ELESTA

RELAYS WITH FORCIBLY GUIDED CONTACTS

EMAIL: ADMIN@ELESTA-GMBH.COM
WORLDWIDE: WWW.ELESTA-GMBH.COM

ADDRESS: HEUTEILSTRASSE 18, CH-7310 BAD RAGAZ
PHONE: +41 81 303 54 00

RELAYS, RELAY ACCESSORIES AND RELAY MODULES

ELESTA
Member of the PILZ Group

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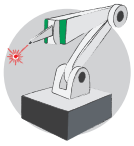
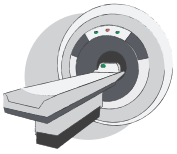
ABOUT US

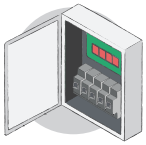




Until the 1980s, ELESTA stood for Swiss innovation in electromechanics and electronics. When the new ELESTA relays GmbH was founded in March 1997 from the inheritance of the "old" ELESTA Elektronik AG, the company concentrated on the production of relays with forcibly guided contacts. Later, the business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

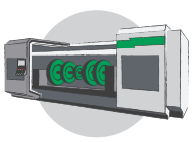
What started in 1997 with about a dozen employees and the production of a few relays became a success story. In the middle of Europe, one of the most innovative relay manufacturers in the world has successfully established itself.

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

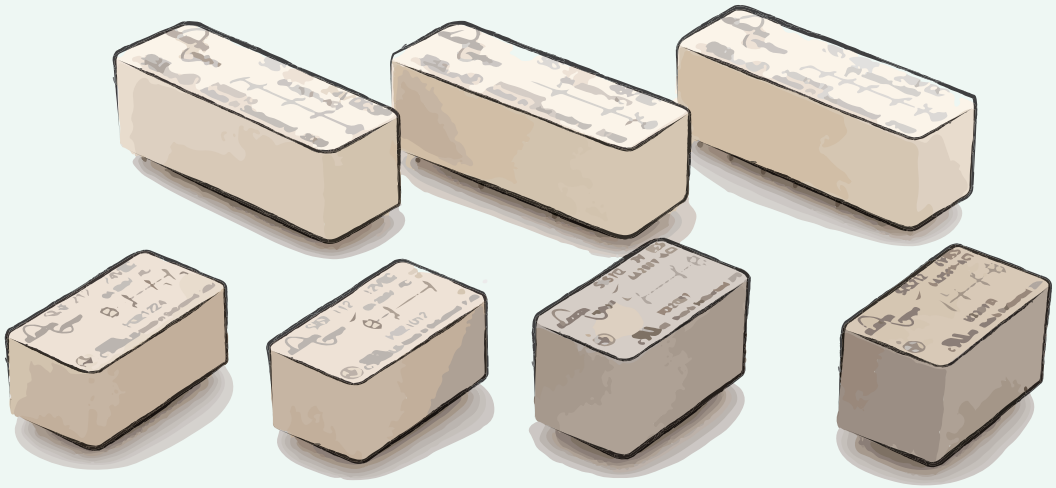
SISF2, SISF3

- 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

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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

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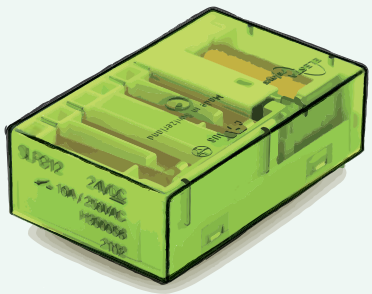

OUR MODEL SERIES

HIGH INSULATION

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

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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

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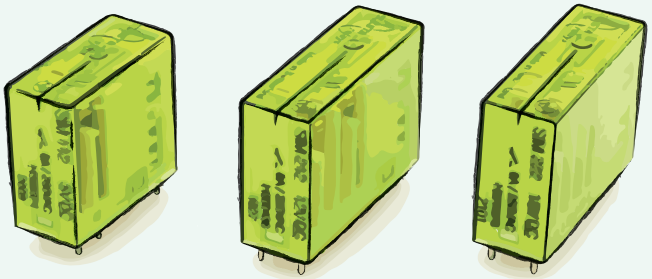

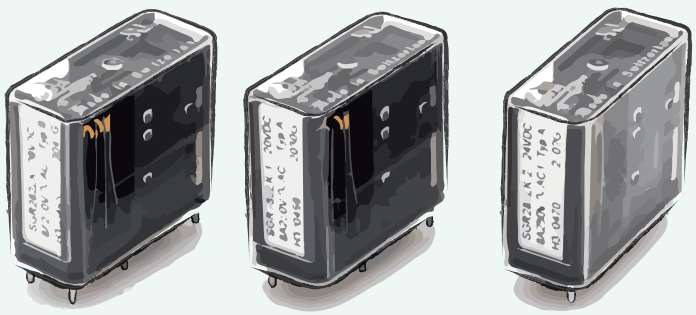

SIR4, SIR6, SIR8, SIR10

- 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

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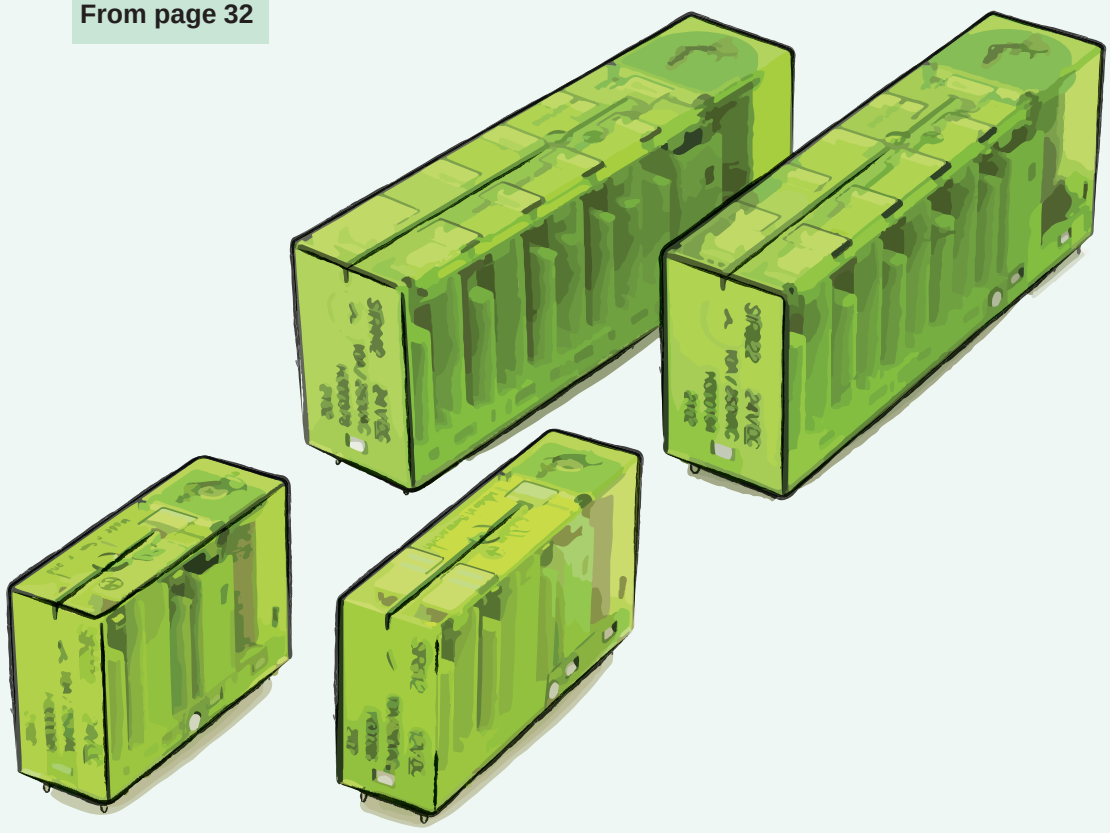

OUR MODEL SERIES

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

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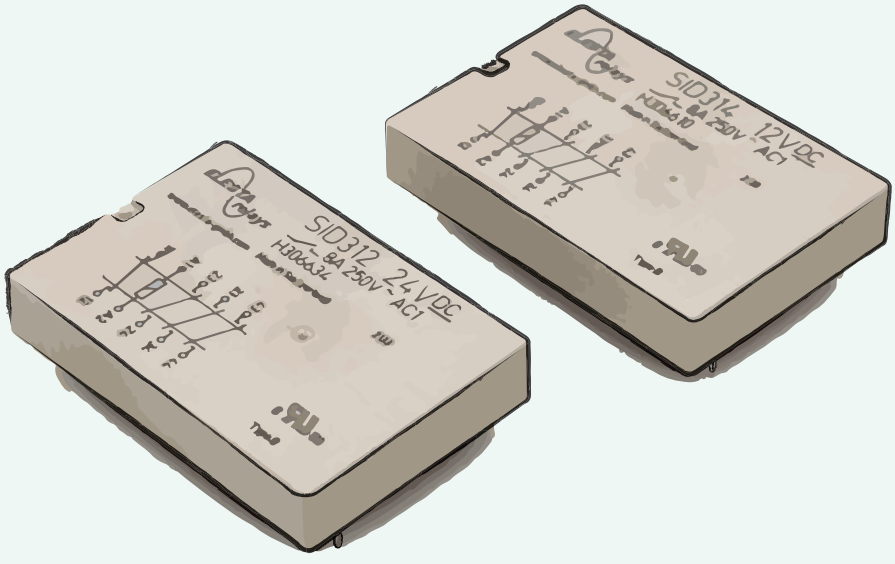

SIR4P

- 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

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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

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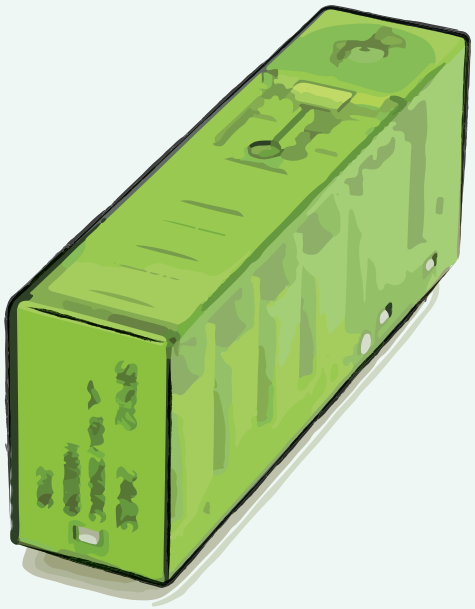

