminals
24VDC	Nominal coil voltage	
SEN	sensitive coil	
XX	Options	



Features

- Relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Suitable for print mounting
- Compact design
- Contact assembly
SIS212: 2 NO + 1 NC

Dimensions



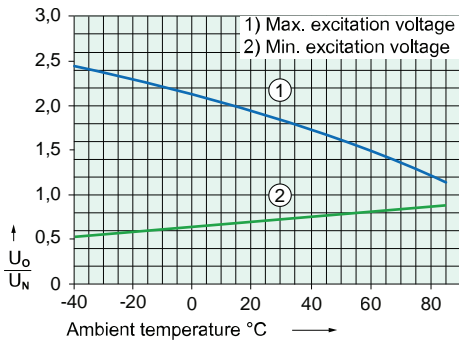
Pin dimension b	1,0 x 0,3 mm
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

Coil data at 20 °C

Nominal power (typ.)	0,6 W
Holding power (typ.)	0,18 W
Coil limit temperature	120 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)	Resistance (Ohm)
5,0	3,5	0,5	120	42 (1 ± 10 %)
12,0	8,4	1,2	50	240 (1 ± 10 %)
18,0	12,6	1,8	33	540 (1 ± 10 %)
24,0	16,8	2,4	25	960 (1 ± 10 %)
48,0	33,6	4,8	13	3840 (1 ± 10 %)
60,0	42,0	6,0	10	6000,0 (1 ± 13 %)
110,0	77,0	11,0	5	20150,0 (1 ± 15 %)

Excitation voltage range



Test conditions:

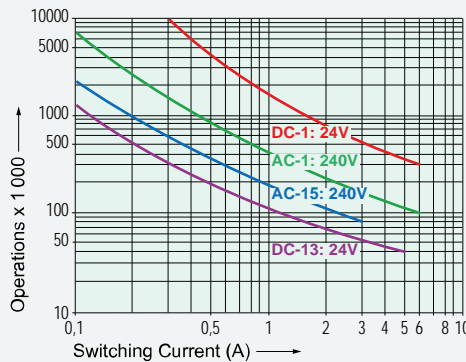
- Graph 1: Contact current 4 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power	1500 VA
250 V / 6 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	90000
Inrush current	30 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	3 mA, ..., 6 A
Switching power range*	40 mW, ..., 1500 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of contacts**	1000 A
with pre-fuse	SCPD 6 A gG / gL (fuse)

* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)



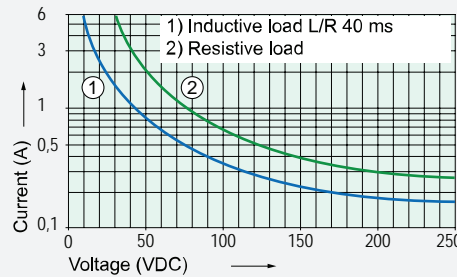
Switching capacity (IEC 61810-1)

AC-1:	240 V / 6 A MAX
AC-15:	240 V / 3 A MAX
DC-1:	24 V / 6 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX

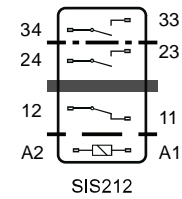
Switching capacity (UL 508)

B300, R300	
Continuous current per contact at load of: 1 or 2 contacts	6 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	4 mm
- Air and creepage distance (min.)	4 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	5,5 mm
- Air and creepage distance (min.)	5,5 mm
- Test voltage	4000 V _{rms} / 1 min
Double or reinforced insulation	8 mm
- Air and creepage distance (min.)	8 mm
- Test voltage	4000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Creepage resistance	CTI 175
Pollution degree	2
Overvoltage category	III
Insulation resistance (min.)	100 MΩ
- Test voltage	500 VDC

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	10 ms
Drop-out time (NC closed) (typ.)*	3 ms
Bounce time (typ.)	NO: 2 ms / NC: 15 ms
Shock resistance (16 ms) (min.)	NO: 17g / NC: 10g
Vibration resistance (10-200 Hz) (min.)	NO: 7g / NC: 3g
Weight	approx. 20 g
Mounting position	any
Mounting distance (min.)	1 mm

* without coil wiring

Other data

Ambient temperature	-40 °C, ..., +85 °C
Thermal resistance	55 K / W
Protection class	RT III
Solder bath temperature	270 °C / 5 s
Test method (heating)	A (group assembly)
Approvals	cULus, TÜV
Flammability class	UL 94 V-0
UL File	E188953 Sec. 5

Options, Accessories

Mounting rail socket	SRD SIS3
Pin lengths for mounting rail socket	3,8 mm
Other pin lengths	possible
Other coil designs	possible
Coils accord. to EN 50155 (railway applications)	possible

Product key

SIS 2 1 2 24VDC XX

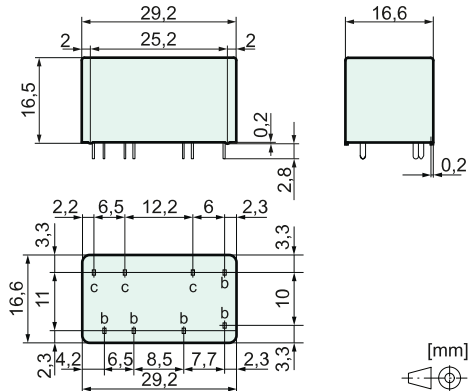
SIS	Type designation	
2	Number of contacts NO	
1	Number of contacts NC	
2	Connection technology	2 = Solder terminals
24VDC	Nominal coil voltage	
XX	Options	



Features

- Relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Suitable for print mounting
- Compact design
- Low nominal and holding power
- Contact assembly
SIS212: 2 NO + 1 NC

Dimensions



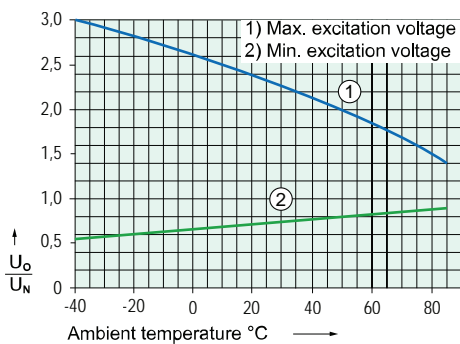
Pin dimension b	1,0 x 0,3 mm
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

Coil data at 20 °C

Nominal power (typ.)	0,4 W
Holding power (typ.)	0,14 W
Coil limit temperature	120 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)	Resistance (Ohm)
3,0	2,3	0,3	133	23 (1 ± 10 %)
5,0	3,8	0,5	80	63 (1 ± 10 %)
12,0	9,0	1,2	33	360 (1 ± 10 %)
18,0	13,5	1,8	22	810 (1 ± 10 %)
24,0	18,0	2,4	17	1440 (1 ± 10 %)
48,0	36,0	4,8	8	5750 (1 ± 10 %)
60,0	45,0	6,0	7	9000 (1 ± 13 %)

Excitation voltage range



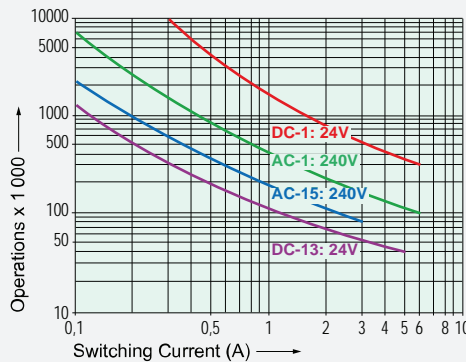
- Test conditions:
- Graph 1: Contact current 4 A MAX
 - Graph 2: without previous operation
 - Free-standing relay on PCB
 - Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power	1500 VA
250 V / 6 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	90000
Inrush current	30 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	3 mA, ..., 6 A
Switching power range*	40 mW, ..., 1500 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of contacts**	1000 A
with pre-fuse	SCPD 6 A gG / gL (fuse)

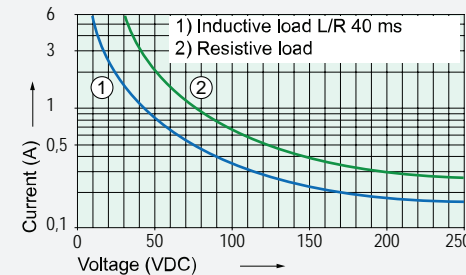
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

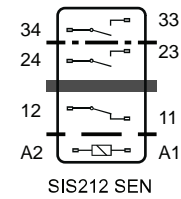


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 6 A MAX
AC-15:	240 V / 3 A MAX
DC-1:	24 V / 6 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX
Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of:	
1 or 2 contacts	6 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	4 mm
- Air and creepage distance (min.)	4 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	5,5 mm
- Air and creepage distance (min.)	5,5 mm
- Test voltage	4000 V _{rms} / 1 min
Double or reinforced insulation	8 mm
- Air and creepage distance (min.)	8 mm
- Test voltage	4000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Creepage resistance	CTI 175
Pollution degree	2
Overvoltage category	III
Insulation resistance (min.)	100 MΩ
- Test voltage	500 VDC

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	10 ms
Drop-out time (NC closed) (typ.)*	3 ms
Bounce time (typ.)	NO: 2 ms / NC: 15 ms
Shock resistance (16 ms) (min.)	NO: 17g / NC: 10g
Vibration resistance (10-200 Hz) (min.)	NO: 7g / NC: 3g
Weight	approx. 20 g
Mounting position	any
Mounting distance (min.)	1 mm

* without coil wiring

Other data

Ambient temperature	-40 °C, ..., +85 °C
Thermal resistance	55 K / W
Protection class	RT III
Solder bath temperature	270 °C / 5 s
Test method (heating)	A (group assembly)
Approvals	cULus, TÜV
Flammability class	UL 94 V-0
UL File	E188953 Sec. 5

Options, Accessories

Mounting rail socket	SRD SIS3
Pin lengths for mounting rail socket	3,8 mm
Other pin lengths	possible
Other coil designs	possible
Coils accord. to EN 50155 (railway applications)	possible

Product key

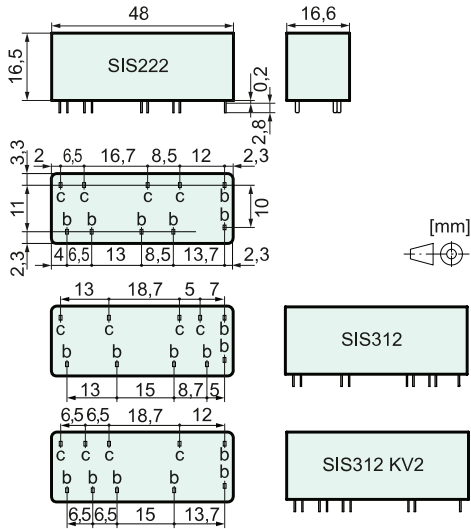
SIS	Type designation	
2	Number of contacts NO	
1	Number of contacts NC	
2	Connection technology	2 = Solder terminals
24VDC	Nominal coil voltage	
SEN	sensitive coil	
XX	Options	



Features

- Relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Suitable for print mounting
- Contact assembly
SIS222: 2 NO + 2 NC, SIS312: 3 NO + 1 NC, SIS312 KV2: 3 NO + 1 NC

Dimensions



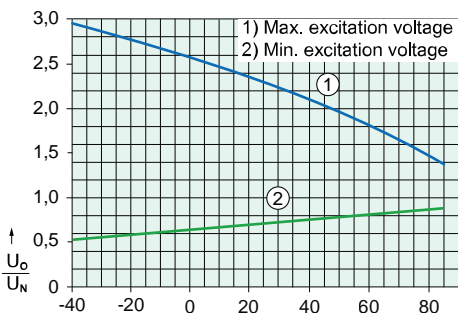
Pin dimension b	1,0 x 0,3 mm
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

Coil data at 20 °C

Nominal power	0,5 W
Holding power	0,15 W
Coil limit temperature	120 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)	Resistance (Ohm)
5,0	3,5	0,5	100	50 (1 ± 10 %)
12,0	8,4	1,2	42	285 (1 ± 10 %)
18,0	12,6	1,8	28	640 (1 ± 10 %)
24,0	16,8	2,4	21	1150 (1 ± 10 %)
48,0	33,6	4,8	10	4600 (1 ± 10 %)
60,0	42,0	6,0	8	7200 (1 ± 13 %)
110,0	77,0	11,0	5	24200 (1 ± 15 %)

Excitation voltage range



Test conditions:

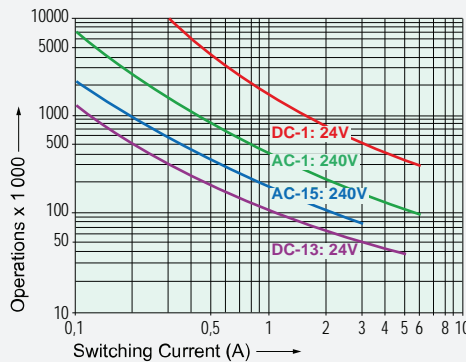
- Graph 1: Contact current 4 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power	1500 VA
250 V / 6 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	90000
Inrush current	30 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	3 mA, ..., 6 A
Switching power range*	40 mW, ..., 1500 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of contacts**	1000 A
with pre-fuse	SCPD 6 A gG / gL (fuse)

* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)



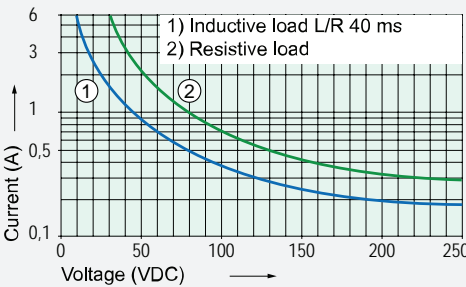
Switching capacity (IEC 61810-1)

AC-1:	240 V / 6 A MAX
AC-15:	240 V / 3 A MAX
DC-1:	24 V / 6 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX

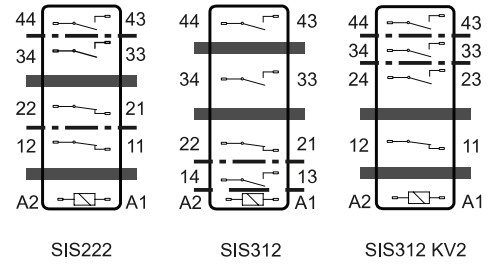
Switching capacity (UL 508)

Continuous current per contact at load of:	B300, R300
1 or 2 contacts	6 A MAX
3 contacts	4 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	4 mm
- Air and creepage distance (min.)	4 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	5,5 mm
- Air and creepage distance (min.)	5,5 mm
- Test voltage	4000 V _{rms} / 1 min
Double or reinforced insulation	8 mm
- Air and creepage distance (min.)	8 mm
- Test voltage	4000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Creepage resistance	CTI 175
Pollution degree	2
Overvoltage category	III
Insulation resistance (min.)	100 MΩ
- Test voltage	500 VDC

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	15 ms
Drop-out time (NC closed) (typ.)*	5 ms
Bounce time (typ.)	NO: 2 ms / NC: 15 ms
Shock resistance (16 ms) (min.)	NO: 10g / NC: 10g
Vibration resistance (10-200 Hz) (min.)	NO: 10g / NC: 4g
Weight	approx. 30 g
Mounting position	any
Mounting distance (min.)	1 mm

* without coil wiring

Other Data

Ambient temperature	-40 °C, ..., +85 °C
Thermal resistance	45 K / W
Protection class	RT III
Solder bath temperature	270 °C / 5 s
Test method (heating)	A (group assembly)
Approvals	cULus, TÜV
Flammability class	UL 94 V-0
UL File	E188953 Sec. 5

Options, Accessories

Other pin lengths	possible
Other coil designs	possible
Coils accord. to EN 50155 (railway applications)	possible

Product key

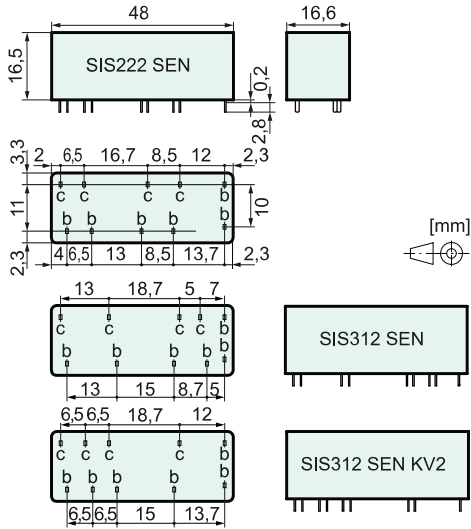
SIS	3	1	2	24VDC	XX
SIS	Type designation				
3	Number of contacts NO				
1	Number of contacts NC				
2	Connection technology		2 = Solder terminals		
24VDC	Nominal coil voltage				
XX	Options				



Features

- Relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Suitable for print mounting
- Low nominal and holding power
- Contact assembly
- SIS222 SEN: 2 NO + 2 NC, SIS312 SEN: 3 NO + 1 NC, SIS312 SEN KV2: 3 NO + 1 NC

Dimensions



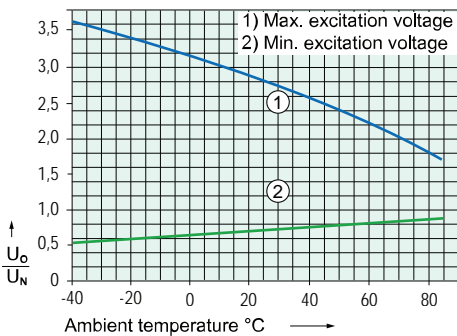
Pin dimension b	1,0 x 0,3 mm
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

Coil data at 20 °C

Nominal power (typ.)	0,33 W
Holding power (typ.)	0,08 W
Coil limit temperature	120 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)	Resistance (Ohm)
3,0	2,3	0,3	111	27 (1 ± 10 %)
5,0	3,8	0,5	67	75 (1 ± 10 %)
12,0	9,0	1,2	28	430 (1 ± 10 %)
18,0	13,3	1,8	19	970 (1 ± 10 %)
24,0	18,0	2,4	14	1730 (1 ± 10 %)
48,0	35,5	4,8	7	6980 (1 ± 10 %)
60,0	45,0	6,0	6	10800 (1 ± 10 %)

Excitation voltage range



Test conditions:

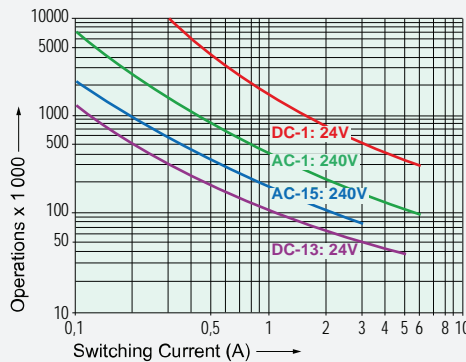
- Graph 1: Contact current 4 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power	1500 VA
250 V / 6 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	90000
Inrush current	30 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	3 mA, ..., 6 A
Switching power range*	40 mW, ..., 1500 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of contacts**	1000 A
with pre-fuse	SCPD 6 A gG / gL (fuse)

* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)



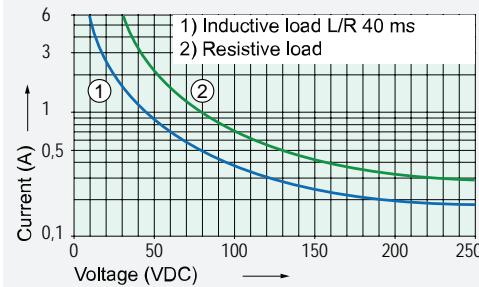
Switching capacity (IEC 61810-1)

AC-1:	240 V / 6 A MAX
AC-15:	240 V / 3 A MAX
DC-1:	24 V / 6 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX

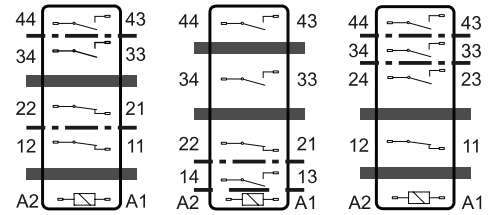
Switching capacity (UL 508)

B300, R300	
Continuous current per contact at load of:	
1 or 2 contacts	6 A MAX
3 contacts	4 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



SIS222 SEN SIS312 SEN SIS312 SEN KV2

Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	4 mm
- Air and creepage distance (min.)	4 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	5,5 mm
- Air and creepage distance (min.)	5,5 mm
- Test voltage	4000 V _{rms} / 1 min
Double or reinforced insulation	8 mm
- Air and creepage distance (min.)	8 mm
- Test voltage	4000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Creepage resistance	CTI 175
Pollution degree	2
Overvoltage category	III
Insulation resistance (min.)	100 MΩ
- Test voltage	500 VDC

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	20 ms
Drop-out time (NC closed) (typ.)*	4 ms
Bounce time (typ.)	NO: 2 ms / NC: 15 ms
Shock resistance (16 ms) (min.)	NO: 10g / NC: 10g
Vibration resistance (10-200 Hz) (min.)	NO: 10g / NC: 4g
Weight	approx. 30 g
Mounting position	any
Mounting distance (min.)	1 mm

* without coil wiring

Other Data

Ambient temperature	-40 °C, ..., +85 °C
Thermal resistance	45 K / W
Protection class	RT III
Solder bath temperature	270 °C / 5 s
Test method (heating)	A (group assembly)
Approvals	cULus, TÜV
Flammability class	UL 94 V-0
UL File	E188953 Sec. 5

Options, Accessories

Other pin lengths	possible
Other coil designs	possible
Coils accord. to EN 50155 (railway applications)	possible

Product key

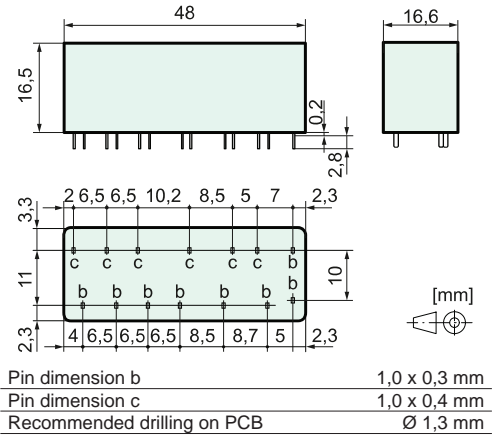
SIS	3	1	2	24VDC	SEN	XX
SIS	Type designation					
3	Number of contacts NO					
1	Number of contacts NC					
2	Connection technology					
24VDC	Nominal coil voltage					
SEN	sensitive coil					
XX	Options					



Features

- Relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Suitable for print mounting
- Compact design
- Contact assembly
SIS422: 4 NO + 2 NC