POWERFUL

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

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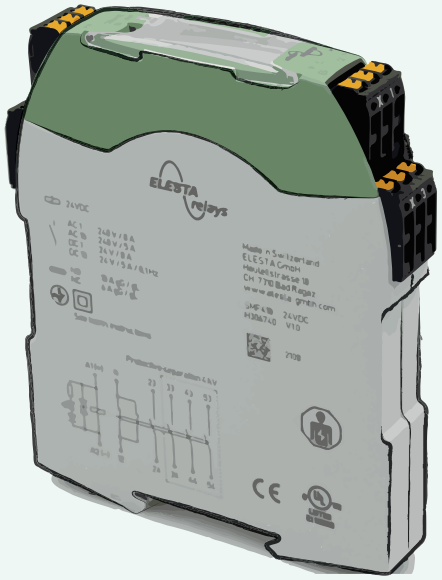

SMF3, SMF4, SMF5

- 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

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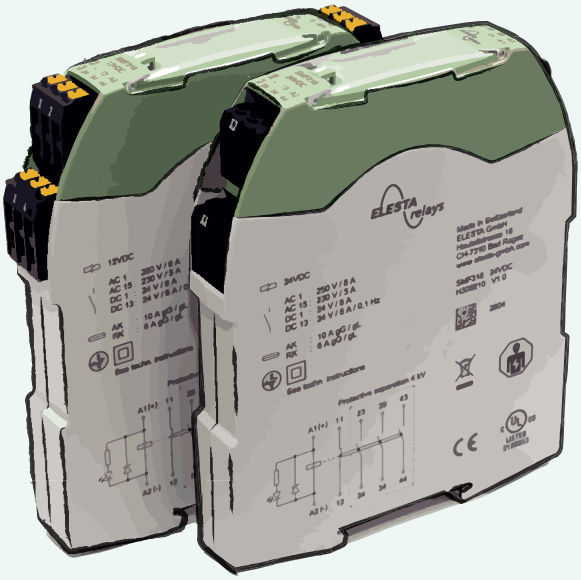
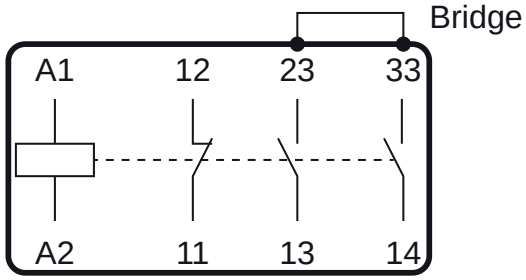


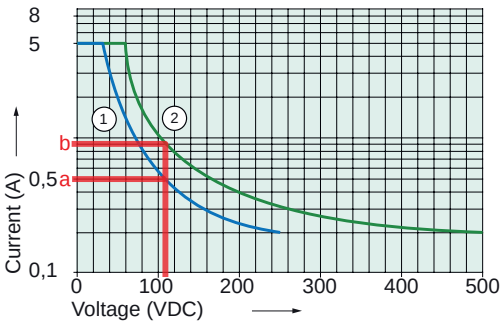
APPLICATION NOTES

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.

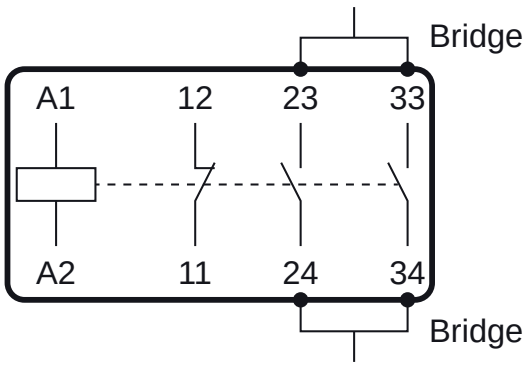


Comparison of load limit curves for contacts
(① one contact, ② two contacts in series)

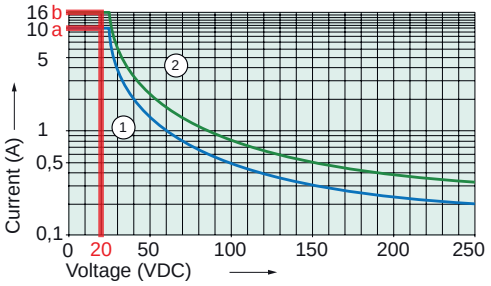


Parallel connection of 2 contacts for load sharing

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.

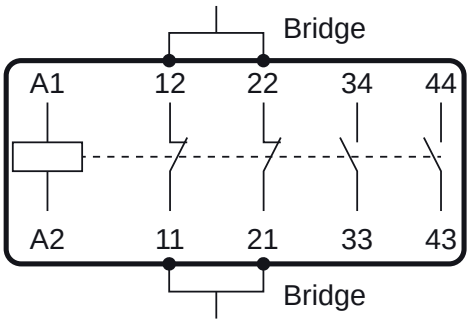


Comparison of load limit curves for contacts
(① one contact, ② two contacts in parllel)



Parallel connection of 2 contacts to increase the contact reliability

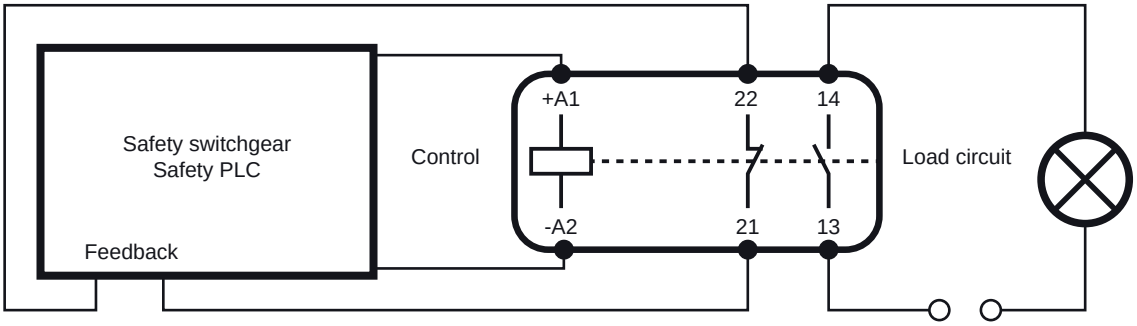
By connecting two relay contacts in parallel, the contact reliability can be increased at very low switching loads or low switching cycles (low demand). Combined with the notched crown contacts, which in themselves achieve an extremely high contact availability, this can be increased even further. Especially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



Notched crown contact

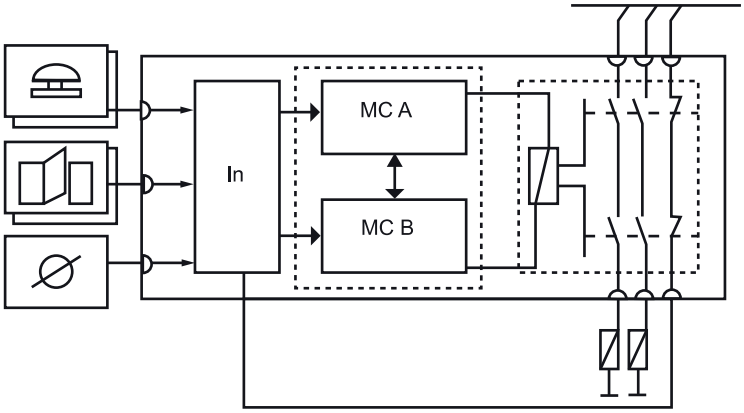
Contact extension with connection to safety PLC or safety switching device

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.

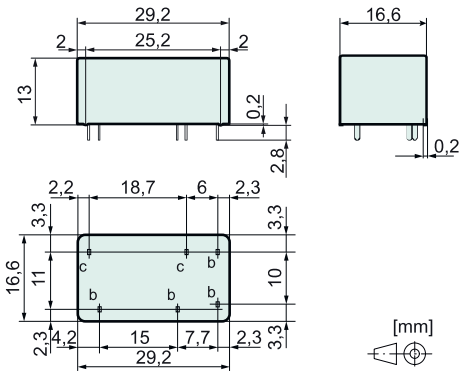


Manipulation security through lacquer and wiring

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.

Relays
SISF2 Series

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

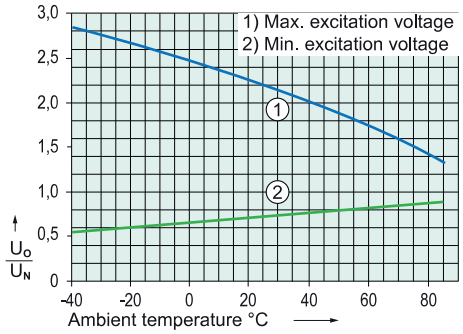
Dimensions


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	1 280 (1 ± 10 %)
48,0	33,6	4,8	9	5 160 (1 ± 13 %)
60,0	42,0	6,0	8	8 000 (1 ± 15 %)



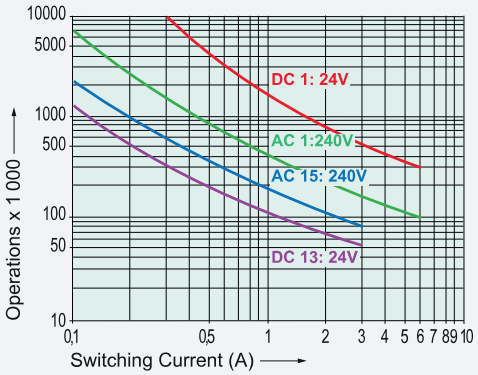
Test conditions:
- Graph 1: Contact current 4 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power 250 V / 6 A / AC-1 (max.)	1 500 VA
Electr. life time (0,1 Hz, rel. duty cycle 10%)	90 000
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, ..., 1 500 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of contacts** with pre-fuse	1 000 A SCPD 6 A gG / gL (fuse)

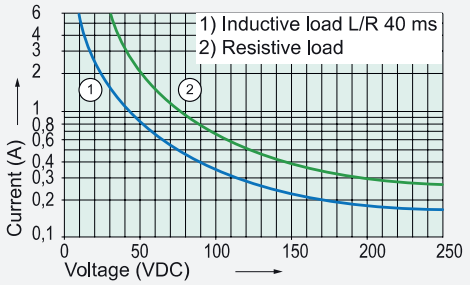
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

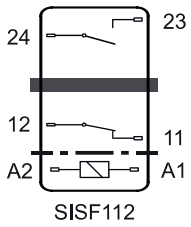


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 6 A MAX
AC-15:	240 V / 3 A MAX
DC-1:	24 V / 6 A MAX
DC-13:	24 V / 3 A / 0,1 Hz MAX L/R = 40 ms
Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of: 1 contact	6 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



SISF112

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.)	8 mm
- Test voltage	4 000 V_{rms} / 1 min
Open contact: Test voltage*	1 500 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	E503 456 Sec.1

Options, Accessories

Other pin lengths	possible
Other coil designs	possible

Product key

SISF | 1 | 1 | 2 | 24VDC | XX

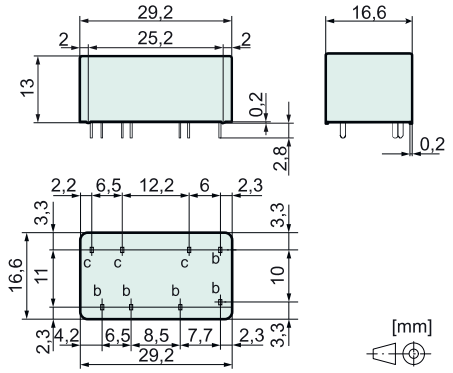
SISF	Type designation	
1	Number of contacts NO	
1	Number of contacts NC	
2	Connection technology	2 = Solder terminals
24VDC	Nominal coil voltage	
XX	Options	

ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

Relays
SISF3 Series

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

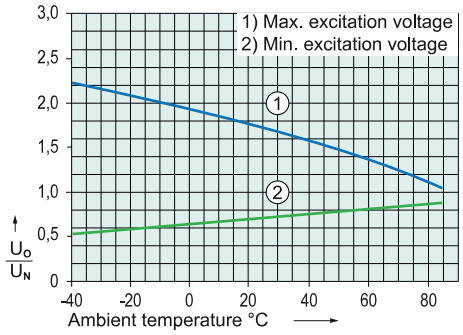


Pin dimension b	1,0 x 0,3 mm
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

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 %)



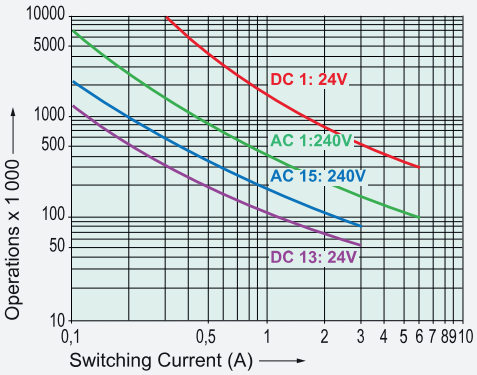
Test conditions:
- Graph 1: Contact current 4 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power 250 V / 6 A / AC-1 (max.)	1500 VA
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** with pre-fuse	1000 A SCPD 6 A gG / gL (fuse)

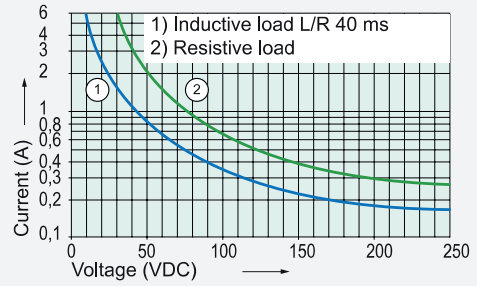
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

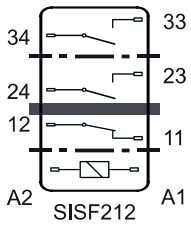


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 6 A MAX
AC-15:	240 V / 3 A MAX
DC-1:	24 V / 6 A MAX
DC-13:	24 V / 3 A / 0,1 Hz MAX L/R = 40 ms
Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of: 1 or 2 contacts	6 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
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	

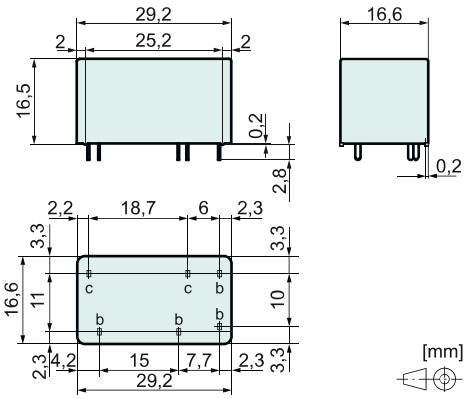
ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

Relays
SIS2 Series

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



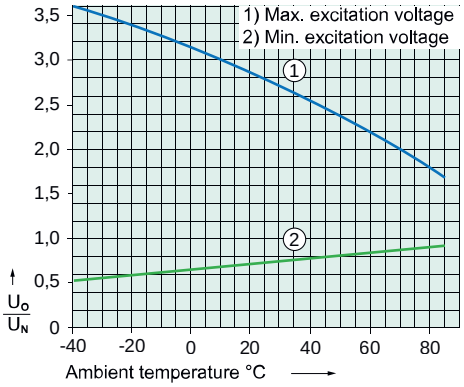
Pin dimension b	1,0 x 0,3 mm
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

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



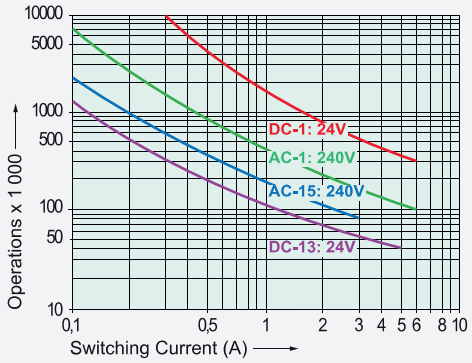
Test conditions:
- Graph 1: Contact current 4 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power 250 V / 6 A / AC-1 (max.)	1500 VA
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** with pre-fuse	1000 A SCPD 6 A gG / gL (fuse)

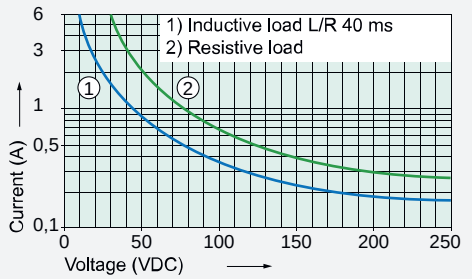
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

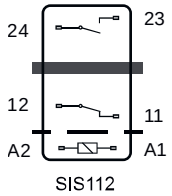


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 6 A MAX
AC-15:	240 V / 3 A MAX
DC-1:	24 V / 6 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX
Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of: 1 contact	6 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



SIS112

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	2 = Solder terminals
24VDC	Nominal coil voltage	
XX	Options	

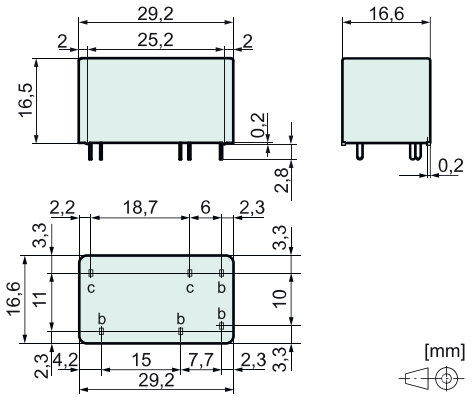
ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

Relays
SIS2 sensitive Series

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



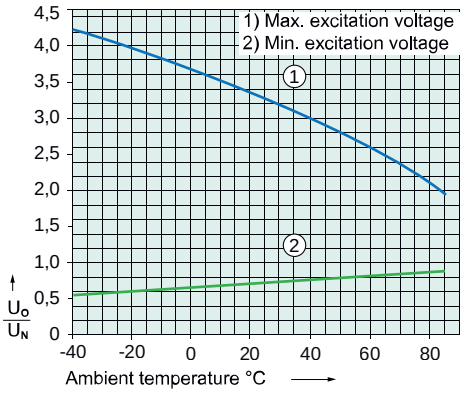
Pin dimension b	1,0 x 0,3 mm
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

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



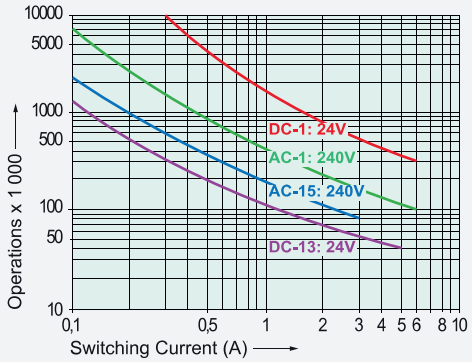
Test conditions:
- Graph 1: Contact current 4 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power 250 V / 6 A / AC-1 (max.)	1500 VA
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** with pre-fuse	1000 A SCPD 6 A gG / gL (fuse)

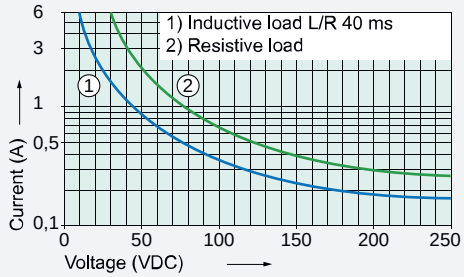
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

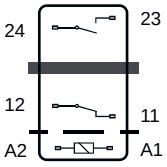


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 6 A MAX
AC-15:	240 V / 3 A MAX
DC-1:	24 V / 6 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX
Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of: 1 contact	6 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



SIS112 SEN

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.)	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	

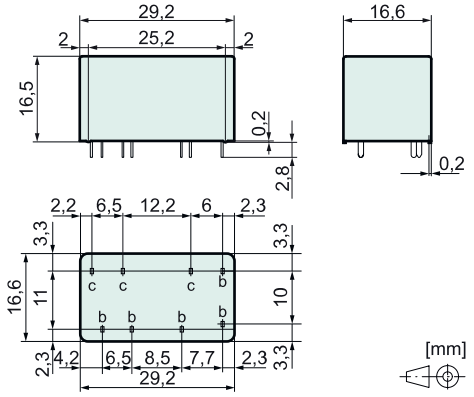
ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