Dimensions

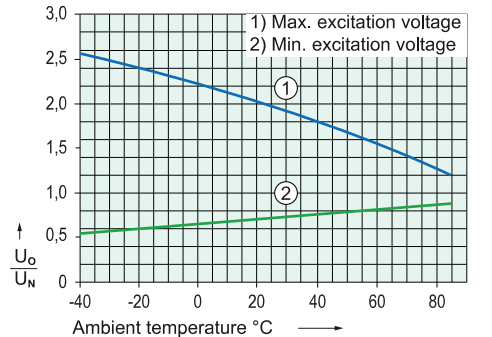


Coil data at 20 °C

Nominal power (typ.)	0,66 W
Holding power (typ.)	0,20 W
Coil limit temperature	120 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)	Resistance (Ohm)
5,0	3,5	0,5	133	38 (1 ± 10 %)
12,0	8,4	1,2	56	215 (1 ± 10 %)
18,0	12,6	1,8	37	485 (1 ± 10 %)
24,0	16,8	2,4	30	860 (1 ± 10 %)
48,0	33,6	4,8	14	3450 (1 ± 10 %)
60,0	42,0	6,0	11	5400 (1 ± 13 %)
110,0	77,0	11,0	6	18300 (1 ± 15 %)

Excitation voltage range



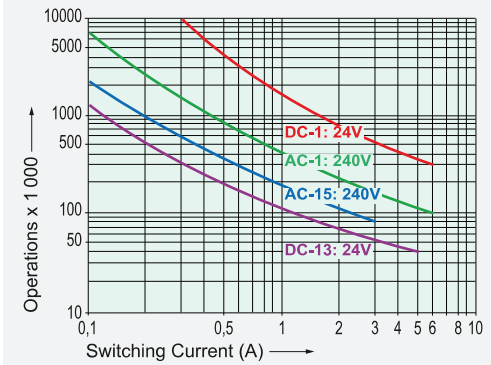
- Test conditions:
- Graph 1: Contact current 4 A MAX
 - Graph 2: without previous operation
 - Free-standing relay on PCB
 - Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power	1500 VA
250 V / 6 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	90000
Inrush current	30 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	3 mA, ..., 6 A
Switching power range*	40 mW, ..., 1500 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of contacts**	1000 A
with pre-fuse	SCPD 6 A gG / gL (fuse)

* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)



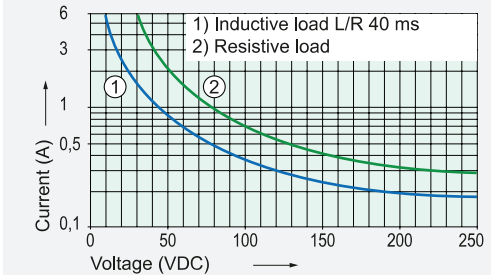
Switching capacity (IEC 61810-1)

AC-1:	240 V / 6 A MAX
AC-15:	240 V / 3 A MAX
DC-1:	24 V / 6 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX

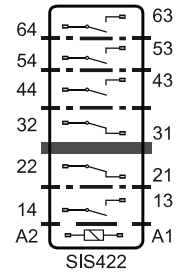
Switching capacity (UL 508)

Continuous current per contact at load of:	B300, R300
1 or 2 contacts	6 A MAX
3 contacts	4 A MAX
4 contacts	3 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	4 mm
- Air and creepage distance (min.)	4 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	5,5 mm
- Air and creepage distance (min.)	5,5 mm
- Test voltage	4000 V _{rms} / 1 min
Double or reinforced insulation	8 mm
- Air and creepage distance (min.)	8 mm
- Test voltage	4000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Creepage resistance	CTI 175
Pollution degree	2
Overvoltage category	III
Insulation resistance (min.)	100 MΩ
- Test voltage	500 VDC

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	15 ms
Drop-out time (NC closed) (typ.)*	5 ms
Bounce time (typ.)	NO: 2 ms / NC: 15 ms
Shock resistance (16 ms) (min.)	NO: 10g / NC: 9g
Vibration resistance (10-200 Hz) (min.)	NO: 10g / NC: 3g
Weight	approx. 35 g
Mounting position	any
Mounting distance (min.)	1 mm

* without coil wiring

Other data

Ambient temperature	-40 °C, ..., +85 °C
Thermal resistance	45 K / W
Protection class	RT III
Solder bath temperature	270 °C / 5 s
Test method (heating)	A (group assembly)
Approvals	cULus, TÜV
Flammability class	UL 94 V-0
UL File	E188953 Sec. 5

Options, Accessories

Other pin lengths	possible
Other coil designs	possible
Coils accord. to EN 50155 (railway applications)	possible

Product key

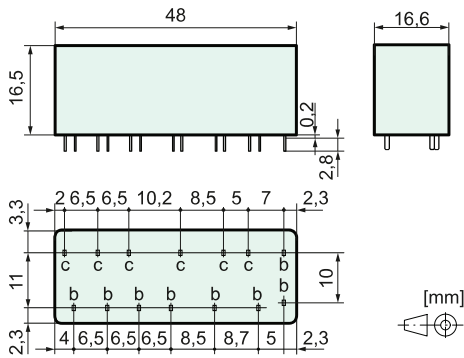
SIS	4	2	2	24VDC	XX
SIS	Type designation				
4	Number of contacts NO				
2	Number of contacts NC				
2	Connection technology	2 = Solder terminals			
24VDC	Nominal coil voltage				
XX	Options				



Features

- Relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Suitable for print mounting
- Compact design
- Low nominal and holding power
- Contact assembly
SIS422 SEN: 4 NO + 2 NC

Dimensions



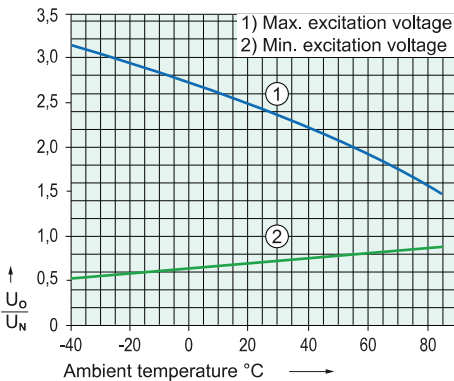
Pin dimension b	1,0 x 0,3 mm
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

Coil data at 20 °C

Nominal power (typ.)	0,44 W
Holding power (typ.)	0,10 W
Coil limit temperature	120 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)	Resistance (Ohm)
3,0	2,3	0,3	147	20 (1 ± 10 %)
5,0	3,8	0,5	89	56 (1 ± 10 %)
12,0	9,0	1,2	37	325 (1 ± 10 %)
18,0	13,3	1,8	24	740 (1 ± 10 %)
24,0	18,0	2,4	18	1300 (1 ± 10 %)
48,0	36,0	4,8	9	5200 (1 ± 13 %)
60,0	45,0	6,0	7	8150 (1 ± 15 %)

Excitation voltage range



Test conditions:

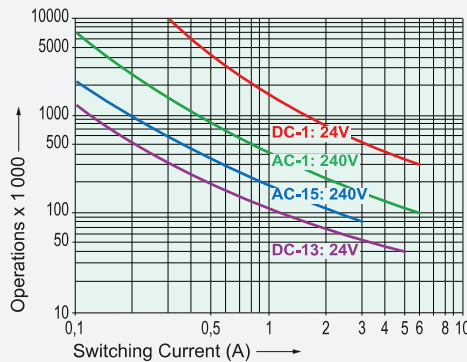
- Graph 1: Contact current 4 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power	1500 VA
250 V / 6 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	90000
Inrush current	30 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	3 mA, ..., 6 A
Switching power range*	40 mW, ..., 1500 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of contacts**	1000 A
with pre-fuse	SCPD 6 A gG / gL (fuse)

* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)



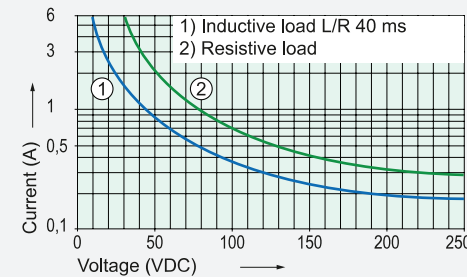
Switching capacity (IEC 61810-1)

AC-1:	240 V / 6 A MAX
AC-15:	240 V / 3 A MAX
DC-1:	24 V / 6 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX

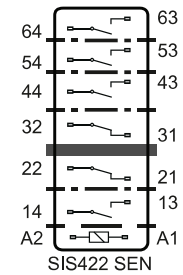
Switching capacity (UL 508)

Continuous current per contact at load of:	B300, R300
1 or 2 contacts	6 A MAX
3 contacts	4 A MAX
4 contacts	3 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	4 mm
- Air and creepage distance (min.)	4 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	5,5 mm
- Air and creepage distance (min.)	5,5 mm
- Test voltage	4000 V _{rms} / 1 min
Double or reinforced insulation	8 mm
- Air and creepage distance (min.)	8 mm
- Test voltage	4000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Creepage resistance	CTI 175
Pollution degree	2
Overvoltage category	III
Insulation resistance (min.)	100 MΩ
- Test voltage	500 VDC

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	20 ms
Drop-out time (NC closed) (typ.)*	4 ms
Bounce time (typ.)	NO: 2 ms / NC: 15 ms
Shock resistance (16 ms) (min.)	NO: 10g / NC: 9g
Vibration resistance (10-200 Hz) (min.)	NO: 10g / NC: 3g
Weight	approx. 35 g
Mounting position	any
Mounting distance (min.)	1 mm

* without coil wiring

Other data

Ambient temperature	-40 °C, ..., +85 °C
Thermal resistance	45 K / W
Protection class	RT III
Solder bath temperature	270 °C / 5 s
Test method (heating)	A (group assembly)
Approvals	cULus, TÜV
Flammability class	UL 94 V-0
UL File	E188953 Sec. 5

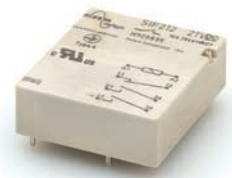
Options, Accessories

Other pin lengths	possible
Other coil designs	possible
Coils accord. to EN 50155 (railway applications)	possible

Product key

SIS 3 3 2 24VDC SEN XX

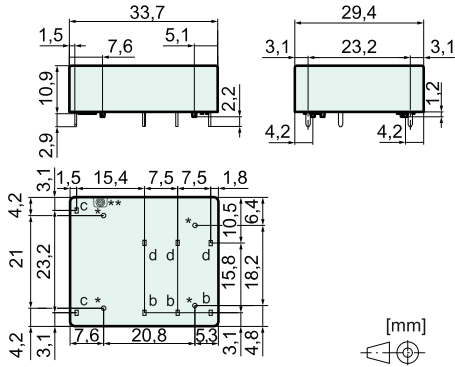
SIS	Type designation	
3	Number of contacts NO	
3	Number of contacts NC	
2	Connection technology	2 = Solder terminals
24VDC	Nominal coil voltage	
SEN	sensitive coil	
XX	Options	



Features

- Relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Suitable for print mounting
- SMD placement under the relay possible
- Height only 10,9 mm
- Contact assembly SIF212: 2 NO + 1 NC

Dimensions



* do not drill under the relay if SMD is mounted
** open vent stack

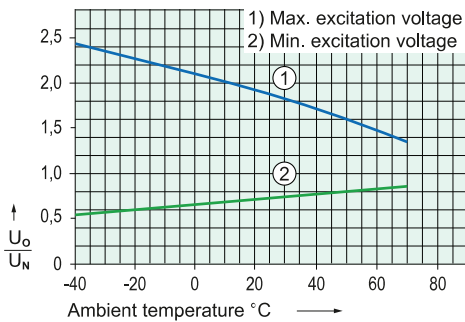
Pin dimension b	1,0 x 0,3 mm
Pin dimension c	1,0 x 0,4 mm
Pin dimension d	1,0 x 0,5 mm
Recommended drilling on PCB	Ø 1,3 mm

Coil data at 20 °C

Nominal power (typ.)	0,60 W
Holding power (typ.)	0,18 W
Coil limit temperature	120 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)	Resistance (Ohm)
5,0	3,5	0,5	120	42 (1 ± 10 %)
12,0	8,4	1,2	50	240 (1 ± 10 %)
18,0	12,6	1,8	33	540 (1 ± 10 %)
24,0	16,8	2,4	25	960 (1 ± 10 %)
48,0	33,6	4,8	13	3840 (1 ± 10 %)
60,0	42,0	6,0	10	6000 (1 ± 13 %)
110,0	77,0	11,0	5	20165 (1 ± 15 %)

Excitation voltage range



Test conditions:

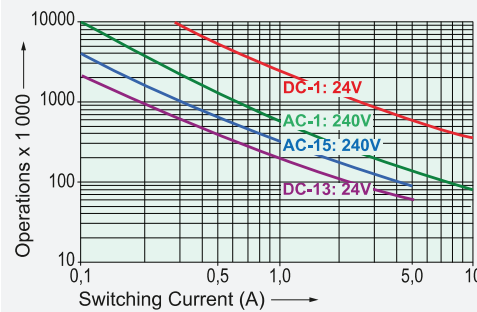
- Graph 1: Contact current 6 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power	2500 VA
250 V / 10 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100 000
Inrush current	30 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	3 mA, ..., 10 A
Switching power range*	40 mW, ..., 2500 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of NO contacts**	1000 A
with pre-fuse	SCPD 10 A gG / gL (fuse)
Short circuit resistance of NC contacts**	1000 A
with pre-fuse	SCPD 6 A gG / gL (fuse)

* Reference values ** Prospective short-circuit current

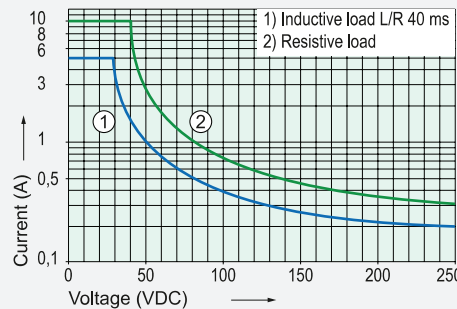
Electrical life (NO contacts)



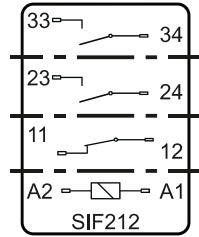
Switching capacity (IEC 61810-1)	
AC-1:	240 V / 10 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 10 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX

Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of:	
1 contact	10 A MAX
2 contacts	8 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Double or reinforced insulation	---
- Air and creepage distance (min.)	5,5 mm
- Test voltage	4000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Creepage resistance	CTI 175
Pollution degree	2
Overvoltage category	III
Insulation resistance (min.)	100 MΩ
- Test voltage	500 VDC

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	12 ms
Drop-out time (NC closed) (typ.)*	5 ms
Bounce time (typ.)	NO: 1,5 ms / NC: 15 ms
Shock resistance (16 ms) (min.)	NO: 15g / NC: 6g
Vibration resistance (10-200 Hz) (min.)	NO: 10g / NC: 2g
Weight	approx. 18 g
Mounting position	any
Mounting distance (min.)	5 mm

* without coil wiring

Other data

Ambient temperature	-40 °C, ..., +70 °C
Thermal resistance	60 K / W
Protection class	RT II
Solder bath temperature	270 °C / 5 s
Test method (heating)	A (group assembly)
Approvals	cULus, TÜV
Flammability class	UL 94 V-0
UL File	E188953 Sec.6

Options, Accessories

- Other coil designs possible
- Coils accord. to EN 50155 (railway applications) possible

Product key

SIF 2 1 2 24VDC XX

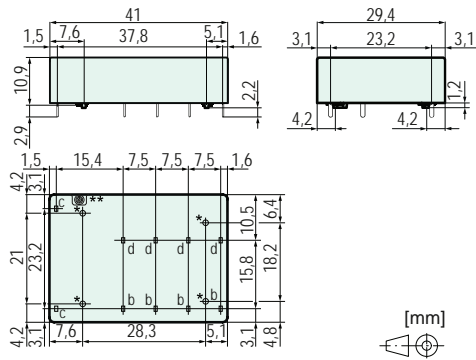
SIF	Type designation	
2	Number of contacts NO	
1	Number of contacts NC	
2	Connection technology	2 = Solder terminals
24VDC	Nominal coil voltage	
XX	Options	



Features

- Relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Suitable for print mounting
- SMD placement under the relay possible
- Height only 10,9 mm
- Contact assembly
SIF222: 2 NO + 2 NC, SIF312: 3 NO + 1 NC

Dimensions



* do not drill under the relay if SMD is mounted
** open vent stack

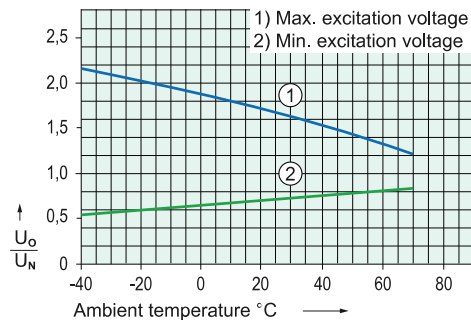
Pin dimension b	1,0 x 0,3 mm
Pin dimension c	1,0 x 0,4 mm
Pin dimension d	1,0 x 0,5 mm
Recommended drilling on PCB	Ø 1,3 mm

Coil data at 20 °C

Nominal power (typ.)	0,70 W
Holding power (typ.)	0,21 W
Coil limit temperature	120 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)	Resistance (Ohm)
5,0	3,5	0,5	140	36 (1 ± 10 %)
12,0	8,4	1,2	59	205 (1 ± 10 %)
18,0	12,6	1,8	39	460 (1 ± 10 %)
24,0	16,8	2,4	29	820 (1 ± 10 %)
48,0	33,6	4,8	15	3280 (1 ± 10 %)
60,0	42,0	6,0	12	5100 (1 ± 13 %)
110,0	77,0	11,0	6	17250 (1 ± 15 %)

Excitation voltage range



Test conditions:

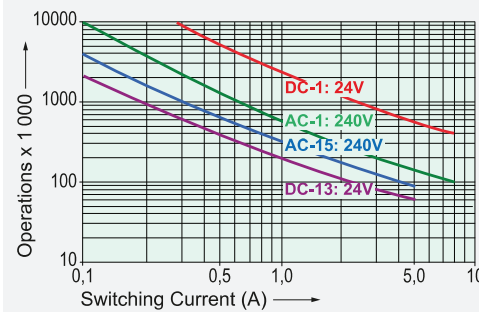
- Graph 1: Contact current 5 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power	2000 VA
250 V / 8 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100 000
Inrush current	30 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	3 mA, ..., 8 A
Switching power range*	40 mW, ..., 2000 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of NO contacts**	1000 A
with pre-fuse	SCPD 10 A gG / gL (fuse)
Short circuit resistance of NC contacts**	1000 A
with pre-fuse	SCPD 6 A gG / gL (fuse)

* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)



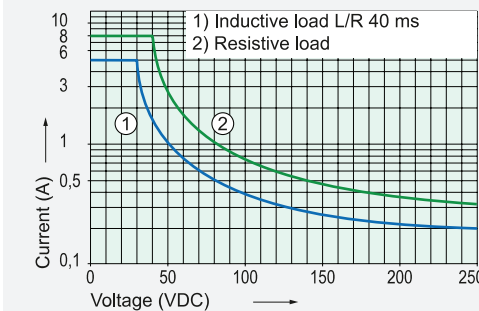
Switching capacity (IEC 61810-1)

AC-1:	240 V / 8 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 8 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX

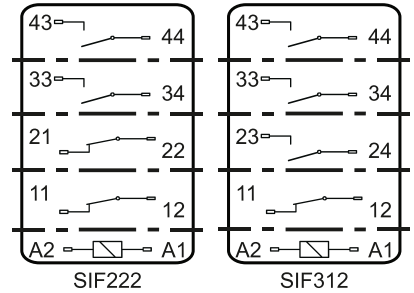
Switching capacity (UL 508)

Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of:	
1 or 2 contacts	8 A MAX
3 contacts	6 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Double or reinforced insulation	---
- Air and creepage distance (min.)	5,5 mm
- Test voltage	4000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Creepage resistance	CTI 175
Pollution degree	2
Overvoltage category	III
Insulation resistance (min.)	100 MΩ
- Test voltage	500 VDC

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	12 ms
Drop-out time (NC closed) (typ.)*	5 ms
Bounce time (typ.)	NO: 1,5 ms / NC: 15 ms
Shock resistance (16 ms) (min.)	NO: 15g / NC: 5g
Vibration resistance (10-200 Hz) (min.)	NO: 10g / NC: 2g
Weight	approx. 20 g
Mounting position	any
Mounting distance (min.)	5 mm

* without coil wiring

Other data

Ambient temperature	-40 °C, ..., +70 °C
Thermal resistance	60 K / W
Protection class	RT II
Solder bath temperature	270 °C / 5 s
Test method (heating)	A (group assembly)
Approvals	cULus, TÜV
Flammability class	UL 94 V-0
UL File	E188953 Sec.6

Options, Accessories

Other coil designs possible
Coils accord. to EN 50155 (railway applications) possible

Product key

SIF 3 1 2 24VDC XX

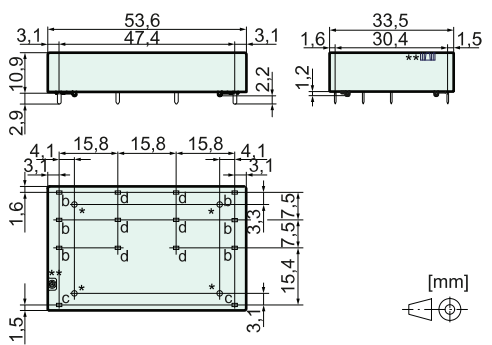
SIF	Type designation	
3	Number of contacts NO	
1	Number of contacts NC	
2	Connection technology	2 = Solder terminals
24VDC	Nominal coil voltage	
XX	Options	



Features

- Relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Suitable for print mounting
- SMD placement under the relay possible
- Height only 10,9 mm
- Contact assembly SIF422: 4 NO + 2 NC

Dimensions



* do not drill under the relay if SMD is mounted
** open vent stack

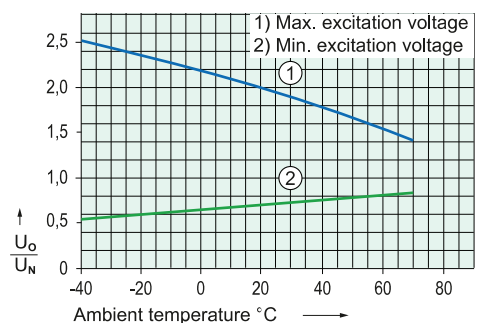
Pin dimension b	1,0 x 0,3 mm
Pin dimension c	1,0 x 0,4 mm
Pin dimension d	1,0 x 0,5 mm
Recommended drilling on PCB	Ø 1,3 mm

Coil data at 20 °C

Nominal power (typ.)	0,66 W
Holding power (typ.)	0,20 W
Coil limit temperature	120 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)	Resistance (Ohm)
5,0	3,5	0,5	133	38 (1 ± 10 %)
12,0	8,4	1,2	56	215 (1 ± 10 %)
18,0	12,6	1,8	39	490 (1 ± 10 %)
24,0	16,8	2,4	28	870 (1 ± 10 %)
48,0	33,6	4,8	14	3460 (1 ± 10 %)
60,0	42,0	6,0	11	5400 (1 ± 13 %)
110,0	77,0	11,0	6	18300 (1 ± 15 %)

Excitation voltage range



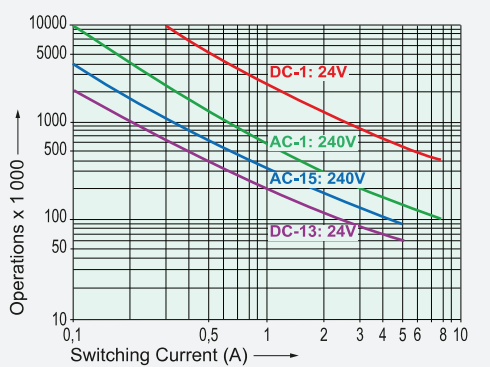
- Test conditions:
- Graph 1: Contact current 5 A MAX
 - Graph 2: without previous operation
 - Free-standing relay on PCB
 - Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power	2000 VA
250 V / 8 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100 000
Inrush current	30 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	3 mA, ..., 8 A
Switching power range*	40 mW, ..., 2000 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of NO contacts**	1 000 A with pre-fuse SCPD 10 A gG / gL (fuse)
Short circuit resistance of NC contacts**	1 000 A with pre-fuse SCPD 6 A gG / gL (fuse)

* Reference values ** Prospective short-circuit current

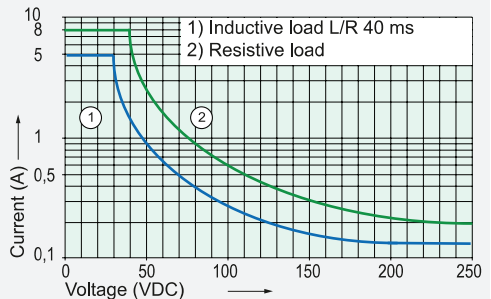
Electrical life (NO contacts)



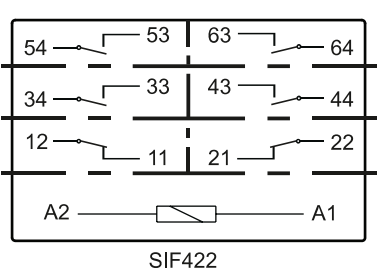
Switching capacity (IEC 61810-1)	
AC-1:	240 V / 8 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 8 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX

Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of:	
1 or 2 contacts	8 A MAX
3 contacts	6 A MAX
4 contacts	4,5 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Double or reinforced insulation	-----
- Air and creepage distance (min.)	5,5 mm
- Test voltage	4000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Creepage resistance	CTI 175
Pollution degree	2
Overvoltage category	III
Insulation resistance (min.)	100 MΩ
- Test voltage	500 VDC

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	20 ms
Drop-out time (NC closed) (typ.)*	8 ms
Bounce time (typ.)	NO: 1,5 ms / NC: 15 ms
Shock resistance (16 ms) (min.)	NO: 10g / NC: 6g
Vibration resistance (10-200 Hz) (min.)	NO: 10g / NC: 2g
Weight	approx. 35 g
Mounting position	any
Mounting distance (min.)	5 mm

* without coil wiring

Other data

Ambient temperature	-40 °C, ..., +70 °C
Thermal resistance	47 K / W
Protection class	RT II
Solder bath temperature	270 °C / 5 s
Test method (heating)	A (group assembly)
Approvals	cULus, TÜV
Flammability class	UL 94 V-0
UL File	E188953 Sec.6

Options, Accessories

- Other coil versions possible
- Coils accord. to EN 50155 (railway applications) possible

Product key

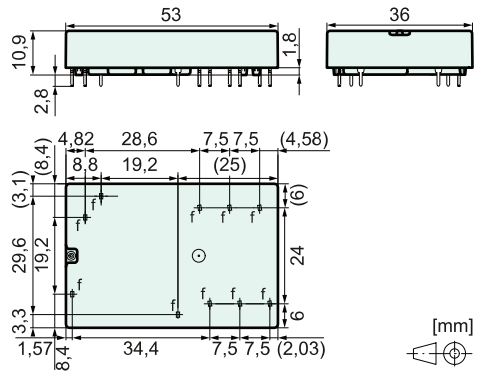
SIF	4	2	2	24VDC	XX
SIF	Type designation				
4	Number of contacts NO				
2	Number of contacts NC				
2	Connection technology				2 = Solder terminals
24VDC	Nominal coil voltage				
XX	Options				



Features

- Relay with forcibly guided contacts according to IEC 61810-3, Application type A
- Protective separation (see insulation data)
- Suitable for print mounting
 - With solder connections
 - With ELO pins for press-fit technology
- Double armature relay with 2 contacts in series per path
- Dual-channel capability with only one relay possible
- SMD placement under the relay possible
- Height only 10,9 mm
- Contact assembly
SID312/SID314: 3 NO + 1 NC

Dimensions



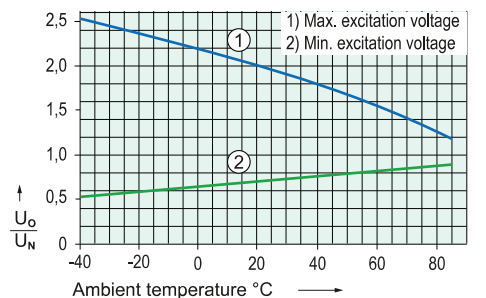
Pin dimension f 0,7 x 0,6 mm
 Recomm. drilling on PCB \varnothing 1,2 mm for solder connections
 Recomm. drilling on PCB* \varnothing 1,0 mm + 0,09 / - 0,06 mm for ELO pins
 * with HAL surface, for other surfaces on request

Coil data at 20 °C

Nominal power (typ.)	0,82 W
Holding power (typ.)	0,25 W
Coil limit temperature	120 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)	Resistance (Ohm)
5,0	3,5	0,5	161	31 (1 ± 10 %)
12,0	8,4	1,2	69	173 (1 ± 10 %)
18,0	12,6	1,8	46	396 (1 ± 10 %)
24,0	16,8	2,4	33	736 (1 ± 10 %)
48,0	33,6	4,8	16	2990 (1 ± 10 %)
60,0	42,0	6,0	13	4570 (1 ± 10 %)
110,0	77,0	11,0	8	14660 (1 ± 10 %)

Excitation voltage range



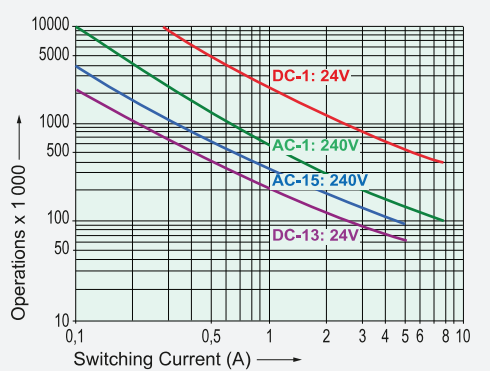
Test conditions:
 - Graph 1: Contact current 5 A MAX
 - Graph 2: without previous operation
 - Free-standing relay on PCB
 - Duty cycle 100%

Contact data

Contact material	AgSnO ₂ + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power	2000 VA
250 V / 8 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100 000
Inrush current	30 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	3 mA, ..., 8 A
Switching power range*	40 mW, ..., 2000 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of NO contacts**	1 000 A
with pre-fuse	SCPD 10 A gG / gL (fuse)
Short circuit resistance of NC contacts**	1 000 A
with pre-fuse	SCPD 6 A gG / gL (fuse)

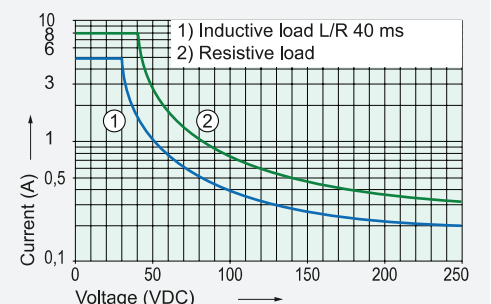
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

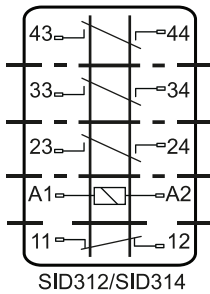


Switching capacity (IEC 61810-1)	240 V / 8 A MAX
AC-1:	240 V / 5 A MAX
AC-15:	24 V / 8 A MAX
DC-1:	24 V / 5 A / 0,1 Hz MAX
DC-13:	L/R = 40ms
Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of:	
1 or 2 contacts	8 A MAX
3 contacts	6 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	— — — — —
- Air and creepage distance (min.)	4 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	— — — — —
- Air and creepage distance (min.)	5,5 mm
- Test voltage	4000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Creepage resistance	CTI 250
Pollution degree	2
Overvoltage category	III
Insulation resistance (min.)	100 MΩ
- Test voltage	500 VDC

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	8 Hz
Response time (NO closed) (typ.)	20 ms
Drop-out time (NC closed) (typ.)*	5 ms
Bounce time (typ.)	NO: 2 ms / NC: 20 ms
Shock resistance (16 ms) (min.)	NO: 15g / NC: 5g
Vibr. resistance (10-200 Hz) (min.)	NO: 10g / NC: 1,5g
Weight	approx. 33,6 g
Mounting position	any
Mounting distance (min.)	5 mm

* without coil wiring

Other data

Ambient temperature	-40 °C, ..., +85 °C
Thermal resistance	40 K / W
Protection class	RT II
Solder bath temperature	270 °C / 5 s
Test method (heating)	A (group assembly)
Approvals	cULus, TÜV
Flammability class	UL 94 V-0
UL File	E188953 Sec. 6

Options, Accessories

Other coil designs	possible
Connection technologies	Solder connections, ELO pins

Product key

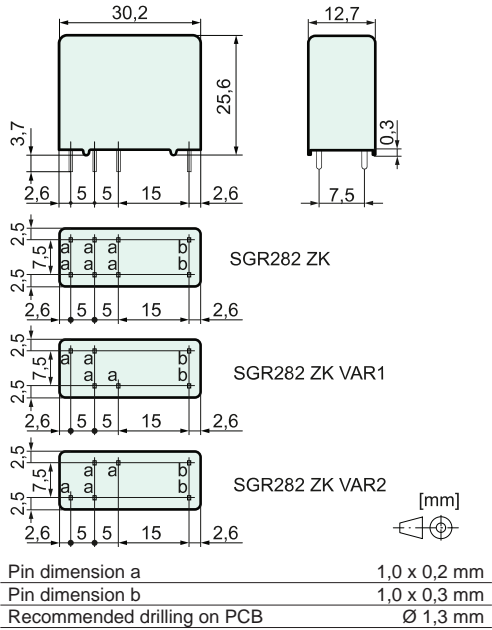
SID	3 1 2 24VDC XX	
SID	Type designation	
3	Number of contacts NO	
1	Number of contacts NC	
2	Connection technology	2 = Solder connections, 4 = ELO pins
24VDC	Nominal coil voltage	
XX	Options	



Features

- Relay with forcibly guided contacts according to IEC 61810-3
- Application type B and application type A (for VAR1 and VAR2)
- Protective separation (see insulation data)
- Suitable for print mounting
- Contact assembly
SGR282 ZK: 2 CO,
SGR282 ZK VAR1 / VAR2: 1 NO + 1 NC

Dimensions

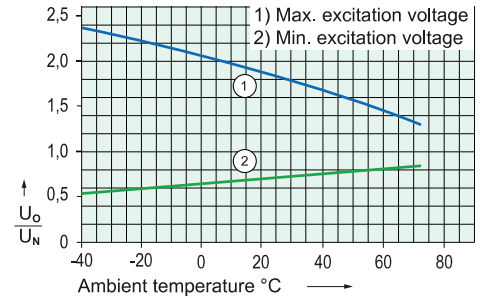


Coil data at 20 °C

Nominal power (typ.)	0,70 W
Holding power (typ.)	0,21 W
Coil limit temperature	120 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)	Resistance (Ohm)
5,0	3,8	0,5	140	36 (1 ± 10 %)
12,0	9,0	1,2	59	205 (1 ± 10 %)
18,0	13,5	1,8	39	462 (1 ± 10 %)
24,0	18,0	2,4	29	822 (1 ± 10 %)
48,0	36,0	4,8	15	3290 (1 ± 10 %)
60,0	45,0	6,0	12	5140 (1 ± 13 %)
110,0	82,5	11,0	6	17280 (1 ± 15 %)

Excitation voltage range



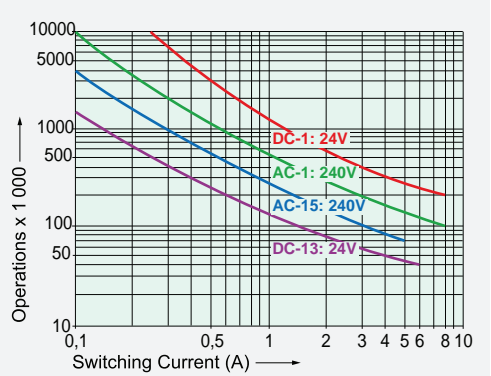
- Test conditions:
- Graph 1: Contact current 4 A MAX
 - Graph 2: without previous operation
 - Free-standing relay on PCB
 - Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power	2000 VA
250 V / 8 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100 000
Inrush current	15 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	4 mA, ..., 8 A
Switching power range*	50 mW, ..., 2000 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of NO contacts** with pre-fuse	1000 A SCPD 10 A gG / gL (fuse)
Short circuit resistance of NC contacts** with pre-fuse	1000 A SCPD 6 A gG / gL (fuse)

* Reference values ** Prospective short-circuit current

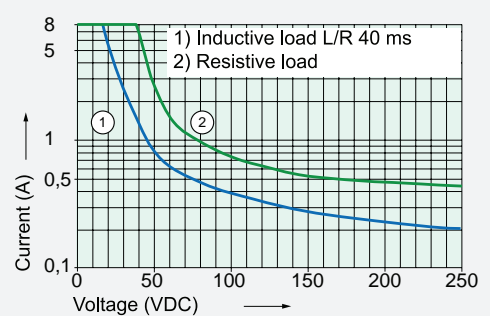
Electrical life (NO contacts)



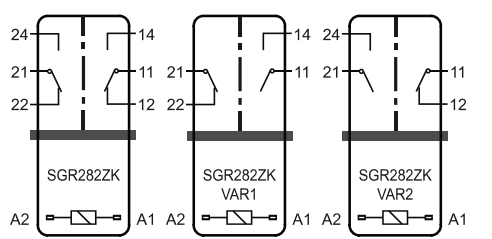
Switching capacity (IEC 61810-1)	240 V / 8 A MAX
AC-1:	240 V / 5 A MAX
AC-15:	24 V / 8 A MAX
DC-1:	24 V / 6 A / 0,1 Hz MAX
DC-13:	

Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of: 1 or 2 contacts	8 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Double or reinforced insulation	
- Air and creepage distance (min.)	5,5 mm
- Test voltage	4000 V _{rms} / 1 min
Double or reinforced insulation	
- Air and creepage distance (min.)	14 mm
- Test voltage	5000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Creepage resistance	CTI 550
Pollution degree	2
Overvoltage category	III
Insulation resistance (min.)	100 MΩ
- Test voltage	500 VDC

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	12 ms
Drop-out time (NC closed) (typ.)*	5 ms
Bounce time (typ.)	NO: 4 ms / NC: 8 ms
Shock resistance (16 ms) (min.)	NO: 10g / NC: 2,5g
Vibration resistance (10-200 Hz) (min.)	NO: 10g / NC: 1,5g
Weight	approx. 20 g
Mounting position	any
Mounting distance (min.)	5 mm

* without coil wiring

Other data

Ambient temperature	-40 °C, ..., +70 °C
Thermal resistance	50 K / W
Protection class	RT II
Solder bath temperature	270 °C / 5 s
Test method (heating)	A (group assembly)
Approvals	cULus, TÜV
Flammability class	UL 94 V-1
UL File	E188953 Sec.1

Options, Accessories

Mounting rail socket	SRD SGR2, SRD SGR2A KV2, SRD SGR2A KV2 PIK
PCB socket	SRP SGR2
Other coil designs	possible

Product key

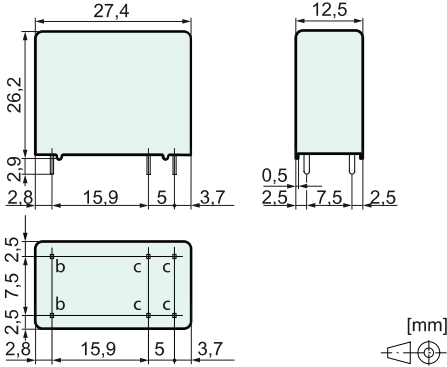
SGR282 ZK	Type designation	
VAR1	Contact variant	VAR1, VAR2
24VDC	Nominal coil voltage	
XX	Options	



Features

- Relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Suitable for print mounting
- Contact assembly
SIM112: 1 NO + 1 NC

Dimensions



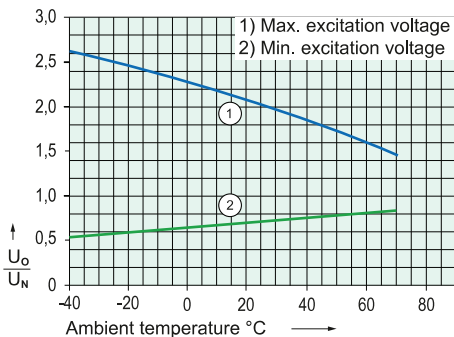
Pin dimension b	1,0 x 0,3 mm
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

Coil data at 20 °C

Nominal power	0,5 W
Holding power	0,15 W
Coil limit temperature	120 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)	Resistance (Ohm)
5,0	3,5	0,5	111	45 (1 ± 10 %)
12,0	8,4	1,2	44	270 (1 ± 10 %)
18,0	12,6	1,8	28	640 (1 ± 10 %)
24,0	16,8	2,4	29	1 100 (1 ± 10 %)
48,0	33,6	4,8	11	4 400 (1 ± 13 %)
60,0	42,0	6,0	9	6 850 (1 ± 15 %)
110,0	77,0	11,0	6	20 000 (1 ± 15 %)

Excitation voltage range



Test conditions:

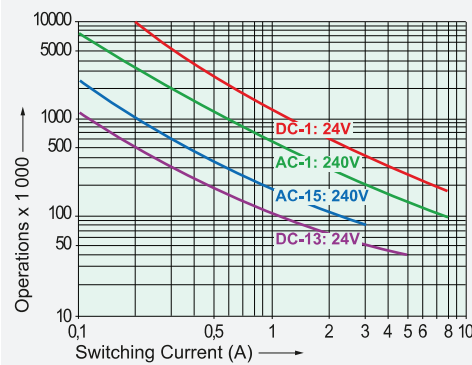
- Graph 1: Contact current 6 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgSnO ₂ + 0,2, ..., 0,4 µm Au
Contact type	crown contact
Rated switching power	2000 VA
250 V / 8 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100 000
Inrush current	20 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	10 mA, ..., 8 A
Switching power range*	60 mW, ..., 2000 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of contacts**	1 000 A
with pre-fuse	SCPD 10 A gG / gL (fuse)

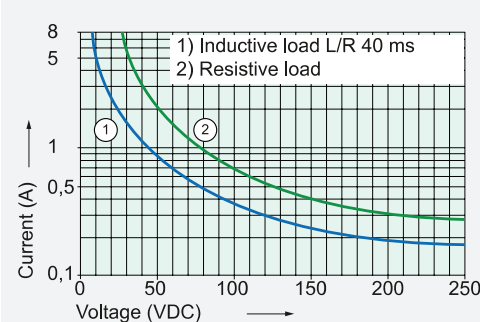
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

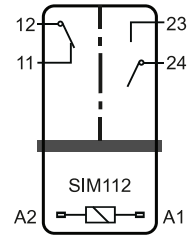


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 8 A MAX
AC-15:	240 V / 3 A MAX
DC-1:	24 V / 8 A MAX
DC-13:	24 V / 6 A / 0,1 Hz MAX
Switching capacity (UL 508)	C150, R300
Continuous current per contact at load of:	
1 contact	8 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Double or reinforced insulation	---
- Air and creepage distance (min.)	5,5 mm
- Test voltage	4 000 V _{rms} / 1 min
Double or reinforced insulation	---
- Air and creepage distance (min.)	14 mm
- Test voltage	5 000 V _{rms} / 1 min
Open contact: Test voltage*	1 500 V _{rms} / 1 min
Creepage resistance	CTI 250
Pollution degree	2
Overvoltage category	III
Insulation resistance (min.)	100 MΩ
- Test voltage	500 VDC

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	10 ms
Drop-out time (NC closed) (typ.)*	3 ms
Bounce time (typ.)	NO: 6 ms / NC: 12 ms
Shock resistance (16 ms) (min.)	NO: 10g / NC: 2,5g
Vibration resistance (10-200 Hz) (min.)	NO: 10g / NC: 1g
Weight	approx. 20 g
Mounting position	any
Mounting distance (min.)	5 mm

* without coil wiring

Other data

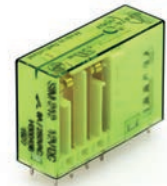
Ambient temperature	-40 °C, ..., +70 °C
Thermal resistance	55 K / W
Protection class	RT II
Solder bath temperature	270 °C / 5 s
Test method (heating)	A (group assembly)
Approvals	cULus, TÜV
Flammability class	UL 94 V-0
UL File	E188953 Sec. 3

Options, Accessories

Other coil designs	possible
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Product key

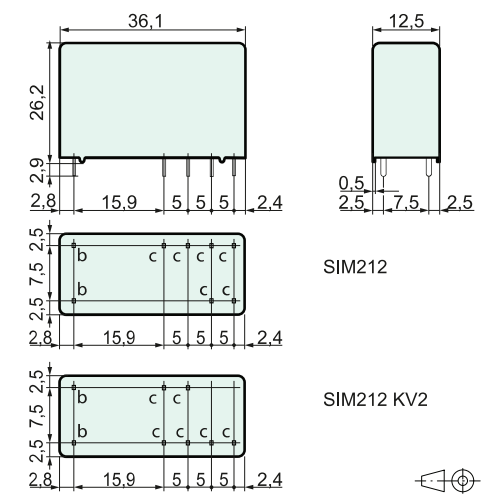
SIM	1	1	2	24VDC	XX
SIM	Type designation				
1	Number of contacts NO				
1	Number of contacts NC				
2	Connection technology				
24VDC	Nominal coil voltage				
XX	Options				



Features

- Relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Suitable for print mounting
- Contact assembly
SIM212: 2 NO + 1 NC

Dimensions



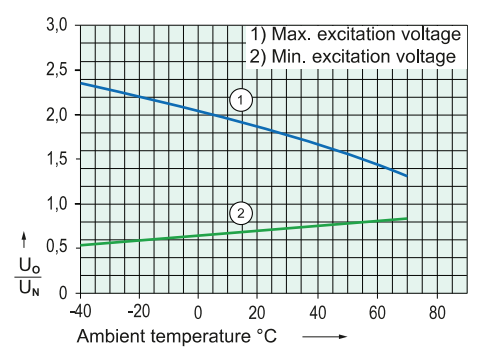
Pin dimension b	1,0 x 0,3 mm
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