Relays
SIS3 Series

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



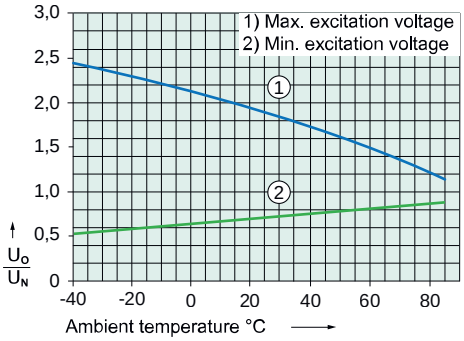
Pin dimension b	1,0 x 0,3 mm
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

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



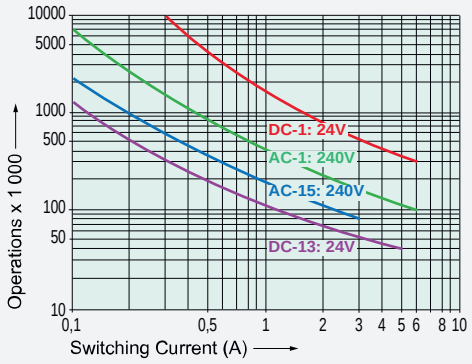
Test conditions:
- Graph 1: Contact current 4 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power 250 V / 6 A / AC-1 (max.)	1500 VA
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)

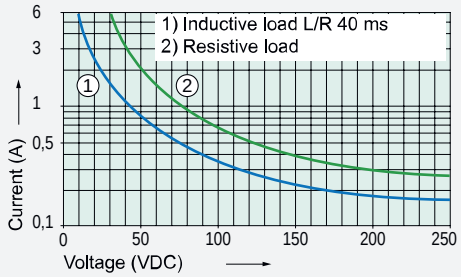
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

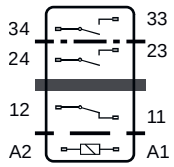


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 6 A MAX
AC-15:	240 V / 3 A MAX
DC-1:	24 V / 6 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX
Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of: 1 or 2 contacts	6 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



SIS212

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
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 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	

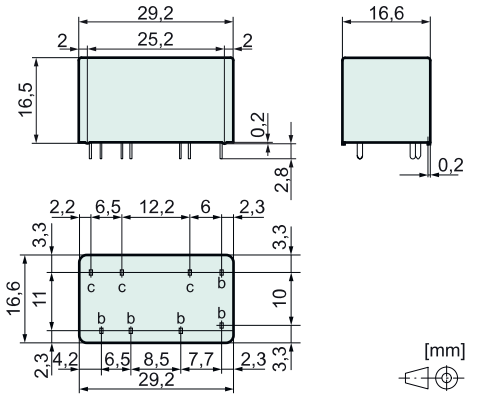
ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

Relays
SIS3 sensitive Series

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



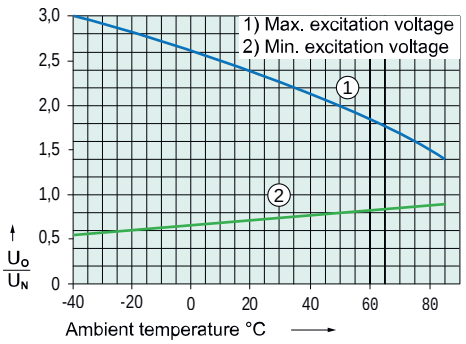
Pin dimension b	1,0 x 0,3 mm
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

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	1 440 (1 ± 10 %)
48,0	36,0	4,8	8	5 750 (1 ± 10 %)
60,0	45,0	6,0	7	9 000 (1 ± 13 %)

Excitation voltage range



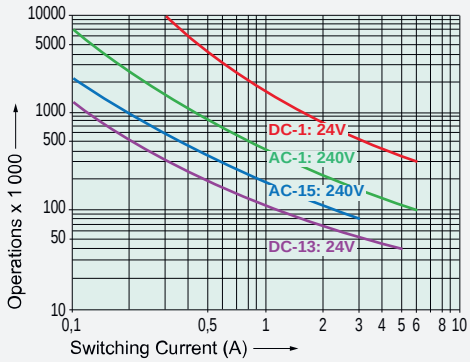
Test conditions:
- Graph 1: Contact current 4 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power 250 V / 6 A / AC-1 (max.)	1 500 VA
Electr. life time (0,1 Hz, rel. duty cycle 10%)	90 000
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, ..., 1 500 W (VA)
Contact resistance as new (max.)	100 mΩ
Short circuit resistance of contacts** with pre-fuse	1 000 A SCPD 6 A gG / gL (fuse)

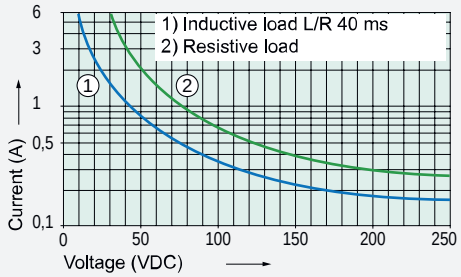
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

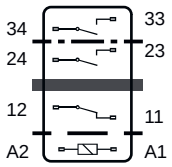


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 6 A MAX
AC-15:	240 V / 3 A MAX
DC-1:	24 V / 6 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX
Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of: 1 or 2 contacts	6 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



SIS212 SEN

Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	
- Air and creepage distance (min.)	4 mm
- Test voltage	2 500 V_{rms} / 1 min
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.)	8 mm
- Test voltage	4 000 V_{rms} / 1 min
Open contact: Test voltage*	1 500 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	E188 953 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 SEN XX

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	

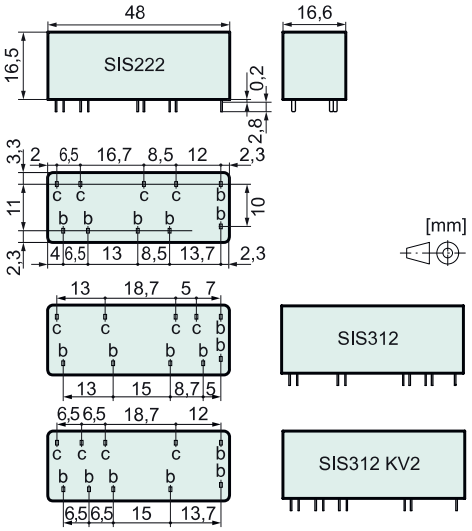
ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

Relays
SIS4 Series

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

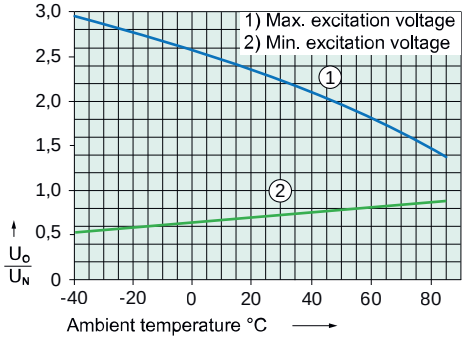


Pin dimension b	1,0 x 0,3 mm
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

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 %)



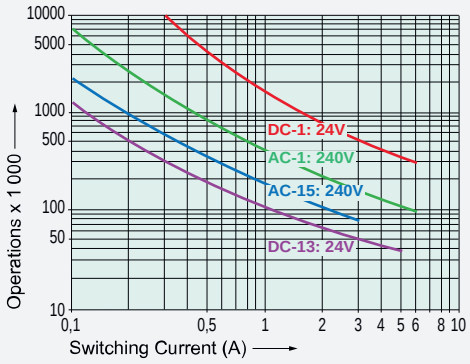
Test conditions:
- Graph 1: Contact current 4 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power 250 V / 6 A / AC-1 (max.)	1500 VA
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** with pre-fuse	1000 A SCPD 6 A gG / gL (fuse)

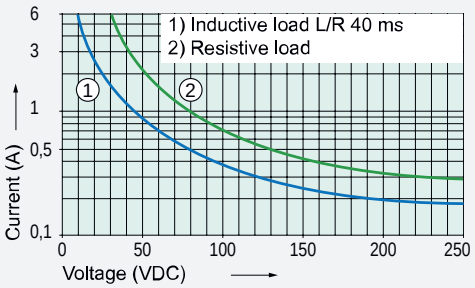
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

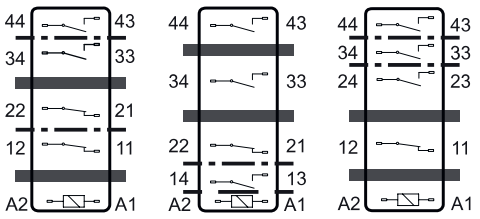


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 6 A MAX
AC-15:	240 V / 3 A MAX
DC-1:	24 V / 6 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX
Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of:	
1 or 2 contacts	6 A MAX
3 contacts	4 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



SIS222 SIS312 SIS312 KV2

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
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 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	

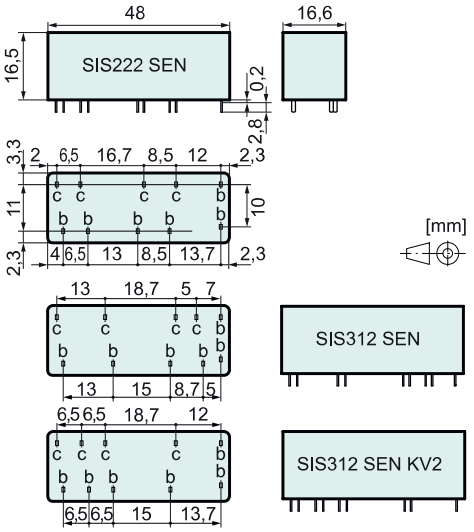
ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

Relays
SIS4 sensitive Series

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

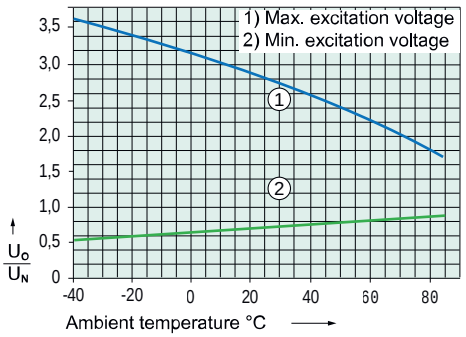


Pin dimension b	1,0 x 0,3 mm
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

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 %)



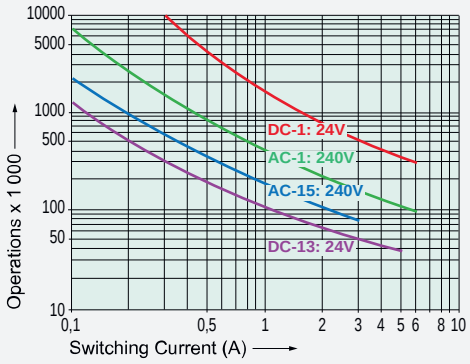
Test conditions:
- Graph 1: Contact current 4 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power 250 V / 6 A / AC-1 (max.)	1500 VA
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** with pre-fuse	1000 A SCPD 6 A gG / gL (fuse)