Coil data at 20 °C

Nominal power (typ.)	0,75 W
Holding power (typ.)	0,21 W
Coil limit temperature	120 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)	Resistance (Ohm)
5,0	3,8	0,5	151	33 (1 ± 10 %)
12,0	9,0	1,2	63	190 (1 ± 10 %)
18,0	13,3	1,8	40	450 (1 ± 10 %)
24,0	18,0	2,4	30	800 (1 ± 10 %)
48,0	36,0	4,8	15	3100 (1 ± 10 %)
60,0	45,0	6,0	13	4800 (1 ± 13 %)
110,0	82,5	11,0	7	16000 (1 ± 15 %)

Excitation voltage range



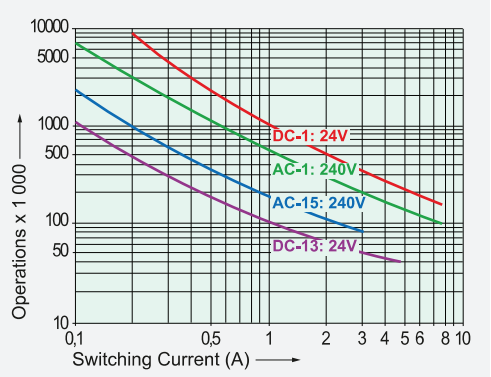
- Test conditions:
- Graph 1: Contact current 6 A MAX
 - Graph 2: without previous operation
 - Free-standing relay on PCB
 - Duty cycle 100%

Contact data

Contact material	AgSnO ₂ + 0,2, ..., 0,4 µm Au
Contact type	crown contact
Rated switching power	2000 VA
250 V / 8 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100 000
Inrush current	20 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	10 mA, ..., 8 A
Switching power range*	60 mW, ..., 2000 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of contacts**	1 000 A
with pre-fuse	SCPD 10 A gG / gL (fuse)

* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

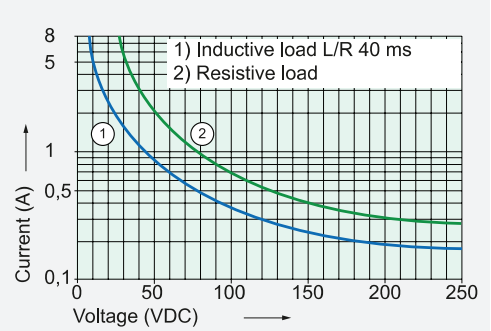


Switching capacity (IEC 61810-1)

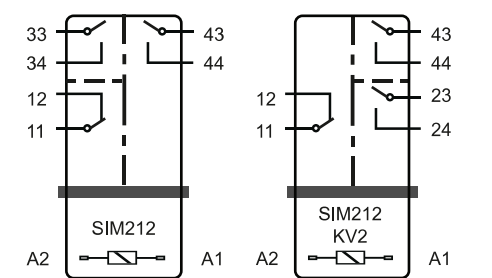
AC-1:	240 V / 8 A MAX
AC-15:	240 V / 3 A MAX
DC-1:	24 V / 8 A MAX
DC-13:	24 V / 6 A / 0,1 Hz MAX

Switching capacity (UL 508)	C150, R300
Continuous current per contact at load of: 1 or 2 contacts	8 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	4 mm
- Air and creepage distance (min.)	4 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	5,5 mm
- Air and creepage distance (min.)	5,5 mm
- Test voltage	4000 V _{rms} / 1 min
Double or reinforced insulation	14 mm
- Air and creepage distance (min.)	14 mm
- Test voltage	5000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Creepage resistance	CTI 250
Pollution degree	2
Overvoltage category	III
Insulation resistance (min.)	100 MΩ
- Test voltage	500 VDC

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	10 ms
Drop-out time (NC closed) (typ.)*	4 ms
Bounce time (typ.)	NO: 6 ms / NC: 12 ms
Shock resistance (16 ms) (min.)	NO: 10g / NC: 2,5g
Vibration resistance (10-200 Hz) (min.)	NO: 10g / NC: 1g
Weight	approx. 25 g
Mounting position	any
Mounting distance (min.)	5 mm

* without coil wiring

Other data

Ambient temperature	-40 °C, ..., +70 °C
Thermal resistance	55 K / W
Protection class	RT II
Solder bath temperature	270 °C / 5 s
Test method (heating)	A (group assembly)
Approvals	cULus, TÜV
Flammability class	UL 94 V-0
UL File	E188953 Sec. 3

Options, Accessories

Mounting rail socket	SRD SIM4
PCB socket	SRP SIM4
Other coil designs	possible

Product key

SIM 2 1 2 24VDC XX

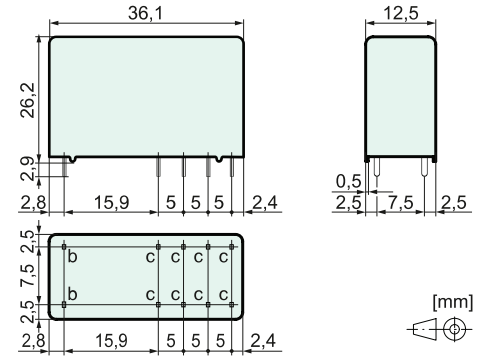
SIM	Type designation	
2	Number of contacts NO	
1	Number of contacts NC	
2	Connection technology	2 = Solder terminals
24VDC	Nominal coil voltage	
XX	Options	



Features

- Relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Suitable for print mounting
- Contact assembly
SIM312: 2 NO + 1 NC, SIM222: 2 NO + 2 NC

Dimensions



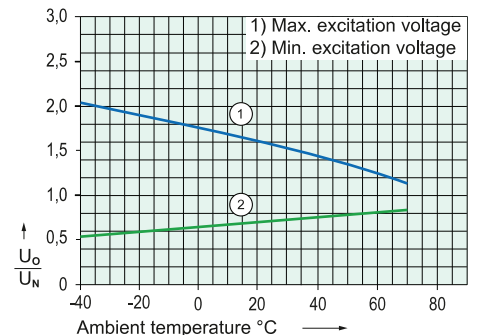
Pin dimension b	1,0 x 0,3 mm
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	∅ 1,3 mm

Coil data at 20 °C

Nominal power (typ.)	1,0 W
Holding power (typ.)	0,29 W
Coil limit temperature	120 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)	Resistance (Ohm)
5,0	3,8	0,5	182	28 (1 ± 10 %)
12,0	9,0	1,2	86	140 (1 ± 10 %)
18,0	13,3	1,8	55	330 (1 ± 10 %)
24,0	18,0	2,4	40	600 (1 ± 10 %)
48,0	36,0	4,8	21	2300 (1 ± 10 %)
60,0	45,0	6,0	17	3600 (1 ± 13 %)
110,0	82,5	11,0	9	12100 (1 ± 15 %)

Excitation voltage range



Test conditions:

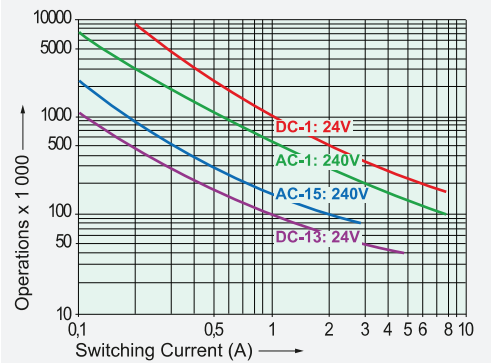
- Graph 1: Contact current 6 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgSnO ₂ + 0,2, ..., 0,4 μm Au
Contact type	crown contact
Rated switching power	2000 VA
250 V / 8 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100 000
Inrush current	20 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	10 mA, ..., 8 A
Switching power range*	60 mW, ..., 2000 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of contacts**	1 000 A
with pre-fuse	SCPD 10 A gG / gL (fuse)

* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)



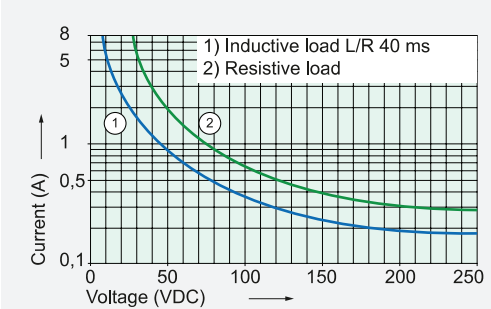
Switching capacity (IEC 61810-1)

AC-1:	240 V / 8 A MAX
AC-15:	240 V / 3 A MAX
DC-1:	24 V / 8 A MAX
DC-13:	24 V / 6 A / 0,1 Hz MAX

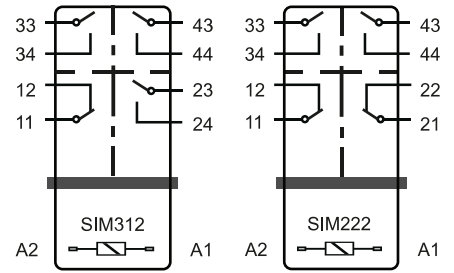
Switching capacity (UL 508)

Continuous current per contact at load of:	C150, R300
1 or 2 contacts	8 A MAX
3 contacts	6 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	4 mm
- Air and creepage distance (min.)	4 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	5,5 mm
- Air and creepage distance (min.)	5,5 mm
- Test voltage	4000 V _{rms} / 1 min
Double or reinforced insulation	14 mm
- Air and creepage distance (min.)	14 mm
- Test voltage	5000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Creepage resistance	CTI 250
Pollution degree	2
Overvoltage category	III
Insulation resistance (min.)	100 MΩ
- Test voltage	500 VDC

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	8 ms
Drop-out time (NC closed) (typ.)*	4 ms
Bounce time (typ.)	NO: 6 ms / NC: 12 ms
Shock resistance (16 ms) (min.)	NO: 10g / NC: 2,5g
Vibration resistance (10-200 Hz) (min.)	NO: 10g / NC: 1g
Weight	approx. 25 g
Mounting position	any
Mounting distance (min.)	5 mm

* without coil wiring

Other data

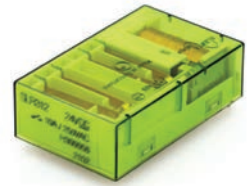
Ambient temperature	-40 °C, ..., +70 °C
Thermal resistance	50 K / W
Protection class	RT II
Solder bath temperature	270 °C / 5 s
Test method (heating)	A (group assembly)
Approvals	cULus, TÜV
Flammability class	UL 94 V-0
UL File	E188953 Sec. 3

Options, Accessories

Mounting rail socket	SRD SIM4
PCB socket	SRP SIM4
Other coil designs	possible

Product key

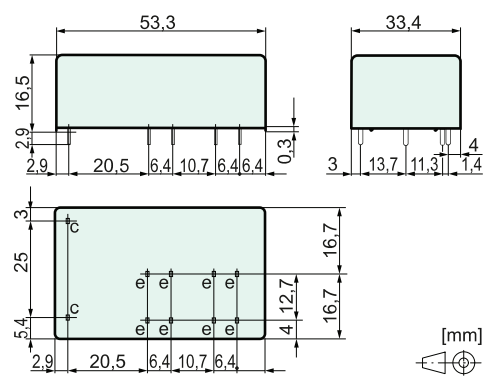
SIM	3	1	2	24VDC	XX
SIM	Type designation				
3	Number of contacts NO				
1	Number of contacts NC				
2	Connection technology				
24VDC	Nominal coil voltage				
XX	Options				



Features

- Relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Suitable for print mounting
- Height only 16,5 mm
- Contact assembly
SLR312: 3 NO + 1 NC, SLR222: 2 NO + 2 NC

Dimensions



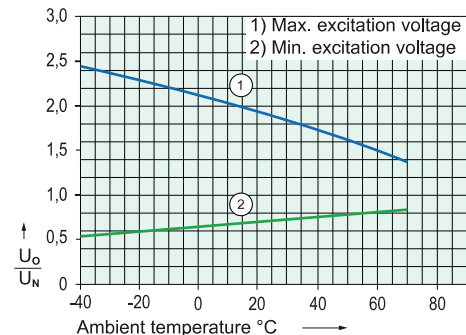
Pin dimension c	1,0 x 0,4 mm
Pin dimension e	1,0 x 0,6 mm
Recommended drilling on PCB	∅ 1,3 mm

Coil data at 20 °C

Nominal power (typ.)	0,6 W
Holding power (typ.)	0,18 W
Coil limit temperature	120 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)	Resistance (Ohm)
5,0	3,5	0,5	121	41 (1 ± 10 %)
12,0	8,4	1,2	50	240 (1 ± 10 %)
18,0	12,6	1,8	33	540 (1 ± 10 %)
24,0	16,8	2,4	25	950 (1 ± 10 %)
48,0	33,6	4,8	13	3800 (1 ± 10 %)
60,0	42,0	6,0	10	6000 (1 ± 13 %)
110,0	77,0	11,0	6	20000 (1 ± 15 %)

Excitation voltage range



Test conditions:

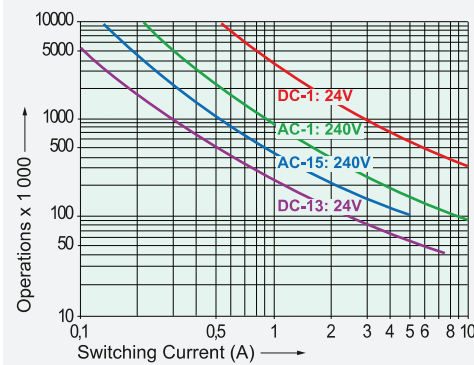
- Graph 1: Contact current 6 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgSnO ₂ + 0,2, ..., 0,4 μm Au
Contact type	crown contact
Rated switching power	2500 VA
250 V / 10 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100 000
Inrush current	25 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	10 mA, ..., 10 A
Switching power range*	60 mW, ..., 2500 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of contacts**	1 000 A
with pre-fuse	SCPD 10 A gG / gL (fuse)

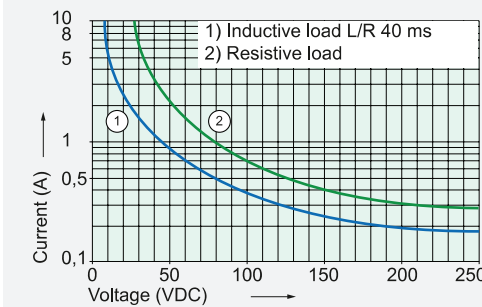
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

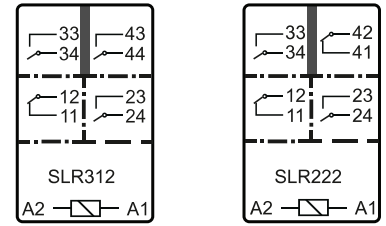


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 10 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 10 A MAX
DC-13:	24 V / 7,5 A / 0,1 Hz MAX
Switching capacity (UL 508)	C600, R300
Continuous current per contact at load of:	
1 or 2 contacts	10 A MAX
3 contacts	8,4 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	4 mm
- Air and creepage distance (min.)	4 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	8 mm
- Air and creepage distance (min.)	8 mm
- Test voltage	4000 V _{rms} / 1 min
Double or reinforced insulation	10 mm
- Air and creepage distance (min.)	10 mm
- Test voltage	5000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Creepage resistance	CTI 250
Pollution degree	2
Overvoltage category	III
Insulation resistance (min.)	100 MΩ
- Test voltage	500 VDC

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	15 ms
Drop-out time (NC closed) (typ.)*	4 ms
Bounce time (typ.)	NO: 6 ms / NC: 12 ms
Shock resistance (16 ms) (min.)	NO: 10g / NC: 6g
Vibration resistance (10-200 Hz) (min.)	NO: 5g / NC: 1,5g
Weight	approx. 30 g
Mounting position	any
Mounting distance (min.)	5 mm

* without coil wiring

Other data

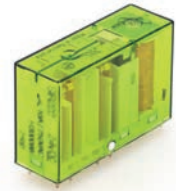
Ambient temperature	-40 °C, ..., +70 °C
Thermal resistance	55 K / W
Protection class	RT II
Solder bath temperature	270 °C / 5 s
Test method (heating)	A (group assembly)
Approvals	cULus, TÜV
Flammability class	UL 94 V-0
UL File	E188953 Sec. 3

Options, Accessories

Other coil designs	possible
Coils accord. to EN 50155 (railway applications)	possible

Product key

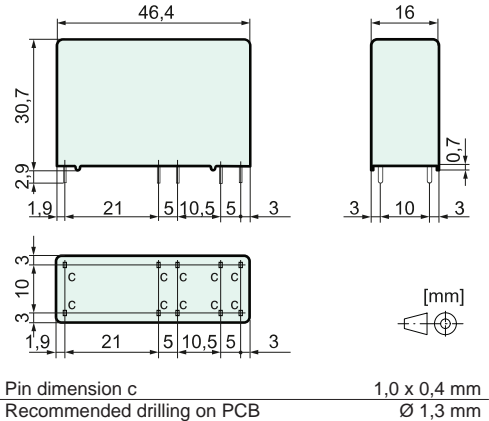
SLR	Type designation	
2	Number of contacts NO	
2	Number of contacts NC	
2	Connection technology	2 = Solder terminals
24VDC	Nominal coil voltage	
XX	Options	



Features

- Relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Suitable for print mounting
- Contact assembly
SIR312: 3 NO + 1 NC, SIR222: 2 NO + 2 NC

Dimensions

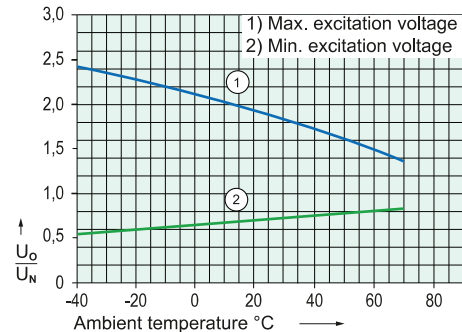


Coil data at 20 °C

Nominal power (typ.)	0,6 W
Holding power (typ.)	0,18 W
Coil limit temperature	120 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)	Resistance (Ohm)
5,0	3,5	0,5	121	41 (1 ± 10 %)
12,0	8,4	1,2	50	240 (1 ± 10 %)
18,0	12,6	1,8	33	540 (1 ± 10 %)
24,0	16,8	2,4	25	950 (1 ± 10 %)
48,0	33,6	4,8	13	3800 (1 ± 10 %)
60,0	42,0	6,0	10	6000 (1 ± 13 %)
110,0	77,0	11,0	6	20000 (1 ± 15 %)

Excitation voltage range



Test conditions:

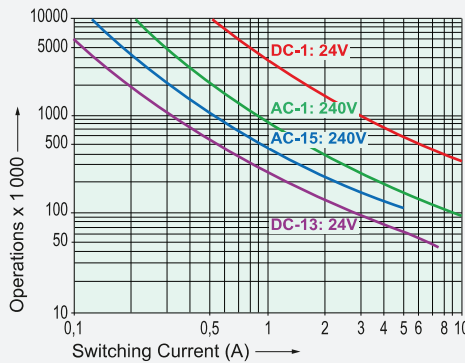
- Graph 1: Contact current 6 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgSnO ₂ + 0,2, ..., 0,4 µm Au
Contact type	crown contact
Rated switching power	2500 VA
250 V / 10 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100 000
Inrush current	25 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	10 mA, ..., 10 A
Switching power range*	60 mW, ..., 2500 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of contacts**	1 000 A
with pre-fuse	SCPD 10 A gG / gL (fuse)

* Reference values ** Prospective short-circuit current

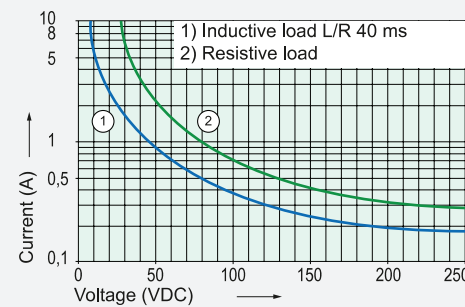
Electrical life (NO contacts)



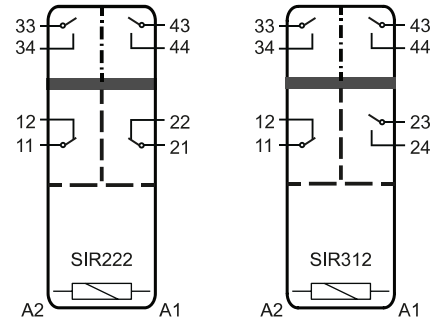
Switching capacity (IEC 61810-1)	
AC-1:	240 V / 10 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 10 A MAX
DC-13:	24 V / 7,5 A / 0,1 Hz MAX

Switching capacity (UL 508)	C600, R300
Continuous current per contact at load of:	
1 or 2 contacts	10 A MAX
3 contacts	8,4 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	4 mm
- Air and creepage distance (min.)	4 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	8 mm
- Air and creepage distance (min.)	8 mm
- Test voltage	4000 V _{rms} / 1 min
Double or reinforced insulation	10 mm
- Air and creepage distance (min.)	10 mm
- Test voltage	5000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Creepage resistance	CTI 250
Pollution degree	2
Overvoltage category	III
Insulation resistance (min.)	100 MΩ
- Test voltage	500 VDC

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	15 ms
Drop-out time (NC closed) (typ.)*	4 ms
Bounce time (typ.)	NO: 6 ms / NC: 12 ms
Shock resistance (16 ms) (min.)	NO: 10g / NC: 6g
Vibration resistance (10-200 Hz) (min.)	NO: 5g / NC: 1,5g
Weight	approx. 30 g
Mounting position	any
Mounting distance (min.)	5 mm

* without coil wiring

Other data

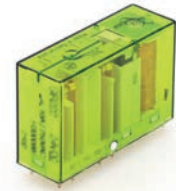
Ambient temperature	-40 °C, ..., +70 °C
Thermal resistance	55 K / W
Protection class	RT II
Solder bath temperature	270 °C / 5 s
Test method (heating)	A (group assembly)
Approvals	cULus, TÜV
Flammability class	UL 94 V-0
UL File	E188953 Sec. 3

Options, Accessories

PCB socket	SRP SIR4
Other coil designs	possible
Coils accord. to EN 50155 (railway applications)	possible

Product key

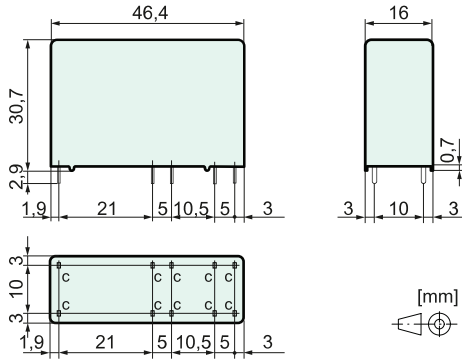
SIR	Type designation	
3	Number of contacts NO	
1	Number of contacts NC	
2	Connection technology	2 = Solder terminals
24VDC	Nominal coil voltage	
XX	Options	