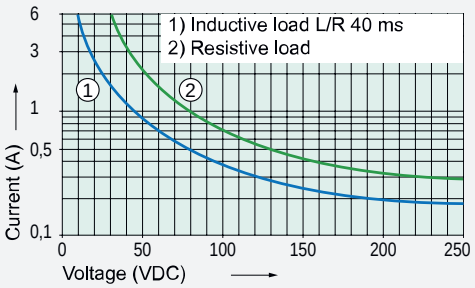
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

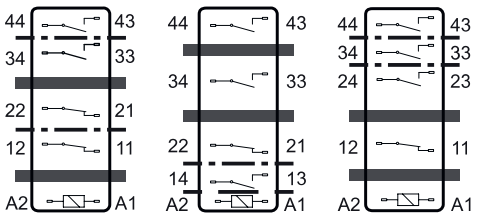


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 6 A MAX
AC-15:	240 V / 3 A MAX
DC-1:	24 V / 6 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX
Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of:	
1 or 2 contacts	6 A MAX
3 contacts	4 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



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
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 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	2 = Solder terminals
24VDC	Nominal coil voltage	
SEN	sensitive coil	
XX	Options	

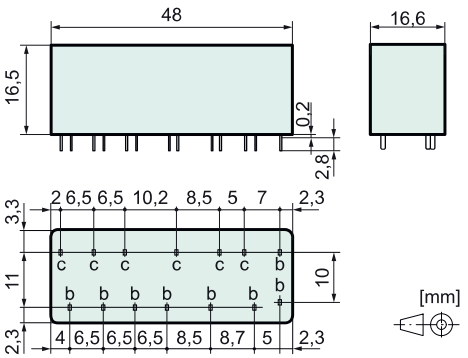
ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

Relays
SIS6 Series

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

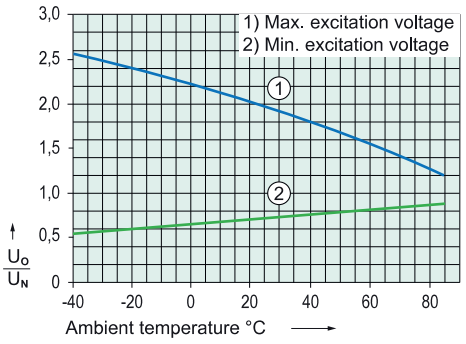


Pin dimension b	1,0 x 0,3 mm
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

Coil data at 20 °C

Nominal power (typ.)	0,66 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 %)



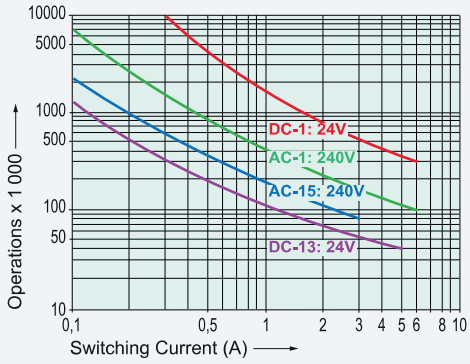
Test conditions:
- Graph 1: Contact current 4 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power 250 V / 6 A / AC-1 (max.)	1500 VA
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** with pre-fuse	1000 A SCPD 6 A gG / gL (fuse)

* Reference values ** Prospective short-circuit current

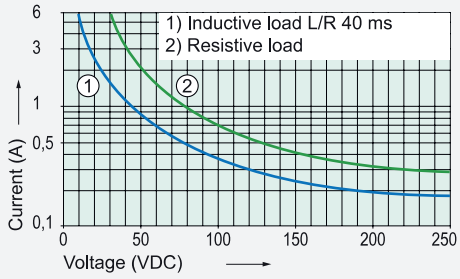
Electrical life (NO contacts)



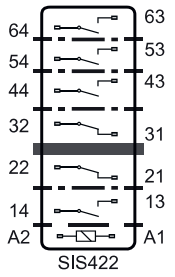
Switching capacity (IEC 61810-1)	
AC-1:	240 V / 6 A MAX
AC-15:	240 V / 3 A MAX
DC-1:	24 V / 6 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX

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
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	
- 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
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 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	

ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

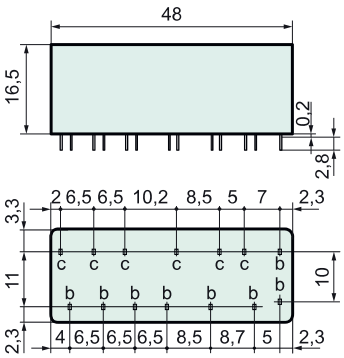
Relays

SIS6 sensitive Series

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

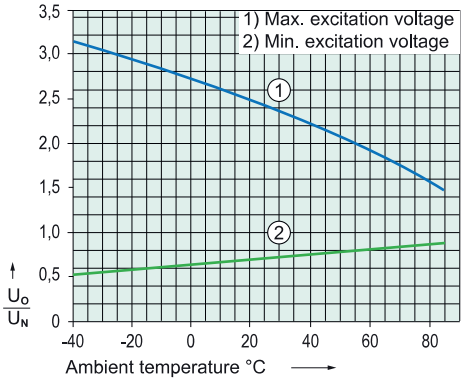


Pin dimension b	1,0 x 0,3 mm
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

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 %)



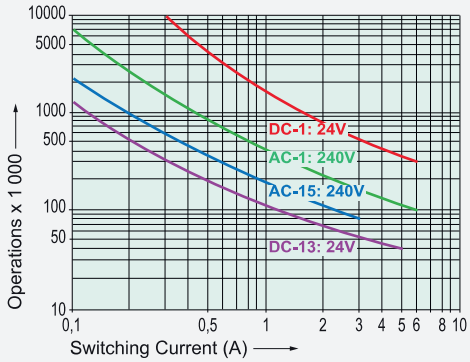
Test conditions:
- Graph 1: Contact current 4 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power 250 V / 6 A / AC-1 (max.)	1500 VA
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** with pre-fuse	1000 A SCPD 6 A gG / gL (fuse)

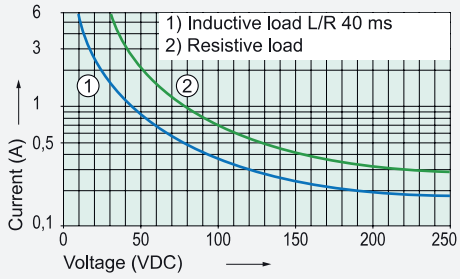
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

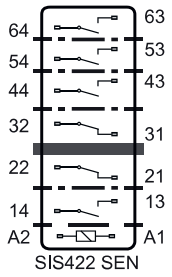


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 6 A MAX
AC-15:	240 V / 3 A MAX
DC-1:	24 V / 6 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX
Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of:	
1 or 2 contacts	6 A MAX
3 contacts	4 A MAX
4 contacts	3 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	
- 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
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 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

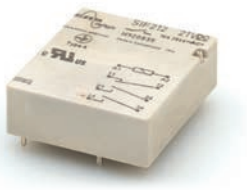
Product key

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	

ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

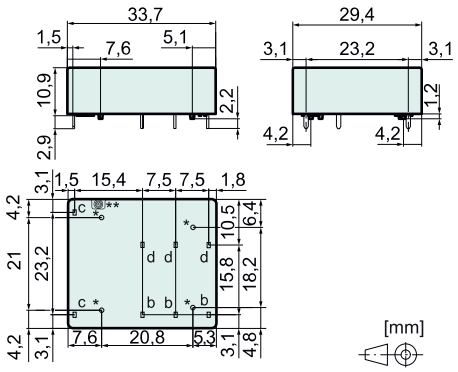
Relays
SIF3 Series



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



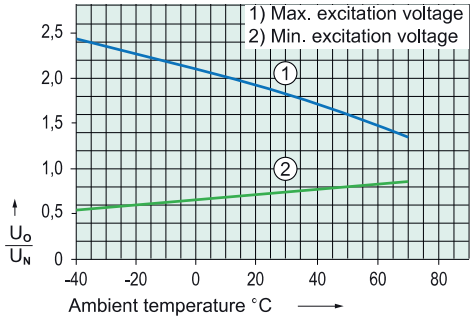
* do not drill under the relay if SMD is mounted
** open vent stack

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 %)



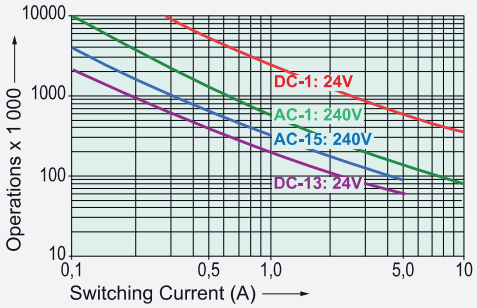
Test conditions:
- Graph 1: Contact current 6 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power 250 V / 10 A / AC-1 (max.)	2500 VA
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100000
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** 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)

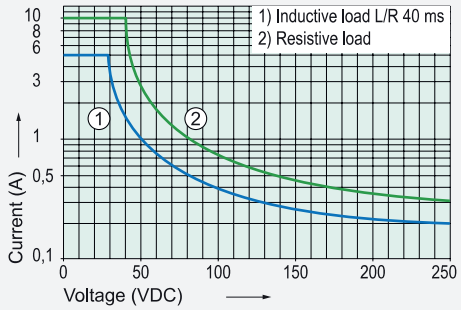
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

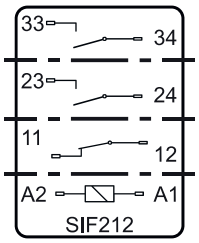


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 10 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 10 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX
Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of:	
1 contact	10 A MAX
2 contacts	8 A MAX

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	

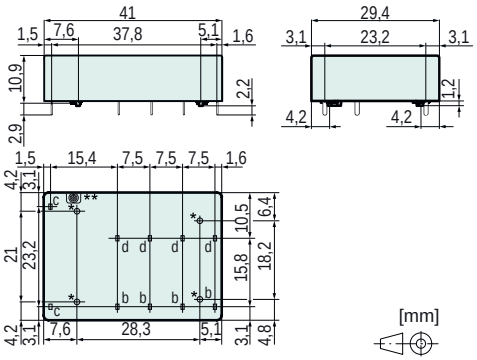
ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

Relays
SIF4 Series

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



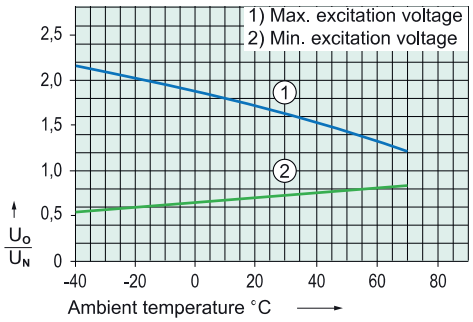
* do not drill under the relay if SMD is mounted
** open vent stack

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 %)



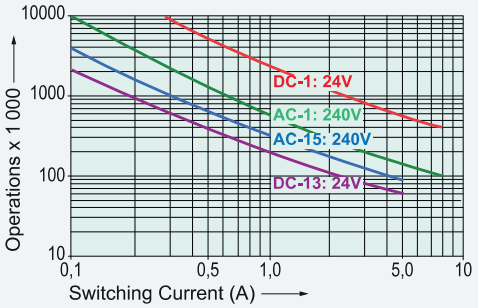
Test conditions:
- Graph 1: Contact current 5 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power 250 V / 8 A / AC-1 (max.)	2000 VA
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100000
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** 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)

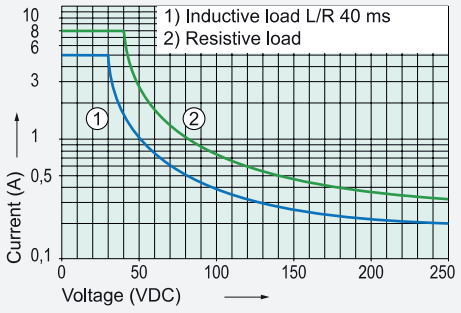
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

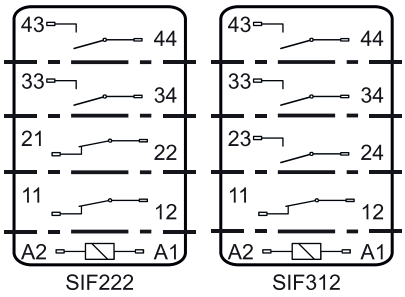


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 8 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 8 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX
Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of:	
1 or 2 contacts	8 A MAX
3 contacts	6 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
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	

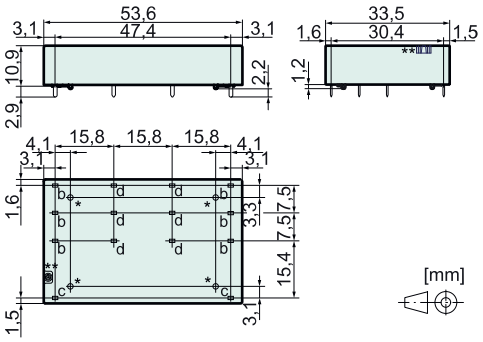
ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

Relays
SIF6 Series

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



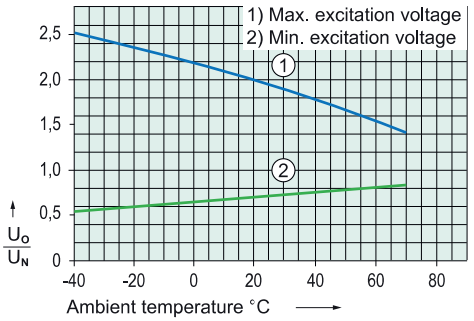
* do not drill under the relay if SMD is mounted
** open vent stack

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 %)



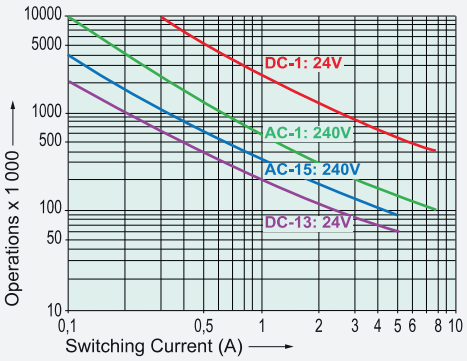
Test conditions:
- Graph 1: Contact current 5 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power 250 V / 8 A / AC-1 (max.)	2000 VA
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100000
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** 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)

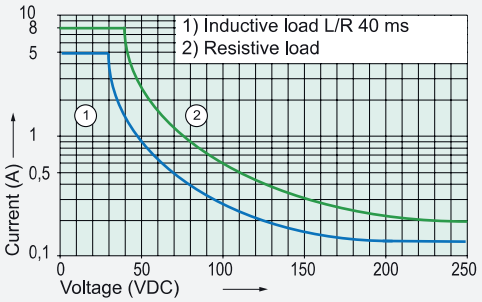
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

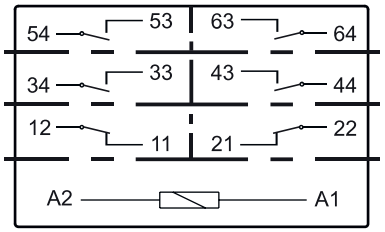


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 8 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 8 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX
Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of:	
1 or 2 contacts	8 A MAX
3 contacts	6 A MAX
4 contacts	4,5 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



SIF422

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	

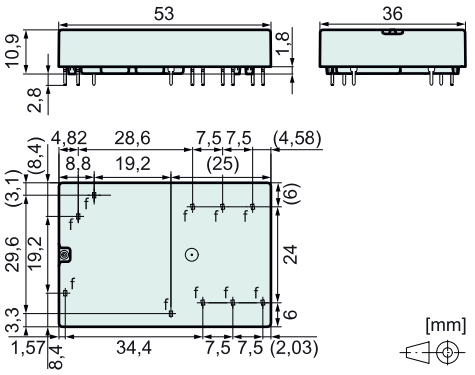
ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

Relays
SID4 Series

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 for solder connections	Ø 1,2 mm
Recomm. drilling on PCB* for ELO pins	Ø 1,0 mm + 0,09 / - 0,06 mm

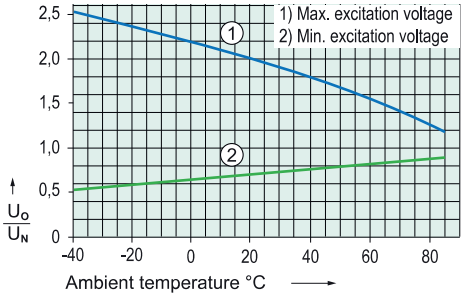
* with HAL surface, for other surfaces on request

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



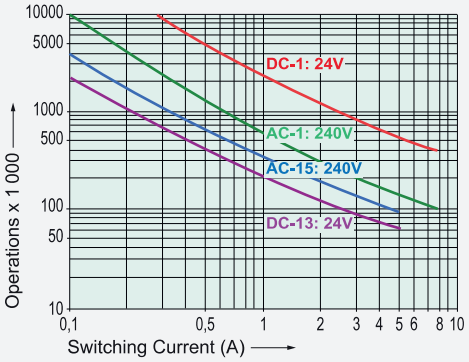
Test conditions:
- Graph 1: Contact current 5 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	$AgSnO_2$ + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power 250 V / 8 A / AC-1 (max.)	2000 VA
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100000
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** 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)

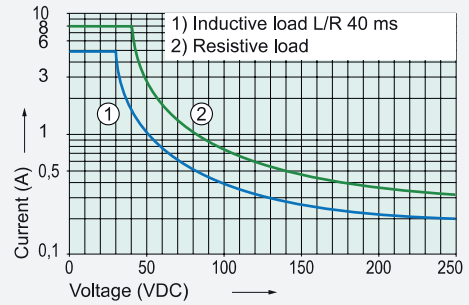
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

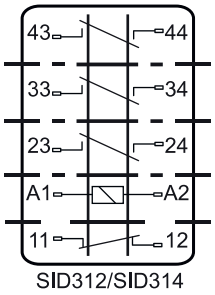


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 8 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 8 A MAX
DC-13:	24 V / 8 A MAX L/R = 40ms
Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of:	
1 or 2 contacts	8 A MAX
3 contacts	6 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



SID312/SID314

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	

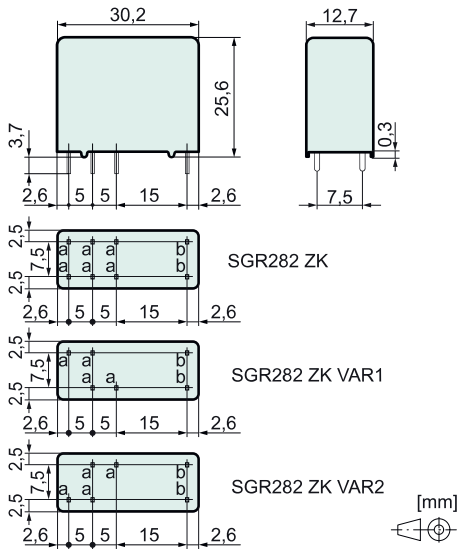
ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

Relays
SGR282 ZK Series

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

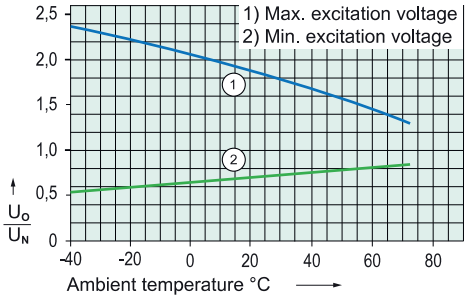


Pin dimension a	1,0 x 0,2 mm
Pin dimension b	1,0 x 0,3 mm
Recommended drilling on PCB	Ø 1,3 mm

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	3,8	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 %)



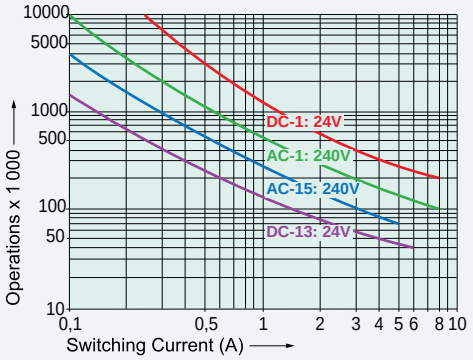
Test conditions:
- Graph 1: Contact current 4 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power 250 V / 8 A / AC-1 (max.)	2000 VA
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*	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)