Features

- Relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Suitable for print mounting
- Low nominal and holding power
- Contact assembly
SIR312 SEN: 2 NO + 1 NC, SIR222 SEN: 2 NO + 2 NC

Dimensions



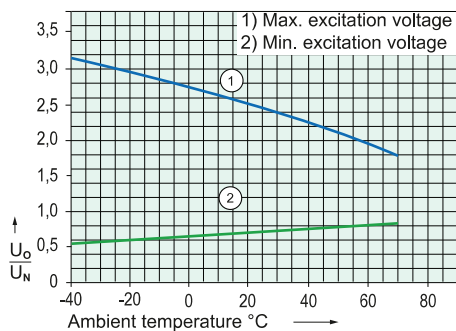
Pin dimension c 1,0 x 0,4 mm
Recommended drilling on PCB \varnothing 1,3 mm

Coil data at 20 °C

Nominal power (typ.)	0,36 W
Holding power (typ.)	0,12 W
Coil limit temperature	120 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)	Resistance (Ohm)
3,0	2,2	0,3	120	25 (1 ± 10 %)
5,0	3,8	0,5	72	69 (1 ± 10 %)
12,0	9,0	1,2	30	400 (1 ± 10 %)
18,0	13,5	1,8	20	900 (1 ± 10 %)
24,0	18,0	2,4	15	1600 (1 ± 10 %)
48,0	36,0	4,8	8	6400 (1 ± 13 %)
60,0	45,0	6,0	6	10000 (1 ± 15 %)

Excitation voltage range



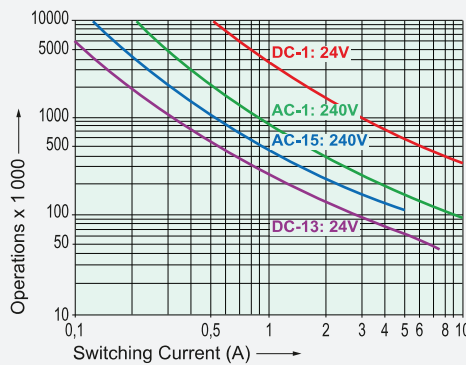
- Test conditions:
- Graph 1: Contact current 6 A MAX
 - Graph 2: without previous operation
 - Free-standing relay on PCB
 - Duty cycle 100%

Contact data

Contact material	AgSnO ₂ + 0,2, ..., 0,4 μm Au
Contact type	crown contact
Rated switching power	2500 VA
250 V / 10 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100 000
Inrush current	25 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	10 mA, ..., 10 A
Switching power range*	60 mW, ..., 2500 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of contacts**	1 000 A
with pre-fuse	SCPD 10 A gG / gL (fuse)

* Reference values ** Prospective short-circuit current

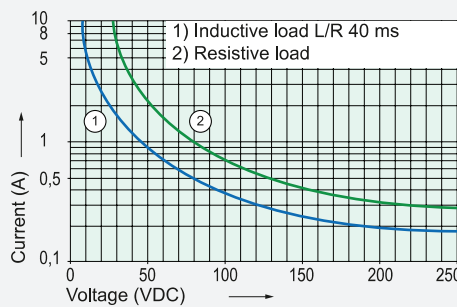
Electrical life (NO contacts)



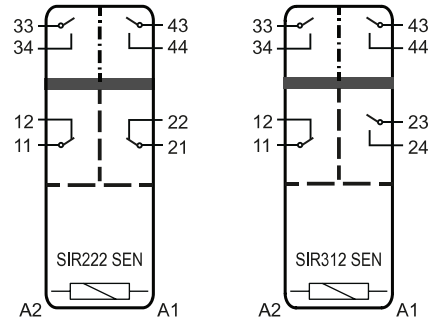
Switching capacity (IEC 61810-1)	
AC-1:	240 V / 10 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 10 A MAX
DC-13:	24 V / 7,5 A / 0,1 Hz MAX

Switching capacity (UL 508)	C600, R300
Continuous current per contact at load of:	
1 or 2 contacts	10 A MAX
3 contacts	8,4 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	4 mm
- Air and creepage distance (min.)	4 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	8 mm
- Air and creepage distance (min.)	8 mm
- Test voltage	4000 V _{rms} / 1 min
Double or reinforced insulation	10 mm
- Air and creepage distance (min.)	10 mm
- Test voltage	5000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Creepage resistance	CTI 250
Pollution degree	2
Overvoltage category	III
Insulation resistance (min.)	100 MΩ
- Test voltage	500 VDC

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	18 ms
Drop-out time (NC closed) (typ.)*	5 ms
Bounce time (typ.)	NO: 6 ms / NC: 12 ms
Shock resistance (16 ms) (min.)	NO: 10g / NC: 6g
Vibration resistance (10-200 Hz) (min.)	NO: 5g / NC: 1,5g
Weight	approx. 30 g
Mounting position	any
Mounting distance (min.)	5 mm

* without coil wiring

Other data

Ambient temperature	-40 °C, ..., +70 °C
Thermal resistance	55 K / W
Protection class	RT II
Solder bath temperature	270 °C / 5 s
Test method (heating)	A (group assembly)
Approvals	cULus, TÜV
Flammability class	UL 94 V-0
UL File	E188953 Sec. 3

Options, Accessories

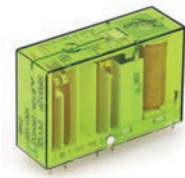
PCB socket	SRP SIR4
Other coil designs	possible
Coils accord. to EN 50155 (railway applications)	possible

Product key

SIR	Type designation	
3	Number of contacts NO	
1	Number of contacts NC	
2	Connection technology	2 = Solder terminals
24VDC	Nominal coil voltage	
SEN	sensitive coil	
XX	Options	

Relays

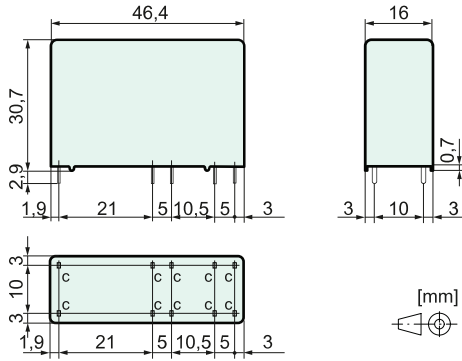
SIR4 Power Series



Features

- Relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Suitable for print mounting
- Inrush current 60 A / continuous current 12 A
- Contact assembly
SIR312 P: 3 NO + 1 NC, SIR222 P: 2 NO + 2 NC

Dimensions



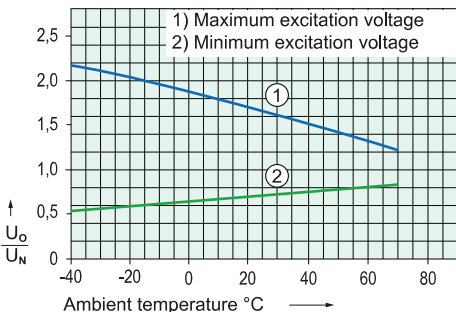
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

Coil data at 20 °C

Nominal power (typ.)	0,75 W
Holding power (typ.)	0,23 W
Coil limit temperature	120 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)	Resistance (Ohm)
5,0	3,5	0,5	151	33 (1 ± 10 %)
12,0	8,4	1,2	63	190 (1 ± 10 %)
18,0	12,6	1,8	42	432 (1 ± 10 %)
24,0	16,8	2,4	32	760 (1 ± 10 %)
48,0	33,6	4,8	16	3050 (1 ± 10 %)
60,0	42,0	6,0	13	4800 (1 ± 13 %)
110,0	77,0	11,0	7	16000 (1 ± 15 %)

Excitation voltage range



Test conditions:

- Graph 1: Contact current 10 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

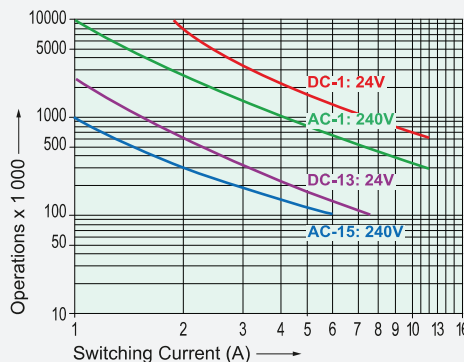
Contact resistance as new (max.)	100 mΩ
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Contact data apply to contacts 11-12, 21-22, 23-24	
Contact material	AgSnO ₂ + 0,2, ..., 0,4 μm Au
Contact type	crown contact
Rated switching power	1500 VA
250 V / 6 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100000
Inrush current	15 A for 20 ms
Switching voltage range	5 V, ..., 250 V DC / AC
Switching current range*	5 mA, ..., 6 A
Switching power range*	60 mW, ..., 1500 W (VA)
Short circuit resistance**	1000 A
with pre-fuse	SCPD 6 A gG / gL (fuse)
Electrical life, Switching capacity, Continuous current	see SIR4 series

Contact data apply to contacts 33-34, 43-44	
Contact material	AgSnO ₂
Contact type	single contact
Rated switching power	5760 VA
480 V / 12 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	250000
Inrush current	60 A for 20 ms
Switching voltage range	5 ... 250 VDC / 5 ... 480 VAC
Switching current range*	10 mA, ..., 12 A
Switching power range*	120 mW, ..., 3000 W (VA)
Short circuit resistance**	1000 A
with pre-fuse	SCPD 16 A gG / gL (fuse)

* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)



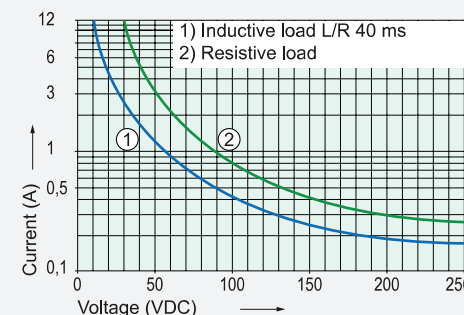
Switching capacity (IEC 61810-1)

AC-1:	240 V / 12 A MAX
AC-15:	240 V / 6 A MAX
DC-1:	24 V / 12 A MAX
DC-13:	24 V / 7,5 A / 0,1 Hz MAX

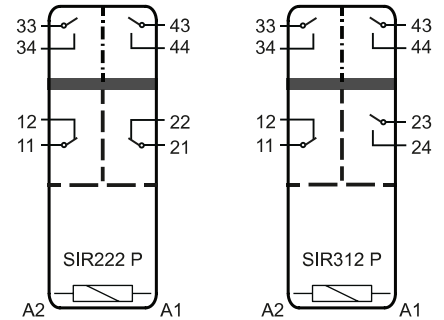
Switching capacity (UL 508)	C600, R300
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Continuous current per contact at load of: 1 or 2 contacts	12 A MAX
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Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	4 mm
- Air and creepage distance (min.)	4 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	8 mm
- Air and creepage distance (min.)	8 mm
- Test voltage	4000 V _{rms} / 1 min
Double or reinforced insulation	10 mm
- Air and creepage distance (min.)	10 mm
- Test voltage	5000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Creepage resistance	CTI 250
Pollution degree	2
Overvoltage category	III
Insulation resistance (min.)	100 MΩ
- Test voltage	500 VDC

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	15 ms
Drop-out time (NC closed) (typ.)*	4 ms
Bounce time (typ.)	NO: 6 ms / NC: 12 ms
Shock resistance (16 ms) (min.)	NO: 17g / NC: 7g
Vibr. resistance (10-200 Hz) (min.)	NO: 10g / NC: 4,5g
Weight	approx. 32 g
Mounting position	any
Mounting distance (min.)	5 mm

* without coil wiring

Other data

Ambient temperature	-40 °C, ..., +70 °C
Thermal resistance	55 K / W
Protection class	RT II
Solder bath temperature	270 °C / 5 s
Test method (heating)	A (group assembly)
Approvals	cULus, TÜV
Flammability class	UL 94 V-0
UL File	E188953 Sec. 3

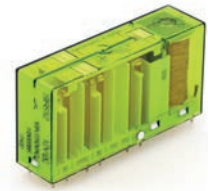
Options, Accessories

PCB socket	SRP SIR4
Other coil designs	possible
Coils accord. to EN 50155 (railway applications)	possible

Product key

SIR 2 2 2 P 24VDC XX

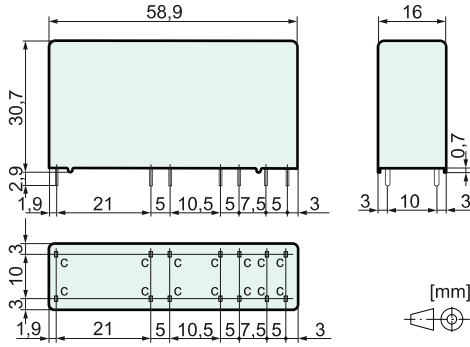
SIR	Type designation	
2	Number of contacts NO	
2	Number of contacts NC	
2	Connection technology	2 = Solder terminals
P	Power contacts	
24VDC	Nominal coil voltage	
XX	Options	



Features

- Relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Suitable for print mounting
- Small outer dimensions
- Contact assembly
- SIR332: 3 NO + 3 NC, SIR422: 4 NO + 2 NC, SIR512: 5 NO + 1 NC

Dimensions



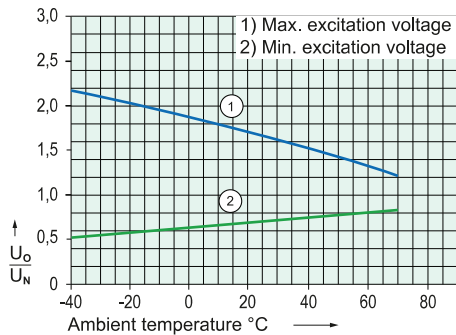
Pin dimension c 1,0 x 0,4 mm
Recommended drilling on PCB Ø 1,3 mm

Coil data at 20 °C

Nominal power (typ.)	0,75 W
Holding power (typ.)	0,22 W
Coil limit temperature	120 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)	Resistance (Ohm)
5,0	3,5	0,5	151	33 (1 ± 10 %)
12,0	8,4	1,2	63	190 (1 ± 10 %)
18,0	12,6	1,8	42	432 (1 ± 10 %)
24,0	16,8	2,4	32	760 (1 ± 10 %)
48,0	33,6	4,8	16	3050 (1 ± 10 %)
60,0	42,0	6,0	13	4800 (1 ± 13 %)
110,0	77,0	11,0	7	16000 (1 ± 15 %)

Excitation voltage range



Test conditions:

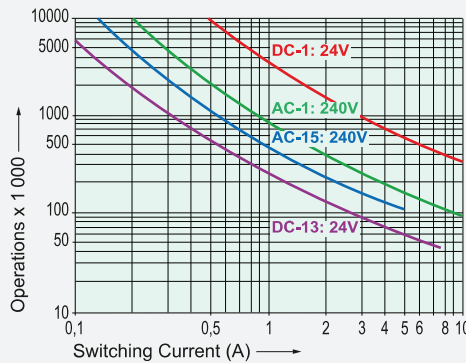
- Graph 1: Contact current 6 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgSnO ₂ + 0,2, ..., 0,4 µm Au
Contact type	crown contact
Rated switching power	2500 VA
250 V / 10 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100 000
Inrush current	25 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	10 mA, ..., 10 A
Switching power range*	60 mW, ..., 2500 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of contacts**	1 000 A with pre-fuse
	SCPD 10 A gG / gL (fuse)

* Reference values ** Prospective short-circuit current

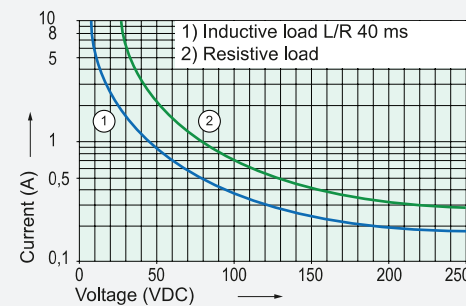
Electrical life (NO contacts)



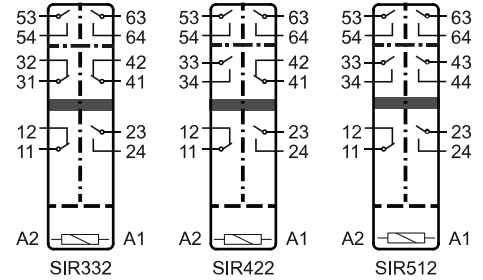
Switching capacity (IEC 61810-1)	
AC-1:	240 V / 10 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 10 A MAX
DC-13:	24 V / 7,5 A / 0,1 Hz MAX

Switching capacity (UL 508)	C600, R300
Continuous current per contact at load of:	
1 or 2 contacts	10 A MAX
3 contacts	8,4 A MAX
4 contacts	7,3 A MAX
5 contacts	6 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	
- Air and creepage distance (min.)	4 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	
- Air and creepage distance (min.)	8 mm
- Test voltage	4000 V _{rms} / 1 min
Double or reinforced insulation	
- Air and creepage distance (min.)	10 mm
- Test voltage	5000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Creepage resistance	CTI 250
Pollution degree	2
Overvoltage category	III
Insulation resistance (min.)	100 MΩ
- Test voltage	500 VDC

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	15 ms
Drop-out time (NC closed) (typ.)*	4 ms
Bounce time (typ.)	NO: 6 ms / NC: 12 ms
Shock resistance (16 ms) (min.)	NO: 10g / NC: 6g
Vibration resistance (10-200 Hz) (min.)	NO: 5g / NC: 2g
Weight	approx. 35 g
Mounting position	any
Mounting distance (min.)	5 mm

* without coil wiring

Other data

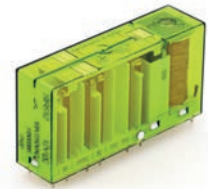
Ambient temperature	-40 °C, ..., +70 °C
Thermal resistance	55 K / W
Protection class	RT II
Solder bath temperature	270 °C / 5 s
Test method (heating)	A (group assembly)
Approvals	cULus, TÜV
Flammability class	UL 94 V-0
UL File	E188953 Sec. 3

Options, Accessories

Other coil designs	possible
Coils accord. to EN 50155 (railway applications)	possible

Product key

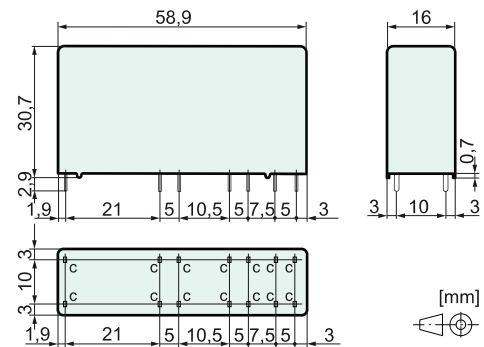
SIR	3	3	2	24VDC	XX
SIR	Type designation				
3	Number of contacts NO				
3	Number of contacts NC				
2	Connection technology	2 = Solder terminals			
24VDC	Nominal coil voltage				
XX	Options				



Features

- Relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Suitable for print mounting
- Small outer dimensions
- Low nominal and holding power
- Contact assembly
SIR332 SEN: 3 NO + 3 NC, SIR422 SEN: 4 NO + 2 NC, SIR512 SEN: 5 NO + 1 NC

Dimensions



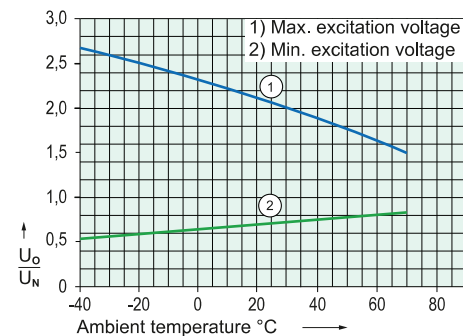
Pin dimension c 1,0 x 0,4 mm
Recommended drilling on PCB \varnothing 1,3 mm

Coil data at 20 °C

Nominal power	0,5 W
Holding power (typ.)	0,18 W
Coil limit temperature	120 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)	Resistance (Ohm)
3,0	2,2	0,3	166	18 (1 ± 10 %)
5,0	3,8	0,5	100	50 (1 ± 10 %)
12,0	9,0	1,2	42	288 (1 ± 10 %)
18,0	13,5	1,8	28	648 (1 ± 10 %)
24,0	18,0	2,4	21	1150 (1 ± 10 %)
48,0	36,0	4,8	10	4600 (1 ± 13 %)
60,0	45,0	6,0	8	7200 (1 ± 15 %)

Excitation voltage range



Test conditions:

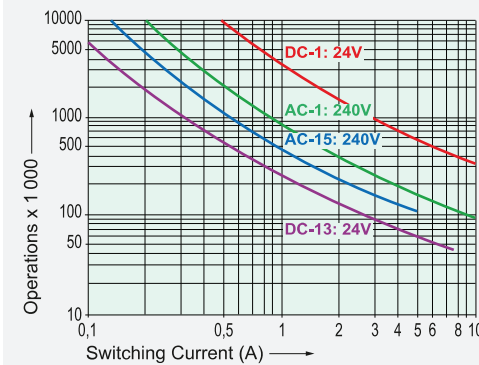
- Graph 1: Contact current 6 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgSnO ₂ + 0,2, ..., 0,4 μm Au
Contact type	crown contact
Rated switching power	2500 VA
250 V / 10 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100 000
Inrush current	25 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	10 mA, ..., 10 A
Switching power range*	60 mW, ..., 2500 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of contacts**	1 000 A
with pre-fuse	SCPD 10 A gG / gL (fuse)

* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)



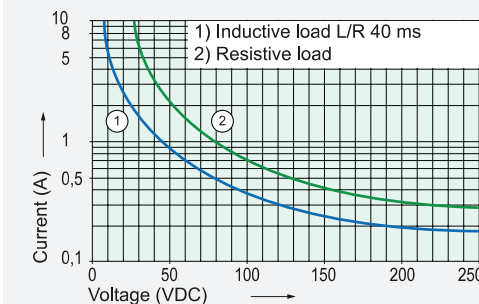
Switching capacity (IEC 61810-1)

AC-1:	240 V / 10 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 10 A MAX
DC-13:	24 V / 7,5 A / 0,1 Hz MAX

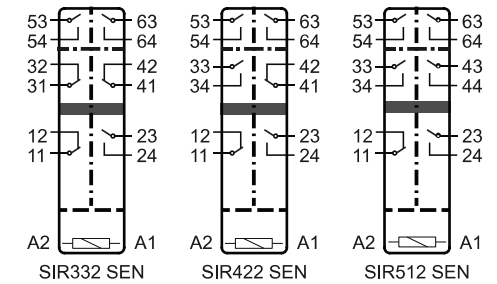
Switching capacity (UL 508)

Continuous current per contact at load of:	C600, R300
1 or 2 contacts	10 A MAX
3 contacts	8,4 A MAX
4 contacts	7,3 A MAX
5 contacts	6 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	4 mm
- Air and creepage distance (min.)	4 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	8 mm
- Air and creepage distance (min.)	8 mm
- Test voltage	4000 V _{rms} / 1 min
Double or reinforced insulation	10 mm
- Air and creepage distance (min.)	10 mm
- Test voltage	5000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Creepage resistance	CTI 250
Pollution degree	2
Overvoltage category	III
Insulation resistance (min.)	100 MΩ
- Test voltage	500 VDC

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	18 ms
Drop-out time (NC closed) (typ.)*	5 ms
Bounce time (typ.)	NO: 6 ms / NC: 12 ms
Shock resistance (16 ms) (min.)	NO: 10g / NC: 6g
Vibration resistance (10-200 Hz) (min.)	NO: 5g / NC: 2g
Weight	approx. 35 g
Mounting position	any
Mounting distance (min.)	5 mm

* without coil wiring

Other data

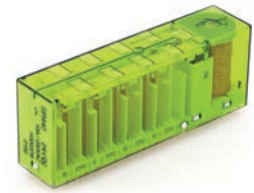
Ambient temperature	-40 °C, ..., +70 °C
Thermal resistance	55 K / W
Protection class	RT II
Solder bath temperature	270 °C / 5 s
Test method (heating)	A (group assembly)
Approvals	cULus, TÜV
Flammability class	UL 94 V-0
UL File	E188953 Sec. 3

Options, Accessories

Other coil designs	possible
Coils accord. to EN 50155 (railway applications)	possible

Product key

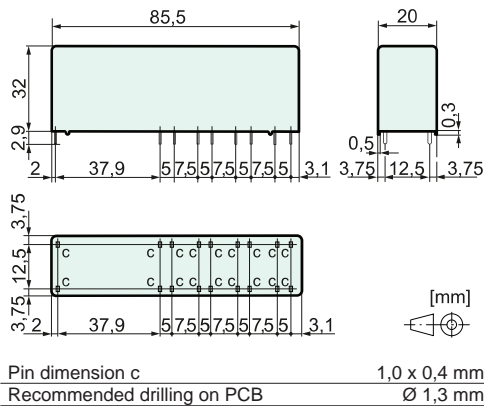
SIR	3	3	2	24VDC	SEN	XX
SIR	Type designation					
3	Number of contacts NO					
3	Number of contacts NC					
2	Connection technology	2 = Solder terminals				
24VDC	Nominal coil voltage					
SEN	sensitive coil					
XX	Options					



Features

- Relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Suitable for print mounting
- Small outer dimensions
- Contact mounting
- SIR262: 2 NO + 6 NC, SIR442: 4 NO + 4 NC, SIR622: 6 NO + 2 NC, SIR352: 3 NO + 5 NC, SIR532: 5 NO + 3 NC, SIR712: 7 NO + 1 NC

Dimensions

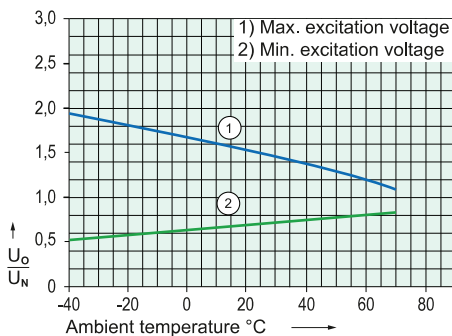


Coil data at 20 °C

Nominal power (typ.)	1,3 W
Holding power (typ.)	0,39 W
Coil limit temperature	120 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)	Resistance (Ohm)
5,0	3,5	0,5	260	19 (1 ± 10 %)
12,0	8,4	1,2	109	110 (1 ± 10 %)
18,0	12,6	1,8	72	250 (1 ± 10 %)
24,0	16,8	2,4	55	440 (1 ± 10 %)
48,0	33,6	4,8	27	1760 (1 ± 10 %)
60,0	42,0	6,0	12	2750 (1 ± 13 %)
110,0	77,0	11,0	7	9250 (1 ± 15 %)

Excitation voltage range



Test conditions:

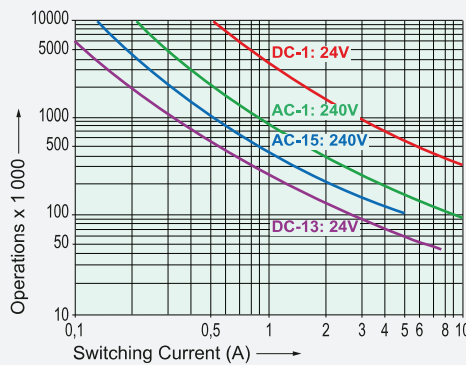
- Graph 1: Contact current 6 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgSnO ₂ + 0,2, ..., 0,4 µm Au
Contact type	crown contact
Rated switching power	2500 VA
250 V / 10 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100 000
Inrush current	25 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	10 mA, ..., 10 A
Switching power range*	60 mW, ..., 2500 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of contacts**	1 000 A
with pre-fuse	SCPD 10 A gG / gL (fuse)

* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)



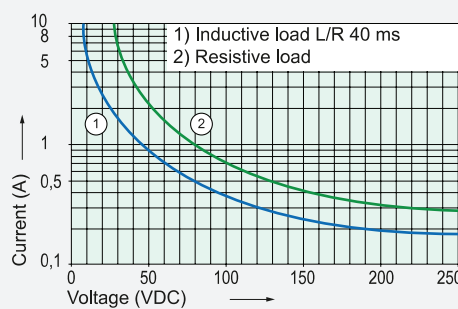
Switching capacity (IEC 61810-1)

AC-1:	240 V / 10 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 10 A MAX
DC-13:	24 V / 7,5 A / 0,1 Hz MAX

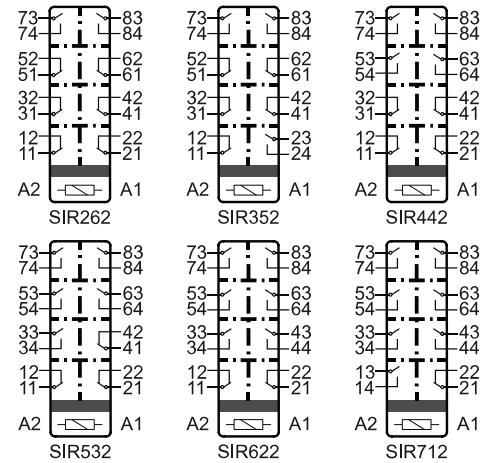
Switching capacity (UL 508)

Continuous current per contact at load of:	C600, R300
1 or 2 contacts	10 A MAX
3 contacts	8,4 A MAX
4 contacts	7,3 A MAX
5 contacts	6,5 A MAX
6 contacts	6 A MAX
7 contacts	5,5 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Double or reinforced insulation	
- Air and creepage distance (min.)	8 mm
- Test voltage	4000 V _{rms} / 1 min
Double or reinforced insulation	
- Air and creepage distance (min.)	10 mm
- Test voltage	5000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Creepage resistance	CTI 250
Pollution degree	2
Overvoltage category	III
Insulation resistance (min.)	100 MΩ
- Test voltage	500 VDC

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	15 ms
Drop-out time (NC closed) (typ.)*	4 ms
Bounce time (typ.)	NO: 6 ms / NC: 12 ms
Shock resistance (16 ms) (min.)	NO: 10g / NC: 6g
Vibration resistance (10-200 Hz) (min.)	NO: 8g / NC: 2,5g
Weight	approx. 60 g
Mounting position	any
Mounting distance (min.)	5 mm

* without coil wiring

Other data

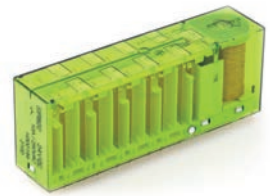
Ambient temperature	-40 °C, ..., +70 °C
Thermal resistance	40 K / W
Protection class	RT II
Solder bath temperature	270 °C / 5 s
Test method (heating)	A (group assembly)
Approvals	cULus, TÜV
Flammability class	UL 94 V-0
UL File	E188953 Sec. 3

Options, Accessories

Other coil designs	possible
Coils accord. to EN 50155 (railway applications)	possible

Product key

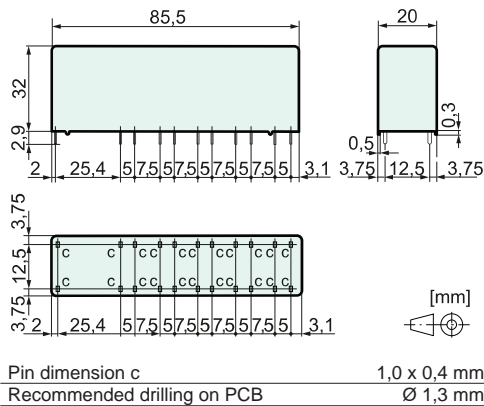
SIR	Type designation	
3	Number of contacts NO	
5	Number of contacts NC	
2	Connection technology	2 = Solder terminals
24VDC	Nominal coil voltage	
XX	Options	



Features

- Relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Suitable for print mounting
- Contact assembly:
SIR282: 2 NO + 8 NC, SIR372: 3 NO + 7 NC, SIR462: 4 NO + 6 NC, SIR552: 5 NO + 5 NC, SIR642: 6 NO + 4 NC, SIR732: 7 NO + 3 NC, SIR822: 8 NO + 2 NC, SIR912: 9 NO + 1 NC

Dimensions

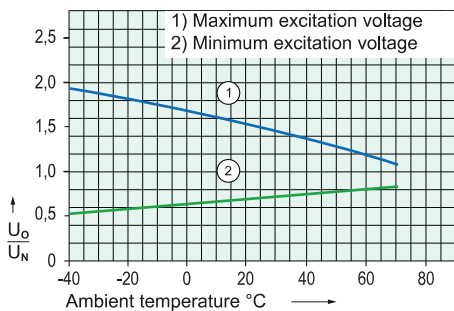


Coil data at 20 °C

Nominal power (typ.)	1,3 W
Holding power (typ.)	0,39 W
Coil limit temperature	120 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)	Resistance (Ohm)
5,0	3,5	0,5	260	19 (1 ± 10 %)
12,0	8,4	1,2	109	110 (1 ± 10 %)
18,0	12,6	1,8	72	250 (1 ± 10 %)
24,0	16,8	2,4	56	440 (1 ± 10 %)
48,0	33,6	4,8	27	1760 (1 ± 10 %)
60,0	42,0	6,0	12	2750 (1 ± 13 %)
110,0	77,0	11,0	7	9250 (1 ± 15 %)

Excitation voltage range



Test conditions:

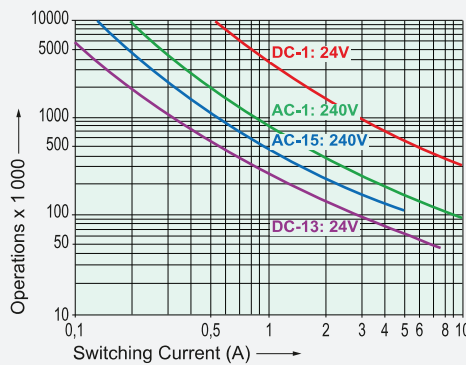
- Graph 1: Contact current 6 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgSnO ₂ + 0,2, ..., 0,4 µm Au
Contact type	crown contact
Rated switching power	2500 VA
250 V / 10 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100 000
Inrush current	25 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	10 mA, ..., 10 A
Switching power range*	60 mW, ..., 2500 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of contacts**	1 000 A
with pre-fuse	SCPD 10 A gG / gL (fuse)

* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)



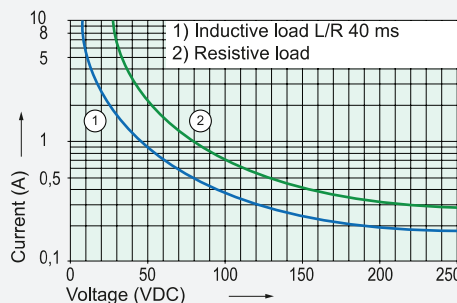
Switching capacity (IEC 61810-1)

AC-1:	240 V / 10 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 10 A MAX
DC-13:	24 V / 7,5 A / 0,1 Hz MAX

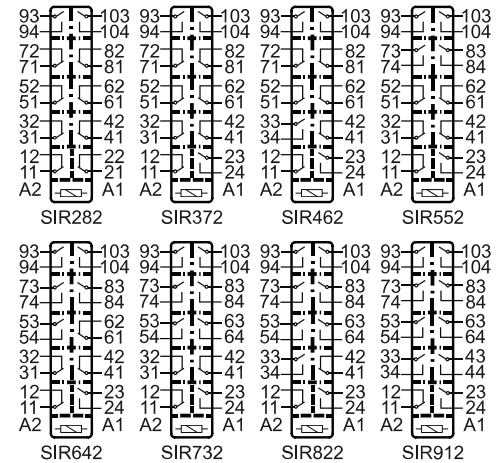
Switching capacity (UL 508)

Continuous current per contact at load of:	C600, R300
1 or 2 contacts	10 A MAX
3 contacts	8,4 A MAX
4 contacts	7,3 A MAX
5 contacts	6,5 A MAX
6 contacts	6 A MAX
7 contacts	5,5 A MAX
8 contacts	5 A MAX
9 contacts	4,2 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	
- Air and creepage distance (min.)	4 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	
- Air and creepage distance (min.)	8 mm
- Test voltage	4000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Creepage resistance	CTI 250
Pollution degree	2
Overvoltage category	III
Insulation resistance (min.)	100 MΩ
- Test voltage	500 VDC

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	18 ms
Drop-out time (NC closed) (typ.)*	5 ms
Bounce time (typ.)	NO: 8 ms / NC: 12 ms
Shock resistance (16 ms) (min.)	NO: 10g / NC: 6g
Vibration resistance (10-200 Hz) (min.)	NO: 8g / NC: 2,5g
Weight	approx. 60 g
Mounting position	any
Mounting distance (min.)	5 mm

* without coil wiring

Other data

Ambient temperature	-40 °C, ..., +70 °C
Thermal resistance	40 K / W
Protection class	RT II
Solder bath temperature	270 °C / 5 s
Test method (heating)	A (group assembly)
Approvals	cULus, TÜV
Flammability class	UL 94 V-0
UL File	E188953 Sec. 3

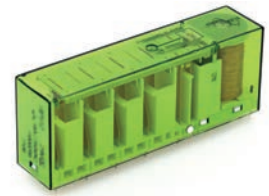
Options, Accessories

Other coil designs	possible
Coils accord. to EN 50155 (railway applications)	possible

Product key

SIR 3 7 2 24VDC XX

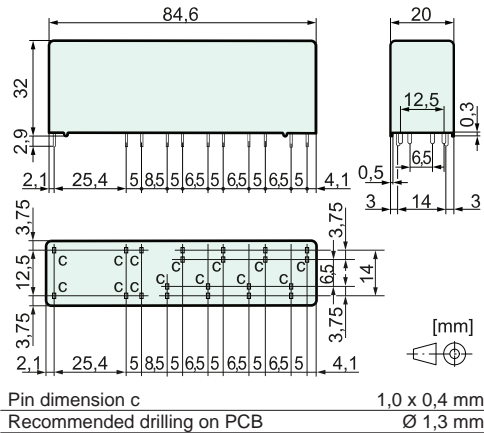
SIR	Type designation	
3	Number of contacts NO	
7	Number of contacts NC	
2	Connection technology	2 = Solder terminals
24VDC	Nominal coil voltage	
XX	Options	



Features

- Relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Suitable for print mounting
- High switching capacity
- Contact assembly
SIP512: 5 NO + 1 NC, SIP422: 4 NO + 2 NC

Dimensions

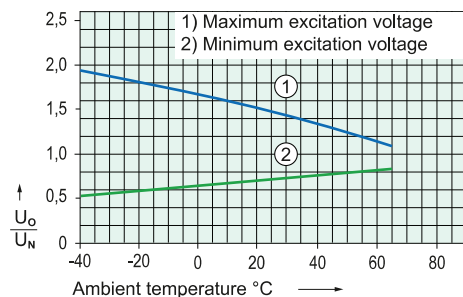


Coil data at 20 °C

Nominal power (typ.)	1,3 W
Holding power (typ.)	0,39 W
Coil limit temperature	125 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)	Resistance (Ohm)
5,0	3,5	0,5	260	19 (1 ± 10 %)
12,0	8,4	1,2	109	110 (1 ± 10 %)
18,0	12,6	1,8	72	248 (1 ± 10 %)
24,0	16,8	2,4	55	440 (1 ± 10 %)
48,0	33,6	4,8	27	1760 (1 ± 10 %)
60,0	42,0	6,0	22	2750 (1 ± 10 %)
110,0	77,0	11,0	12	9250 (1 ± 13 %)
220,0	154,0	22,0	6	37000 (1 ± 15 %)

Excitation voltage range



Test conditions:

- Graph 1: Contact current contacts 11-12, 21-22, 23-24: 4 A MAX, contacts 33-34, 43-44, 53-54, 63-64: 12 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

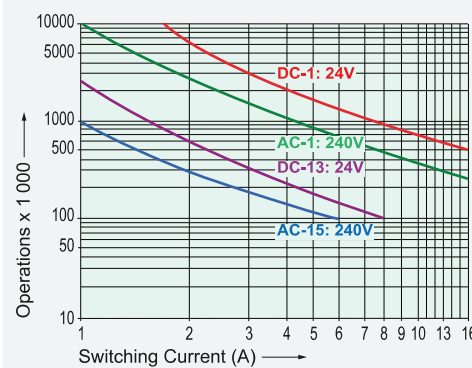
Contact data

Contact resistance as new (max.)	100 mΩ
Contact data apply to contacts 11-12, 21-22, 23-24	
Contact material	AgSnO ₂ + 0,2, ..., 0,4 μm Au
Contact type	crown contact
Rated switching power	1500 VA
250 V / 6 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100000
Inrush current	15 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	5 mA, ..., 6 A
Switching power range*	60 mW, ..., 1500 W (VA)
Short circuit resistance of contacts** with pre-fuse	1000 A SCPD 6 A gG / gL (fuse)
Electrical life, Switching capacity, Continuous current	see SIR8 series

Contact data apply to contacts 33-34, 43-44, 53-54, 63-64	
Contact material	AgSnO ₂
Contact type	single contact
Rated switching power	4000 VA
250 V(400 V / 16 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	250000
Inrush current	60 A for 20 ms
Switching voltage range	5, ..., 250 V DC (480 V AC)
Switching current range*	10 mA, ..., 16 A
Switching power range*	120 mW, ..., 4000 W (VA)
Short circuit resistance of contacts** with pre-fuse	1000 A SCPD 16 A gG / gL (fuse)

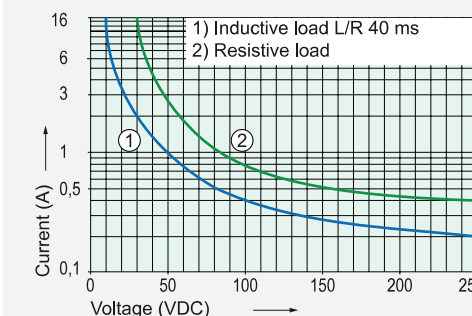
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

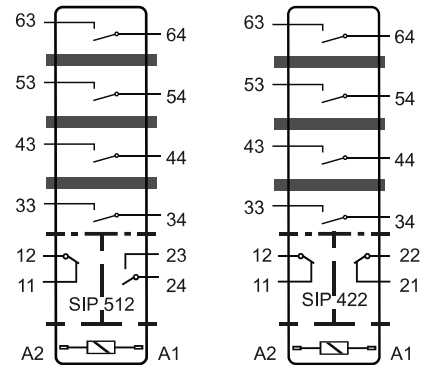


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 16 A MAX
AC-15:	240 V / 6 A MAX
DC-1:	24 V / 16 A MAX
DC-13:	24 V / 8 A / 0,1 Hz MAX
Switching capacity (UL 508)	A600, R150
Continuous current per contact at load of:	
1 or 2 contacts	16 A MAX
3 contacts	12 A MAX
4 contacts	10 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	— — — — —
- Air and creepage distance (min.)	4 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	— — — — —
- Air and creepage distance (min.)	8 mm
- Test voltage	4000 V _{rms} / 1 min
Double or reinforced insulation	— — — — —
- Air and creepage distance (min.)	10 mm
- Test voltage	5000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Creepage resistance	CTI 250
Pollution degree	2
Overvoltage category	III
Insulation resistance (min.)	100 MΩ
- Test voltage	500 VDC

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	18 ms
Drop-out time (NC closed) (typ.)*	5 ms
Bounce time (typ.)	NO: 8 ms / NC: 12 ms
Shock resistance (16 ms) (min.)	NO: 10g / NC: 8g
Vibr. resistance (10-200 Hz) (min.)	NO: 10g / NC: 3,5g
Weight	approx. 60 g
Mounting position	any
Mounting distance (min.)	5 mm

* without coil wiring

Technical data

Ambient temperature	-40 °C, ..., +70 °C
Thermal resistance	40 K / W
Protection class	RT II
Solder bath temperature	270 °C / 5 s
Test method (heating)	A (group assembly)
Approvals	cULus, TÜV
Flammability class	UL 94 V-0
UL File	E188953 Sec. 4

Options, Accessories

Other coil designs	possible
Coils accord. to EN 50155 (railway applications)	possible

Product key

SIP	4	2	2	24VDC	XX
SIP	Type designation				
4	Number of contacts NO				
2	Number of contacts NC				
2	Connection technology				
24VDC	Nominal coil voltage				
XX	Options				

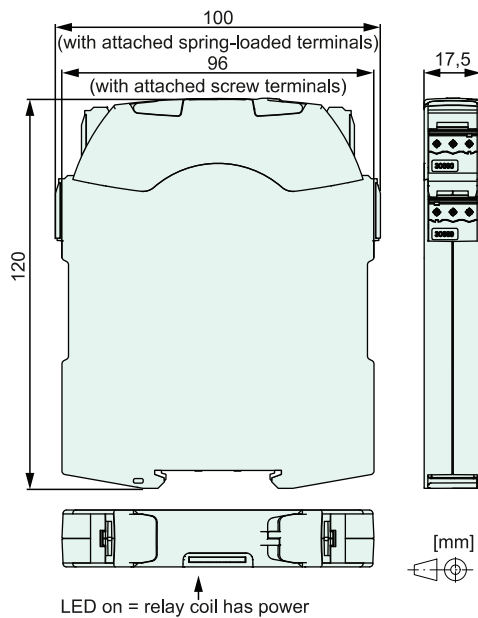


Features

- Relay module with 4-pole relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Integration in safety applications according to IEC/EN 62061, ISO/EN 13849 possible*
- Mounting on 35 mm mounting rail (IEC 60715)
- Switching current: 8 A MAX
- Switching voltage: 250 V AC/DC
- Power consumption: 0,83 ... 1,4 W
- Overvoltage protection in the control unit
- With spring terminals (SMD319)
- With screw terminals (SMD318)
- Contact assembly SMD318/319: 3 NO + 1 NC

* User is responsible for correct integration!