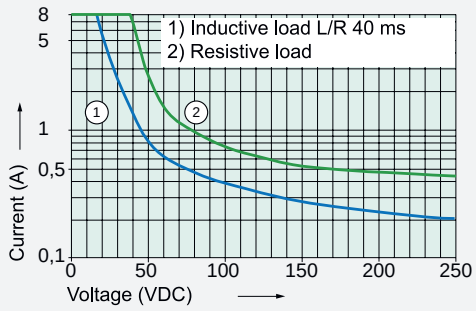
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

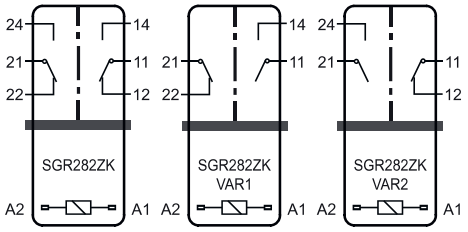


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 8 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 8 A MAX
DC-13:	24 V / 6 A / 0,1 Hz MAX
Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of: 1 or 2 contacts	8 A MAX

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.) 1,5g	NO: 10g / NC:
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

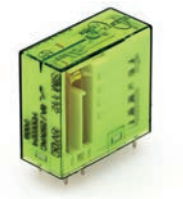
Product key

SGR282 ZK | VAR1 | 24VDC | XX

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

ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

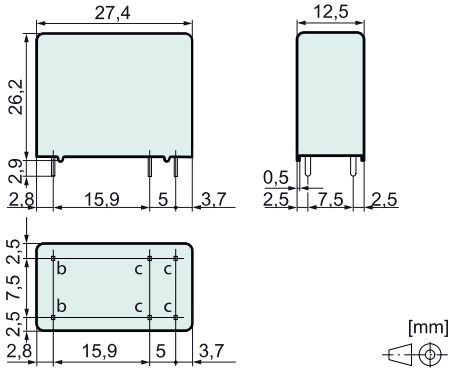
Relays
SIM2 Series



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



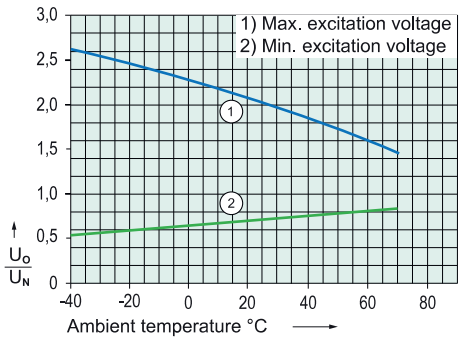
Pin dimension b	1,0 x 0,3 mm
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

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



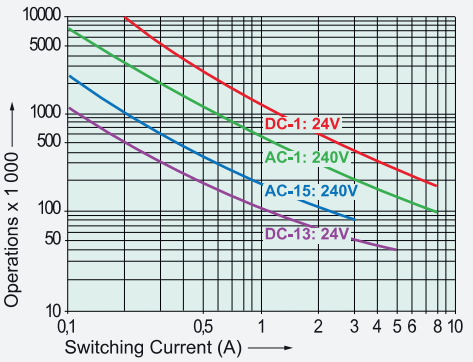
Test conditions:
- Graph 1: Contact current 6 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	$AgSnO_2$ + 0,2, ..., 0,4 µm Au
Contact type	crown contact
Rated switching power 250 V / 8 A / AC-1 (max.)	2 000 VA
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, ..., 2 000 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)

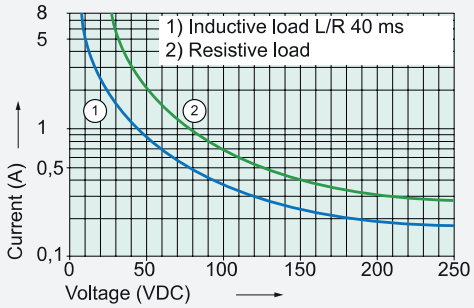
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

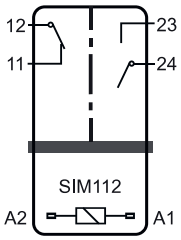


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 8 A MAX
AC-15:	240 V / 3 A MAX
DC-1:	24 V / 8 A MAX
DC-13:	24 V / 6 A / 0,1 Hz MAX
Switching capacity (UL 508)	C150, R300
Continuous current per contact at load of: 1 contact	8 A MAX

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	E188 953 Sec. 3

Options, Accessories

Other coil designs	possible

Product key

SIM 1 1 2 24VDC XX

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

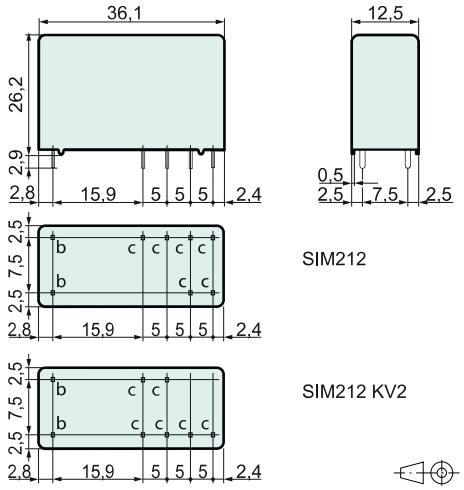
ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

Relays
SIM3 Series

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



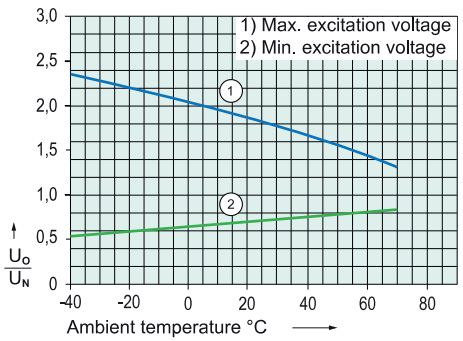
Pin dimension b	1,0 x 0,3 mm
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

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



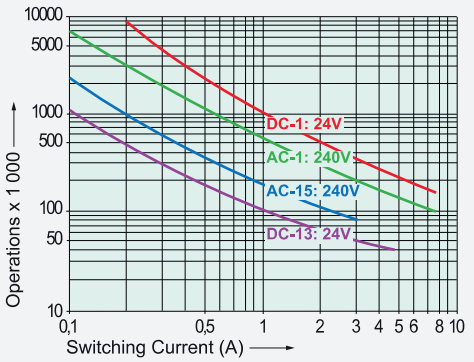
Test conditions:
- Graph 1: Contact current 6 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	$AgSnO_2$ + 0,2, ..., 0,4 µm Au
Contact type	crown contact
Rated switching power 250 V / 8 A / AC-1 (max.)	2000 VA
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100000
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** with pre-fuse	1000 A SCPD 10 A gG / gL (fuse)

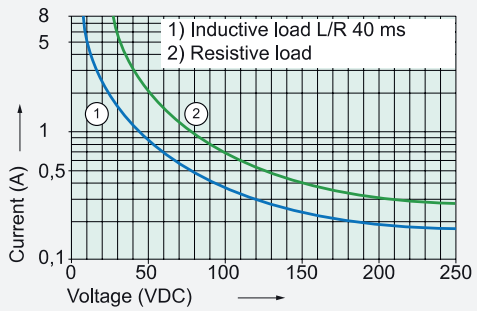
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

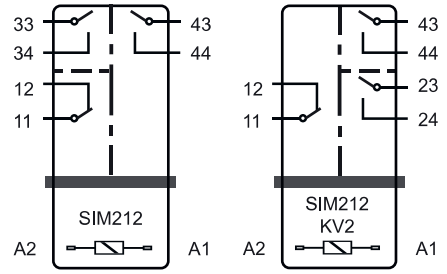


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 8 A MAX
AC-15:	240 V / 3 A MAX
DC-1:	24 V / 8 A MAX
DC-13:	24 V / 6 A / 0,1 Hz MAX
Switching capacity (UL 508)	C150, R300
Continuous current per contact at load of: 1 or 2 contacts	8 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	
- 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
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 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	

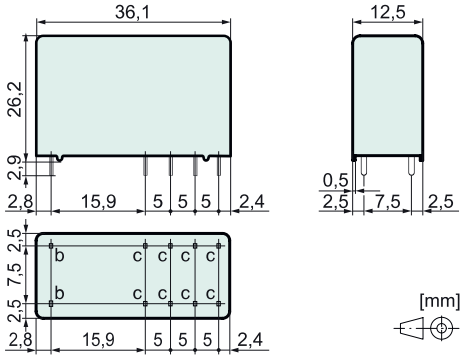
ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

Relays
SIM4 Series

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



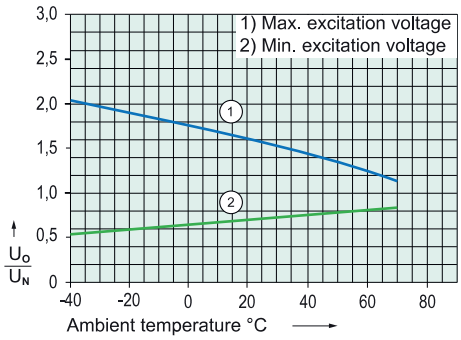
Pin dimension b	1,0 x 0,3 mm
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

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



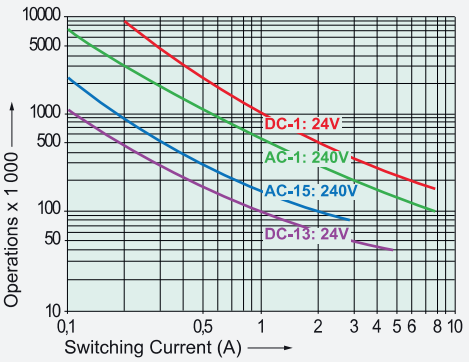
Test conditions:
- Graph 1: Contact current 6 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	$AgSnO_2$ + 0,2, ..., 0,4 µm Au
Contact type	crown contact
Rated switching power 250 V / 8 A / AC-1 (max.)	2000 VA
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100000
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** with pre-fuse	1000 A SCPD 10 A gG / gL (fuse)

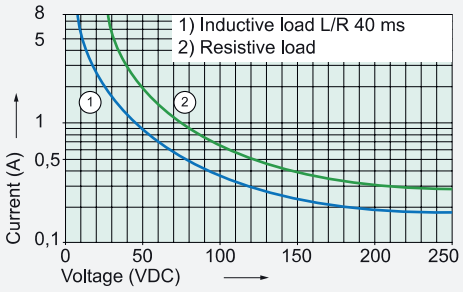
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