Dimensions

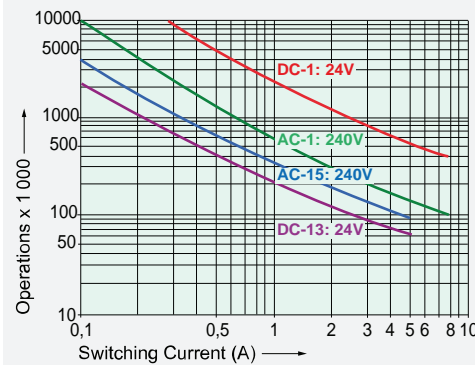


Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 μm Au
Type of contact	Single contact with notched crown
Rated switching power	2000 VA
250 V / 8 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100 000
Inrush current	30 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	3 mA, ..., 8 A
Switching power range*	40 mW, ..., 2000 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of NO contacts**	1 000 A
with pre-fuse	SCPD 10 A gG / gL (fuse)
Short circuit resistance of NC contacts**	1 000 A
with pre-fuse	SCPD 6 A gG / gL (fuse)

* Reference values ** Prospective short-circuit current

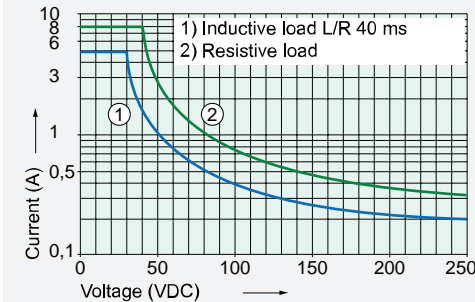
Electrical life (NO contacts)



Switching capacity (IEC 61810-1)	
AC-1:	240 V / 8 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 8 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX
	L/R = 40 ms

Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of:	
1 or 2 contacts	8 A MAX
3 contacts	6 A MAX

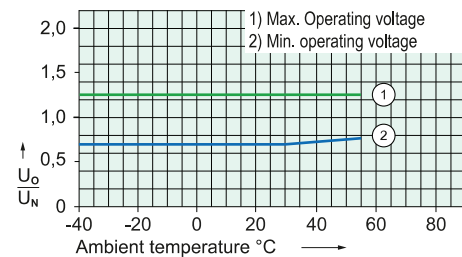
Contact load limit curve (DC)



Module data excitation side at 20 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)
5	3,5	0,5	167
12	8,4	1,2	78
18	12,6	1,8	66
24	16,8	2,4	40
110	77,0	11,0	13

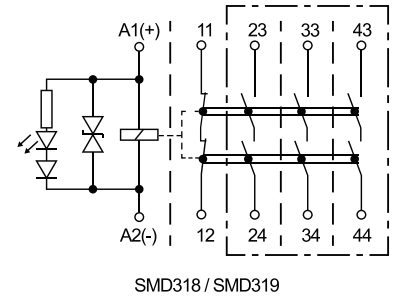
Excitation voltage range



Test conditions:

- Graph 1: Contact current 5 A MAX
- Graph 2: without previous operation
- Duty cycle 100%

Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	
- Air and creepage distance (min.)	2,5 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	
- Air and creepage distance (min.)	5,5 mm
- Test voltage	4000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Pollution degree	2
Overvoltage category	III

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	8 Hz
Response time (NO closed) (typ.)	20 ms
Drop-out time (NC closed) (typ.)*	5 ms
Bounce time (typ.)	NO: 2 ms / NC: 20 ms
Shock resistance (16 ms) (min.)	NO: 15g / NC: 5g
Vibr. resistance (10-200 Hz) (min.)	NO: 10g / NC: 1,5g
Weight	approx. 130 g
Mounting position	any

* without coil wiring

Technical data

Connection data Screw terminal:	
- Cross sections for wire:	0,2 - 2,5 mm ² / AWG 24 - 14
- Cross sections for braid:	0,2 - 2,5 mm ² / AWG 24 - 12
- Tightening torque:	0,6 Nm
Connection data spring terminal:	
- Cross sections for wire:	0,2 - 2,0 mm ² / AWG 24 - 14
- Cross sections for braid:	0,2 - 2,5 mm ² / AWG 24 - 12

Other data

Ambient temperature	-40 °C, ..., +55 °C
Thermal resistance	60 K / W
Protection class	IP20
Approvals	cULus
UL File	E188953

Mounting instructions

Mounting on 35 mm mounting rail (IEC 60715)

Options, Accessories

Other coil designs possible

Product key

SMD 3 1 8 24VDC XX

SMD	Type designation	
3	Number of contacts NO	
1	Number of contacts NC	
8	Connection technology	8=screw terminal, 9=spring terminal
24VDC	Nominal coil voltage	
XX	Options	

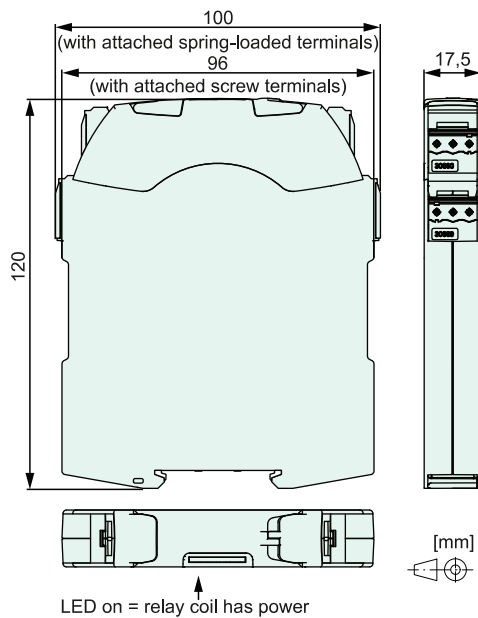


Features

- Relay module with 3-pole relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Integration in safety applications according to IEC/EN 62061, ISO/EN 13849 possible*
- Mounting on 35 mm mounting rail (IEC 60715)
- Switching current max. 10 A
- Switching voltage: 250 V AC/DC
- Power consumption: 0,7 ... 1,15 W
- Overvoltage protection in the control unit
- With spring terminals (SMF219)
- With screw terminals (SMF218)
- Contact assembly
SMF218/219: 2 NO + 1 NC

* User is responsible for correct integration!

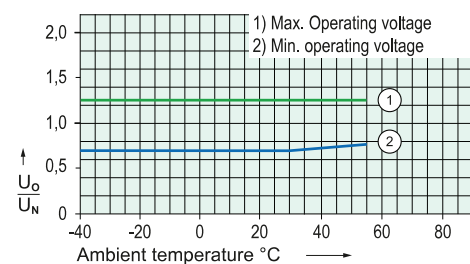
Dimensions



Module data excitation side at 20 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)
12	8,4	1,2	60
24	16,8	2,4	47
48	33,6	4,8	20
110	77,0	11,0	10

Excitation voltage range



Test conditions:

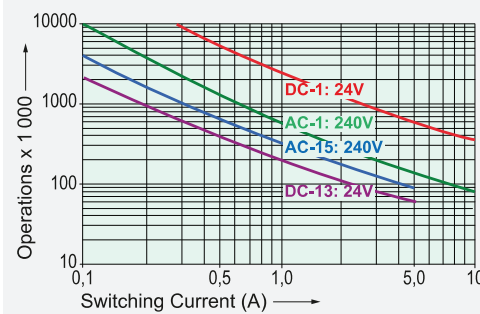
- Graph 1: Contact current 6 A MAX
- Graph 2: without previous operation
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power	2500 VA
250 V / 10 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100 000
Inrush current	30 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	3 mA, ..., 10 A
Switching power range*	40 mW, ..., 2500 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of NO contacts**	1 000 A
with pre-fuse	SCPD 10 A gG / gL (fuse)
Short circuit resistance of NC contacts**	1 000 A
with pre-fuse	SCPD 6 A gG / gL (fuse)

* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)



Switching capacity (IEC 61810-1)

AC-1:	240 V / 10 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 10 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX

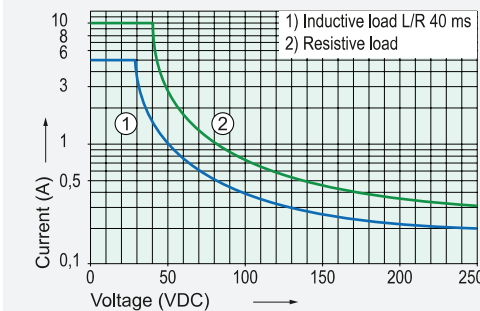
Switching capacity (UL 508)

B300, R300

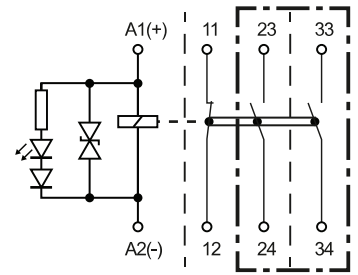
Continuous current per contact at load of:

1 contact	10 A MAX
2 contacts	8 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



SMF218 / SMF219

Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	
- Air and creepage distance (min.)	2,5 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	
- Air and creepage distance (min.)	5,5 mm
- Test voltage	4000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Pollution degree	2
Overvoltage category	III

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	12 ms
Drop-out time (NC closed) (typ.)*	5 ms
Bounce time (typ.)	NO: 1,5 ms / NC: 15 ms
Shock resistance (16 ms) (min.)	NO: 14g / NC: 4g
Vibration resistance (10-200 Hz) (min.)	NO: 6g / NC: 4g
Weight	approx. 110 g
Mounting position	any

* without coil wiring

Technical data

Connection data Screw terminal:

- Cross sections for wire: 0,2 - 2,5 mm² / AWG 24 - 14
- Cross sections for braid: 0,2 - 2,5 mm² / AWG 24 - 12
- Tightening torque: 0,6 Nm

Connection data spring terminal:

- Cross sections for wire: 0,2 - 2,0 mm² / AWG 24 - 14
- Cross sections for braid: 0,2 - 2,5 mm² / AWG 24 - 12

Other data

Ambient temperature	-40 °C, ..., +55 °C
Thermal resistance	60 K / W
Protection class	IP20
Approvals	cULus
UL File	E188953

Mounting instructions

Mounting on 35 mm mounting rail (IEC 60715)

Options, Accessories

Other coil designs possible

Product key

SMF 2 1 8 24VDC XX

SMF	Type designation	
2	Number of contacts NO	
1	Number of contacts NC	
8	Connection technology	8=screw terminal, 9=spring terminal
24VDC	Nominal coil voltage	
XX	Options	

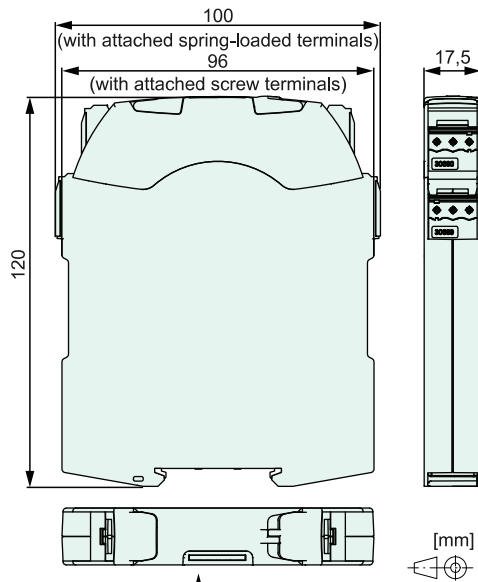


Features

- Relay module with 4-pole relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Integration in safety applications according to IEC/EN 62061, ISO/EN 13849 possible*
- Mounting on 35 mm mounting rail (IEC 60715)
- Switching current max. 8 A
- Switching voltage: 250 V AC/DC
- Power consumption: 0,8 ... 1,25 W
- Overvoltage protection in the control unit
- With spring terminals (SMF229/319)
- With screw terminals (SMF228/318)
- Contact assembly
SMF228/229: 2 NO + 2 NC, SMF318/319: 3 NO + 1 NC

* User is responsible for correct integration!

Dimensions

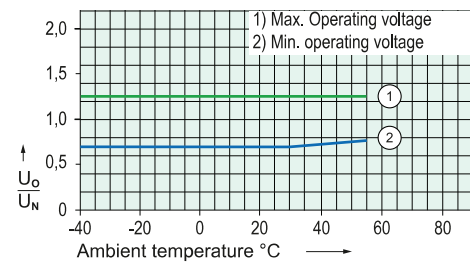


LED on = relay coil has power

Module data excitation side at 20 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)
12	8,4	1,2	69
24	16,8	2,4	51
48	33,6	4,8	33
110	77,0	11,0	11

Excitation voltage range



Test conditions:

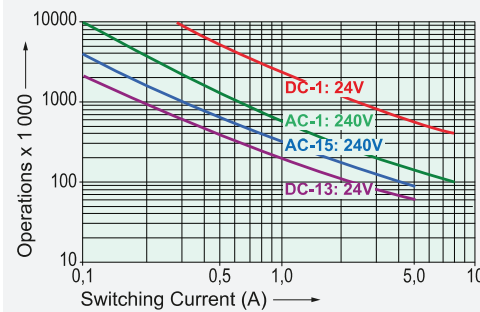
- Graph 1: Contact current 6 A MAX
- Graph 2: without previous operation
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power	2000 VA
250 V / 8 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100 000
Inrush current	30 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	3 mA, ..., 8 A
Switching power range*	40 mW, ..., 2000 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of NO contacts**	1 000 A with pre-fuse SCPD 10 A gG / gL (fuse)
Short circuit resistance of NC contacts**	1 000 A with pre-fuse SCPD 6 A gG / gL (fuse)

* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)



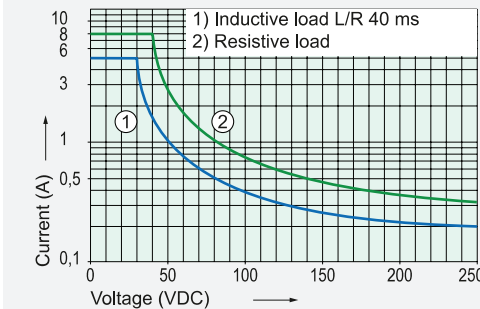
Switching capacity (IEC 61810-1)

AC-1:	240 V / 8 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 8 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX

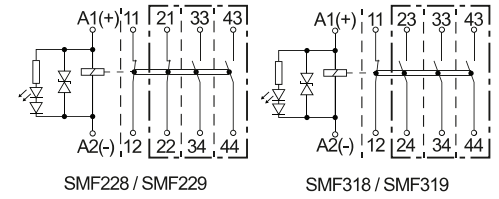
Switching capacity (UL 508)

B300, R300	
Continuous current per contact at load of:	
1 or 2 contacts	8 A MAX
3 contacts	6 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	---
- Air and creepage distance (min.)	2,5 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	---
- Air and creepage distance (min.)	5,5 mm
- Test voltage	4000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Pollution degree	2
Overvoltage category	III

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	12 ms
Drop-out time (NC closed) (typ.)*	5 ms
Bounce time (typ.)	NO: 1,5 ms / NC: 15 ms
Shock resistance (16 ms) (min.)	NO: 14g / NC: 4g
Vibration resistance (10-200 Hz) (min.)	NO: 6g / NC: 4g
Weight	approx. 110 g
Mounting position	any

* without coil wiring

Technical data

Connection data Screw terminal:

- Cross sections for wire: 0,2 - 2,5 mm² / AWG 24 - 14
- Cross sections for braid: 0,2 - 2,5 mm² / AWG 24 - 12
- Tightening torque: 0,6 Nm

Connection data spring terminal:

- Cross sections for wire: 0,2 - 2,0 mm² / AWG 24 - 14
- Cross sections for braid: 0,2 - 2,5 mm² / AWG 24 - 12

Other data

Ambient temperature	-40 °C, ..., +55 °C
Thermal resistance	60 K / W
Protection class	IP20
Approvals	cULus
UL File	E188953

Mounting instructions

Mounting on 35 mm mounting rail (IEC 60715)

Options, Accessories

Other coil designs possible

Product key

SMF 3 1 8 24VDC XX

SMF	Type designation	
3	Number of contacts NO	
1	Number of contacts NC	
8	Connection technology	8=screw terminal, 9=spring terminal
24VDC	Nominal coil voltage	
XX	Options	

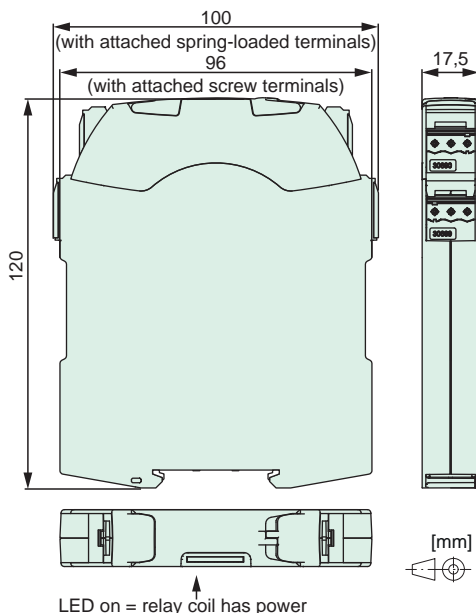


Features

- Relay module with 6-pole relay with forcibly guided contacts according to IEC 61810-3
- Application type A
- Protective separation (see insulation data)
- Integration in safety applications according to IEC/EN 62061, ISO/EN 13849 possible*
- Mounting on 35 mm mounting rail (IEC 60715)
- Switching current max. 8 A
- Switching voltage: 250 V AC/DC
- Power consumption: 0,67 ... 1,2 W
- Overvoltage protection in the control unit
- With spring terminals (SMF329/419)
- With screw terminals (SMF328/418)
- Contact assembly
SMF328/329: 3 NO + 2 NC, SMF418/419: 4 NO + 1 NC

* User is responsible for correct integration!

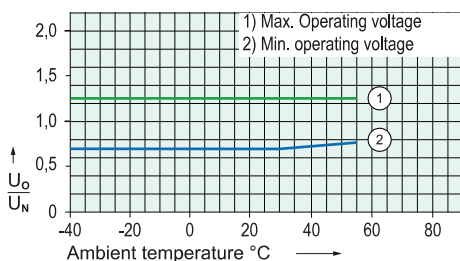
Dimensions



Module data excitation side at 20 °C

Nominal voltage (VDC)	Min. Pick-up voltage (VDC)	Min. Drop-out voltage (VDC)	Nominal current (mA)
12	8,4	1,2	65
24	16,8	2,4	48
48	33,6	4,8	20
110	77,0	11,0	11

Excitation voltage range



Test conditions:

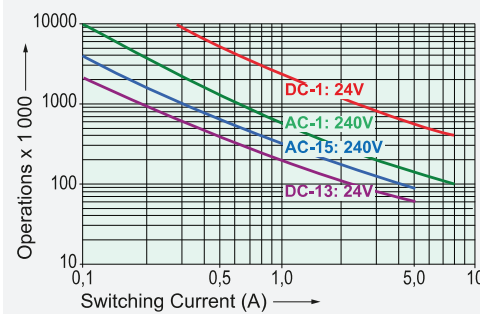
- Graph 1: Contact current 5 A MAX
- Graph 2: without previous operation
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power	2000 VA
250 V / 8 A / AC-1 (max.)	
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100 000
Inrush current	30 A for 20 ms
Switching voltage range	5, ..., 250 V DC / AC
Switching current range*	3 mA, ..., 8 A
Switching power range*	40 mW, ..., 2000 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of NO contacts**	1 000 A
with pre-fuse	SCPD 10 A gG / gL (fuse)
Short circuit resistance of NC contacts**	1 000 A
with pre-fuse	SCPD 6 A gG / gL (fuse)

* Reference values ** Prospective short-circuit current

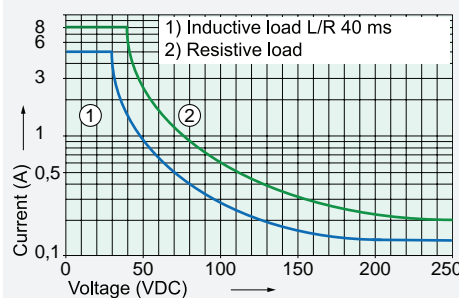
Electrical life (NO contacts)



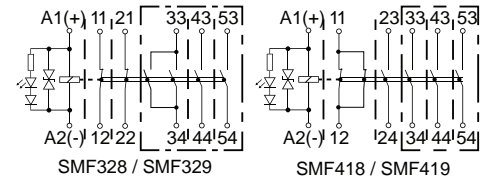
Switching capacity (IEC 61810-1)	
AC-1:	240 V / 8 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 8 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX

Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of:	
1 or 2 contacts	8 A MAX
3 contacts	6 A MAX
4 contacts	4,5 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	— — — — —
- Air and creepage distance (min.)	2,5 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	— — — — —
- Air and creepage distance (min.)	5,5 mm
- Test voltage	4000 V _{rms} / 1 min
Open contact: Test voltage*	1500 V _{rms} / 1 min
Pollution degree	2
Overvoltage category	III

* Initial value

Mechanical data

Mechanical lifetime (min.)	10 x 10 ⁶ operations
Switching frequency (max.)	15 Hz
Response time (NO closed) (typ.)	20 ms
Drop-out time (NC closed) (typ.)*	8 ms
Bounce time (typ.)	NO: 1,5 ms / NC: 15 ms
Shock resistance (16 ms) (min.)	NO: 10g / NC: 5g
Vibration resistance (10-200 Hz) (min.)	NO: 10g / NC: 2g
Weight	approx. 130 g
Mounting position	any

* without coil wiring

Technical data

Connection data Screw terminal:	
- Cross sections for wire:	0,2 - 2,5 mm ² / AWG 24 - 14
- Cross sections for braid:	0,2 - 2,5 mm ² / AWG 24 - 12
- Tightening torque:	0,6 Nm
Connection data spring terminal:	
- Cross sections for wire:	0,2 - 2,0 mm ² / AWG 24 - 14
- Cross sections for braid:	0,2 - 2,5 mm ² / AWG 24 - 12

Other data

Ambient temperature	-40 °C, ..., +55 °C
Thermal resistance	47 K / W
Protection class	IP20
Approvals	cULus
UL File	E188953

Mounting instructions

Mounting on 35 mm mounting rail (IEC 60715)

Options, Accessories

Other coil designs possible

Product key

SMF 4 1 8 24VDC XX

SMF	Type designation	
4	Number of contacts NO	
1	Number of contacts NC	
8	Connection technology	8=screw terminal, 9=spring terminal
24VDC	Nominal coil voltage	
XX	Options	

Mounting rail socket

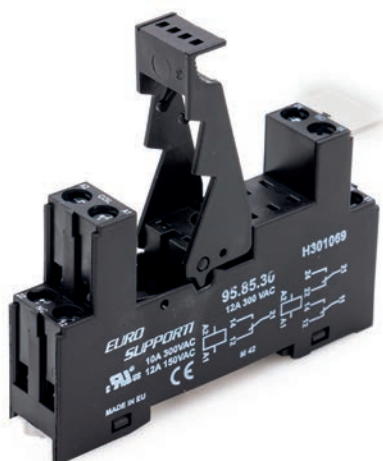
SRD SGR2

for SGR282 ZK

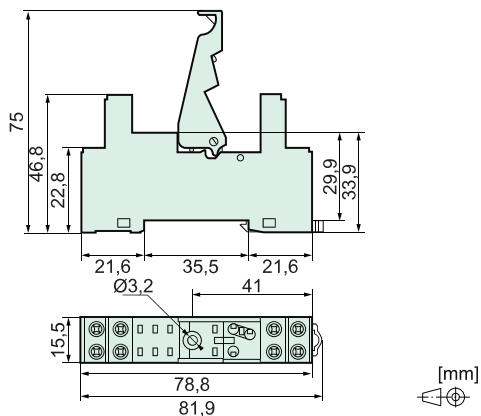


Features

- Plug-in socket with screw terminals
- For relay series SGR282 ZK (VAR1, VAR2)
- With plastic retaining bracket
- Identification plate (1 piece)
- Mounting
 - on mounting rail 35 mm (IEC 60715)
 - central mounting with M3 screw



Dimensions

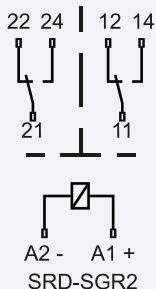


Technical data

Limit continuous current*	8 A
Rated voltage	300 VAC
Connections:	
- Cross sections for wire	2 x 2,5 mm ²
- Cross sections for stranded wire	2 x 1,5 mm ²
- Torque	max. 0,8 Nm

*max. note max. contact load in the relay data sheet

Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	— — — — —
- Air and creepage distance (min.)	4 mm
- Test voltage	2500 V _{rms} / 1 min
Creepage resistance	CTI 250
Pollution degree	2
Overvoltage category	III

Mechanical data

Weight	approx. 40 g
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Other data

Ambient temperature	-25 °C ... +70 °C
Approvals	UL, cUL
UL File	E140923

Mounting instructions

Mounting	on 35 mm mounting rail (IEC 60715)
Mounting	with central fastening Screw M3
- Torque	max. 1,28 Nm

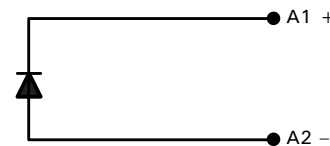
Product key

SRD	SGR2	Socket type	Mounting rail socket
SGR2	Relay series	SGR282 ZK	

Options, Accessories

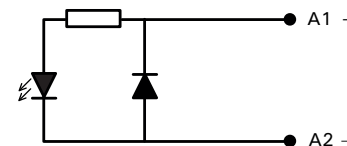
SRD SGR2 M01

- Integrated freewheeling diode
- Suitable for 6 VDC to 230 VDC (+ at terminal A1)



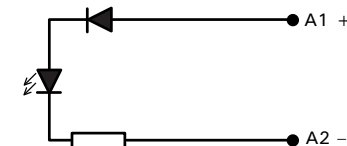
SRD SGR2 M03

- Integrated freewheeling diode
- green LED
- Suitable for 6 VDC to 24 VDC(+ at terminal A1)



SRD SGR2 M05

- green LED
- Integrated reverse polarity protection
- Suitable for 6 VDC to 24 VDC (+ at terminal A1)



Mounting rail socket

SRD SGR2A KV2

for SGR282 ZK

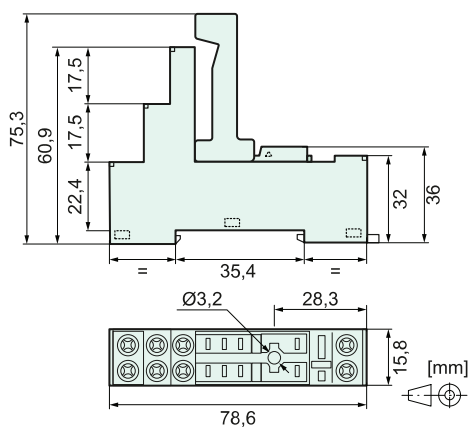


Features

- Plug-in socket with screw terminals
- For relay series SGR282 ZK (VAR1, VAR2)
- Protective separation between coil and contacts
- With plastic retaining bracket
- Identification plate (1 piece)
- Mounting
 - on mounting rail 35 mm (IEC 60715)
 - central mounting with M3 screw



Dimensions

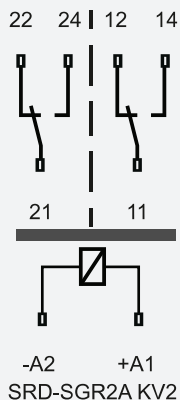


Technical data

Limit continuous current*	8 A
Rated voltage	250 VAC
Connections:	
- Cross sections for wire	1 x 6 mm ² or 2 x 2,5 mm ²
- Cross sections for strand. wire	1 x 6 mm ² or 2 x 2,5 mm ²
- Torque	max. 0,5 Nm

*max. note max. contact load in the relay data sheet

Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	— — —
- Air and creepage distance (min.)	4 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	— — —
- Air and creepage distance (min.)	14 mm
- Test voltage	4000 V _{rms} / 1 min
Creepage resistance	CTI 250
Pollution degree	2
Overvoltage category	III

Mechanical data

Weight	approx. 46 g
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Other data

Ambient temperature	-40 °C ... +70 °C
Approvals	cULus
UL File	E135170

Mounting instructions

Mounting	on 35 mm mounting rail (IEC 60715)
Mounting	with central fastening Screw M3
- Torque	max. 1,28 Nm

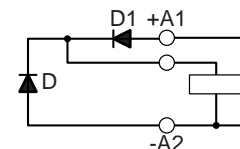
Product key

SRD	Socket type	Mounting rail socket
SGR2	Relay series	SGR282 ZK
A	Socket variant	
KV2	Contact variant	

Options, Accessories

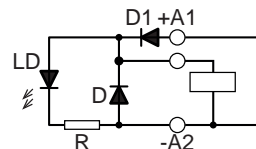
SRD SGR2A M01

- Integrated freewheeling diode
- Integrated reverse polarity protection
- Suitable for 6 VDC to 220 VDC



SRD SGR2A M03

- Integrated freewheeling diode
- Integrated reverse polarity protection
- green LED
- Suitable for 6 VDC to 24 VDC



Mounting rail socket SRD SGR2A KV2 PIK

for SGR282 ZK

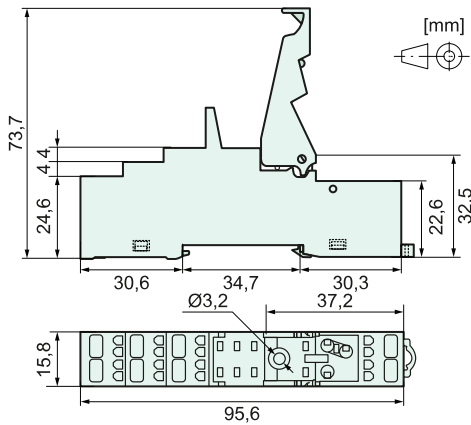


Features

- Plug-in socket with push-in contacts (PIK)
- For relay series SGR282 ZK (VAR1, VAR2)
- Protective separation between coil and contacts
- With plastic retaining bracket
- Identification plate (1 piece)
- Mounting
 - on mounting rail 35 mm (IEC 60715)
 - central mounting with M3 screw



Dimensions

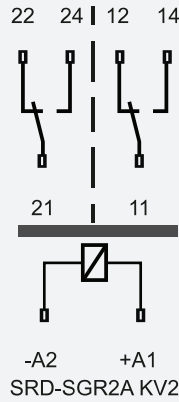


Technical data

Limit continuous current*	8 A
Rated voltage	250 VAC
Connections:	
- Cross sections for wire	1 x 6 mm ² or 2 x 2,5 mm ²
- Cross sections for strand. wire	1 x 6 mm ² or 2 x 2,5 mm ²

*max. note max. contact load in the relay data sheet

Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	— — —
- Air and creepage distance (min.)	4 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	— — —
- Air and creepage distance (min.)	14 mm
- Test voltage	4000 V _{rms} / 1 min
Creepage resistance	CTI 250
Pollution degree	2
Overvoltage category	III

Mechanical data

Weight	approx. 40 g
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Other data

Ambient temperature	-40 °C ... +70 °C
Approvals	cULus
UL File	E135170

Mounting instructions

Mounting	on 35 mm mounting rail (IEC 60715)
Mounting	with central fastening Screw M3
- Torque	max. 1,28 Nm

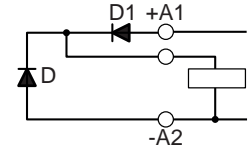
Product key

SRD	SGR2	A	KV2	PIK
SRD	Socket type			Mounting rail socket
SGR2	Relay series			SGR282 ZK
A	Socket variant			
KV2	Contact variant			
PIK	Connection technology			Push-in contacts

Options, Accessories

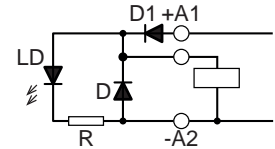
SRD SGR2A M01

- Integrated freewheeling diode
- Integrated reverse polarity protection
- Suitable for 6 VDC to 220 VDC



SRD SGR2A M03

- Integrated freewheeling diode
- Integrated reverse polarity protection
- green LED
- Suitable for 6 VDC to 24 VDC



Mounting rail socket

SRD SIM4

for SIM4

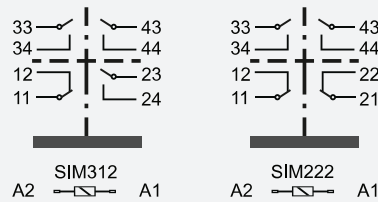


Features

- Plug-in socket with screw terminals
- For relay series SIM4
- Protective separation between coil and contacts
- With plastic retaining bracket
- Mounting
 - on mounting rail 35 mm (IEC 60715)
 - central mounting with 2 x M3 screw



Circuit diagram (top view)



Options, Accessories

none available

Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	— — — —
- Air and creepage distance (min.)	4 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	- - - - -
- Air and creepage distance (min.)	5,5 mm
- Test voltage	3000 V _{rms} / 1 min
Double or reinforced insulation	— — — —
- Air and creepage distance (min.)	14 mm
- Test voltage	4000 V _{rms} / 1 min
Creepage resistance	CTI 250
Pollution degree	2
Overvoltage category	III

Mechanical data

Weight	approx. 65 g
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Other data

Ambient temperature	-25 °C ... +70 °C
Approvals	cULus
UL File	E238167

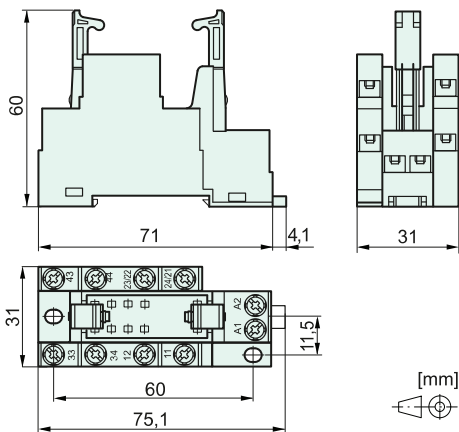
Mounting instructions

Mounting	on 35 mm mounting rail (IEC 60715)
Mounting	with 2 x screw M3
- Torque	max. 1,28 Nm

Product key

SRD	SIM4	
SRD	Socket type	Mounting rail socket
SIM4	Relay series	SIM4

Dimensions



Technical data

Limit continuous current*	8 A
Rated voltage	250 VAC
Connections:	
- Cross sections for wire	2 x 2,5 mm ²
- Cross sections for stranded wire	2 x 1,5 mm ²
- Torque	max. 0,8 Nm

*max. note max. contact load in the relay data sheet

Mounting rail socket

SRD SIS3

for SIS2 and SIS3
with pin length 3,8 mm

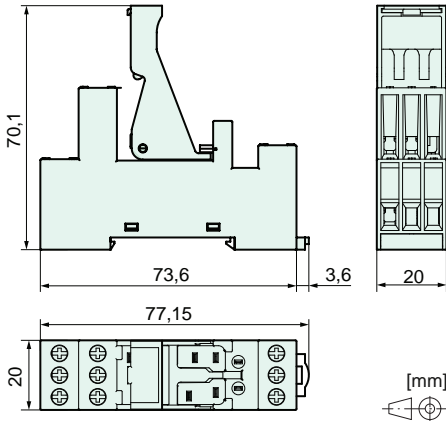


Features

- Plug-in socket with push-in contacts (PIK)
- For relays of the SIS2 and SIS3 series with 3,8 mm pin length
- With plastic retaining bracket
- Mounting
 - on 35 mm mounting rail (IEC 60715)



Dimensions

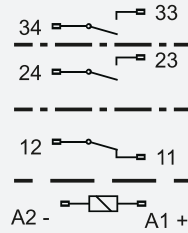


Technical data

Limit continuous current*	6 A
Rated voltage	250 VAC
Connections:	
- Cross sections for wire	2 x 2,5 mm ²
- Cross sections for stranded wire	2 x 1,5 mm ²
- Torque	max. 0,8 Nm

*max. note max. contact load in the relay data sheet

Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	— — — —
- Air and creepage distance (min.)	4 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	— — — —
- Air and creepage distance (min.)	8 mm
- Test voltage	4000 V _{rms} / 1 min
Creepage resistance	CTI 250
Pollution degree	2
Overvoltage category	III

Mechanical Data

Weight	approx. 45 g
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Other data

Ambient temperature	-25 °C ... +70 °C
Approvals	cULus
UL File	E238167

Mounting instructions

Mounting	on 35 mm mounting rail (IEC 60715)
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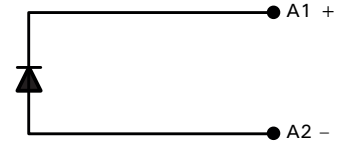
Product key

SRD	SIS3	
SRD	Socket type	Mounting rail socket
SIS3	Relay series	SIS2 and SIS3

Options, Accessories

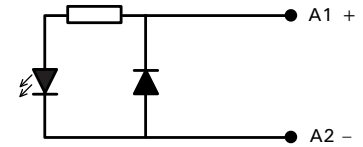
SRD SGR2 M01

- Integrated freewheeling diode
- Suitable for 6 VDC to 230 VDC (+ at terminal A1)



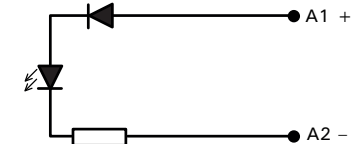
SRD SGR2 M03

- Integrated freewheeling diode
- green LED
- Suitable for 6 VDC to 24 VDC(+ at terminal A1)



SRD SGR2 M05

- green LED
- Integrated reverse polarity protection
- Suitable for 6 VDC to 24 VDC (+ at terminal A1)



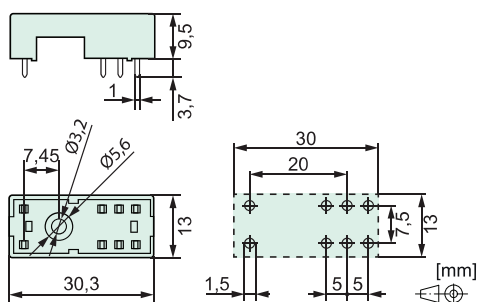


Features

- Plug-in socket with print connections
- For relay series SGR282 ZK (VAR1, VAR2)
- With plastic retaining bracket
- Mounting
 - central mounting with M3 screw



Dimensions

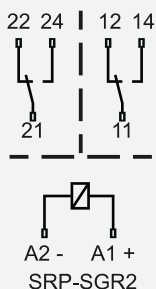


Technical data

Limit continuous current*	8 A
Rated voltage	300 VAC

*max. note max. contact load in the relay data sheet

Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	— — —
- Air and creepage distance (min.)	4 mm
- Test voltage	4 000 V _{rms} / 1 min
Creepage resistance	CTI 250
Pollution degree	2
Overvoltage category	III

Mechanical data

Weight	approx. 4 g
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Other data

Ambient temperature	-40 °C ... +70 °C
Approvals	cULus
UL File	E113714

Mounting instructions

Mounting	on PCB
Mounting	with central fastening Screw M3
- Torque	max. 1,28 Nm

Product key

SRP SGR2		
SRP	Socket type	PCB socket
SGR2	Relay series	SGR282 ZK

Options, Accessories

none available

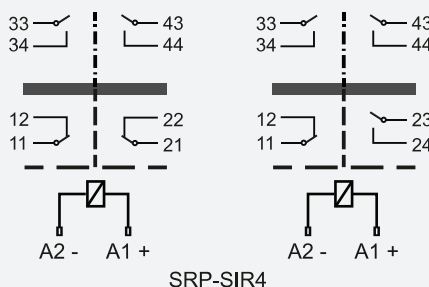


Features

- Plug-in socket with print connections
- For relay series SIR4
- With plastic retaining bracket



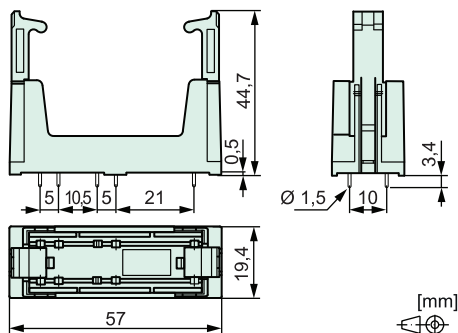
Circuit diagram (top view)



Options, Accessories

none available

Dimensions



Technical data

Limit continuous current*	8 A
Rated voltage	250 VAC

*max. note max. contact load in the relay data sheet

Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	— — — —
- Air and creepage distance (min.)	4 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	- - - - -
- Air and creepage distance (min.)	8 mm
- Test voltage	4000 V _{rms} / 1 min
Double or reinforced insulation	■ ■ ■ ■ ■
- Air and creepage distance (min.)	10 mm
- Test voltage	5000 V _{rms} / 1 min
Creepage resistance	CTI 250
Pollution degree	2
Overvoltage category	III

Mechanical data

Weight	approx. 15 g
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Other data

Ambient temperature	-25 °C ... +70 °C
Approvals	cULus
UL File	E301947

Mounting instructions

Mounting	on PCB
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Product key

SRP	SIR4	
SRP	Socket type	PCB socket
SIR4	Relay series	SIR4

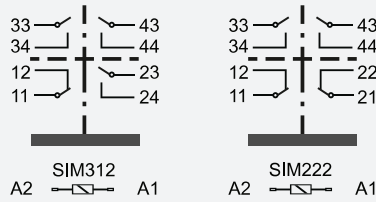


Features

- Plug-in socket with print connections
- For relay series SIM3 and SIM4
- With plastic retaining bracket



Circuit diagram (top view)



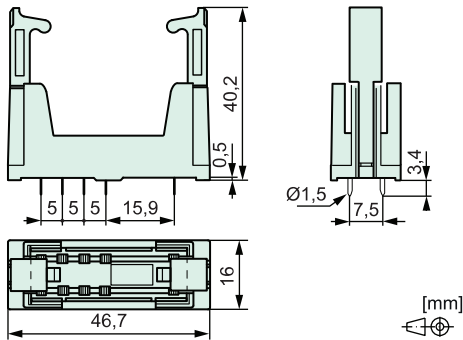
Options, Accessories

none available

Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	— — — —
- Air and creepage distance (min.)	4 mm
- Test voltage	2500 V _{rms} / 1 min
Double or reinforced insulation	- - - - -
- Air and creepage distance (min.)	8 mm
- Test voltage	4000 V _{rms} / 1 min
Double or reinforced insulation	—————
- Air and creepage distance (min.)	10 mm
- Test voltage	5000 V _{rms} / 1 min
Creepage resistance	CTI 250
Pollution degree	2
Overvoltage category	III

Dimensions



Mechanical data

Weight approx. 11 g

Other data

Ambient temperature	-25 °C ... +70 °C
Approvals	cULus
UL File	E301947

Mounting instructions

Mounting on PCB

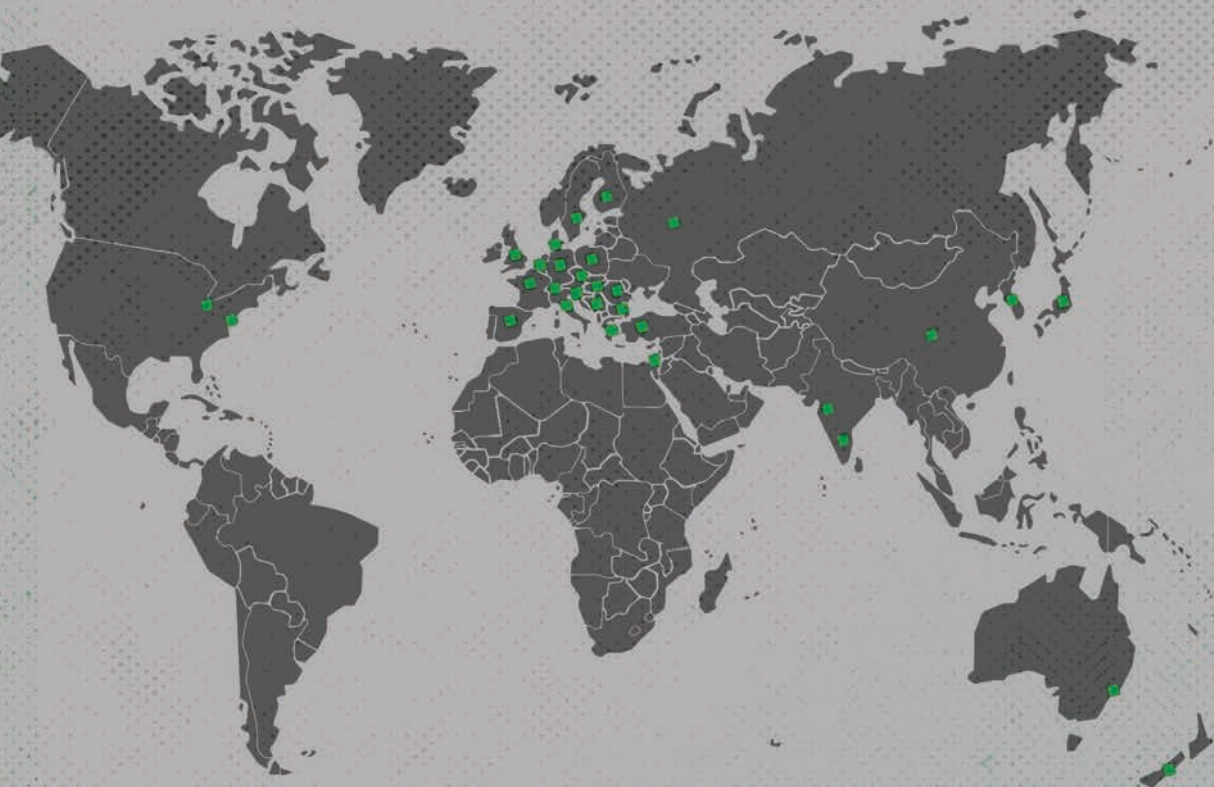
Product key

SRP	SIM4	
SRP	Socket type	PCB socket
SGR2	Relay series	SIR4

Technical data

Limit continuous current*	8 A
Rated voltage	250 VAC

*max. note max. contact load in the relay data sheet



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