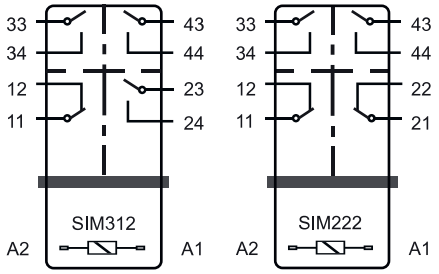


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 8 A MAX
AC-15:	240 V / 3 A MAX
DC-1:	24 V / 8 A MAX
DC-13:	24 V / 6 A / 0,1 Hz MAX
Switching capacity (UL 508)	C150, R300
Continuous current per contact at load of:	
1 or 2 contacts	8 A MAX
3 contacts	6 A MAX

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
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 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

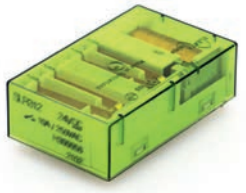
Product key

SIM 3 1 2 24VDC XX

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

ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

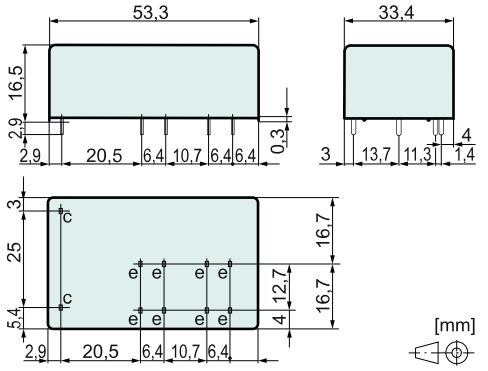
Relays
SLR4 Series



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



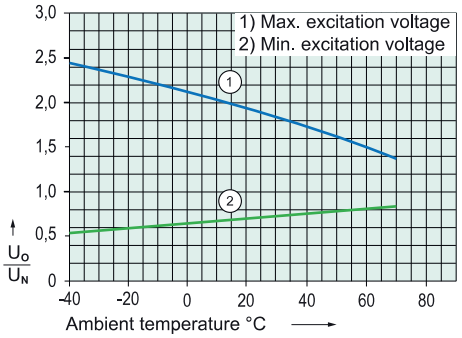
Pin dimension c	1,0 x 0,4 mm
Pin dimension e	1,0 x 0,6 mm
Recommended drilling on PCB	Ø 1,3 mm

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	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



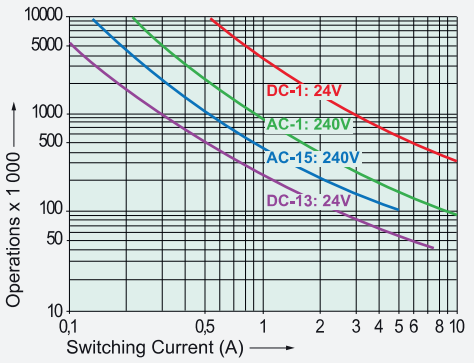
Test conditions:
- Graph 1: Contact current 6 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	$AgSnO_2$ + 0,2, ..., 0,4 µm Au
Contact type	crown contact
Rated switching power 250 V / 10 A / AC-1 (max.)	2500 VA
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100000
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**	1000 A
with pre-fuse	SCPD 10 A gG / gL (fuse)

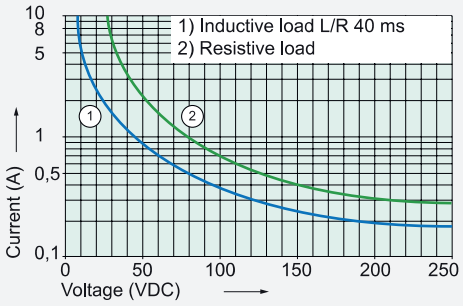
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

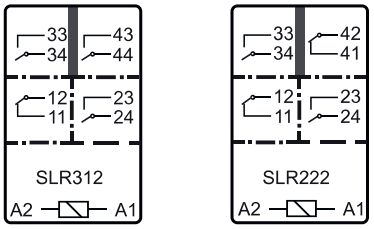


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 10 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 10 A MAX
DC-13:	24 V / 7,5 A / 0,1 Hz MAX
Switching capacity (UL 508)	C600, R300
Continuous current per contact at load of:	
1 or 2 contacts	10 A MAX
3 contacts	8,4 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	
- 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: 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 2 2 2 24VDC XX

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	

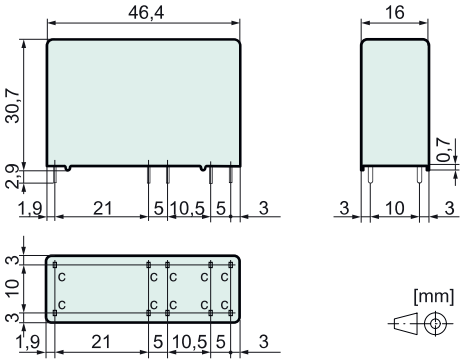
ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

Relays
SIR4 Series

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



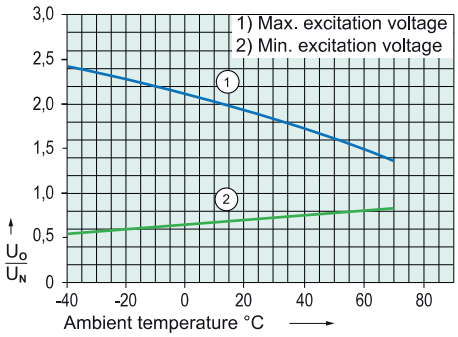
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

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	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



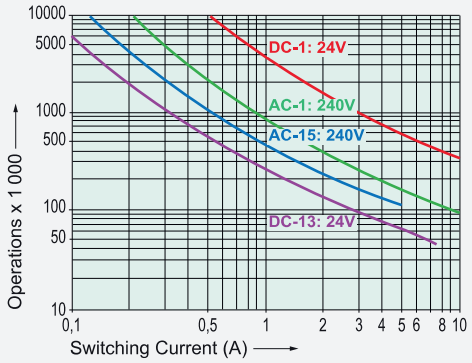
Test conditions:
- Graph 1: Contact current 6 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	$AgSnO_2$ + 0,2, ..., 0,4 µm Au
Contact type	crown contact
Rated switching power 250 V / 10 A / AC-1 (max.)	2500 VA
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100000
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**	1000 A
with pre-fuse	SCPD 10 A gG / gL (fuse)

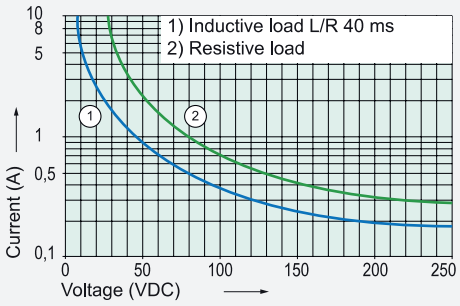
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

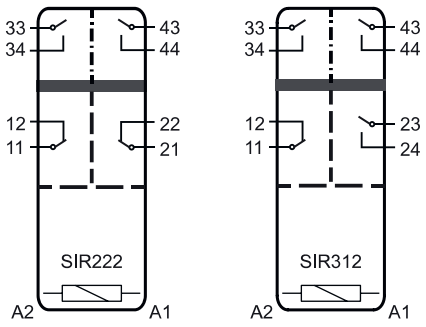


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 10 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 10 A MAX
DC-13:	24 V / 7,5 A / 0,1 Hz MAX
Switching capacity (UL 508)	C600, R300
Continuous current per contact at load of:	
1 or 2 contacts	10 A MAX
3 contacts	8,4 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	
- 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: 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 3 1 2 24VDC XX

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	

ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

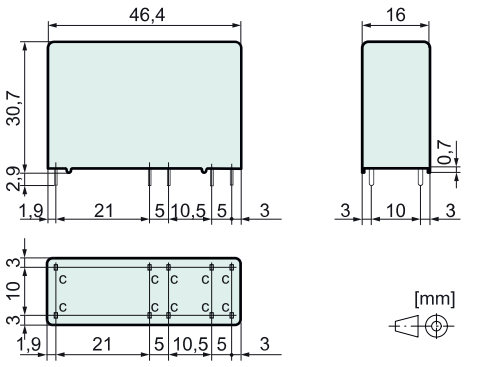
Relays

SIR4 sensitive Series

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



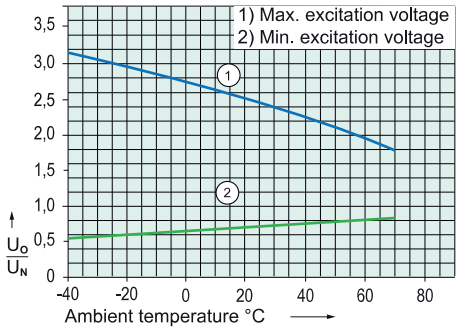
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

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



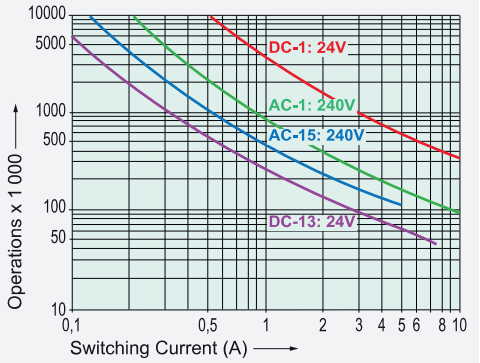
Test conditions:
- Graph 1: Contact current 6 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	$AgSnO_2$ + 0,2, ..., 0,4 µm Au
Contact type	crown contact
Rated switching power 250 V / 10 A / AC-1 (max.)	2500 VA
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100000
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** with pre-fuse	1000 A SCPD 10 A gG / gL (fuse)

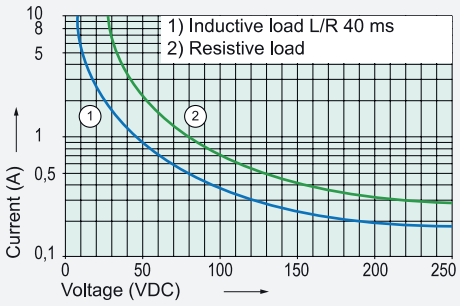
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

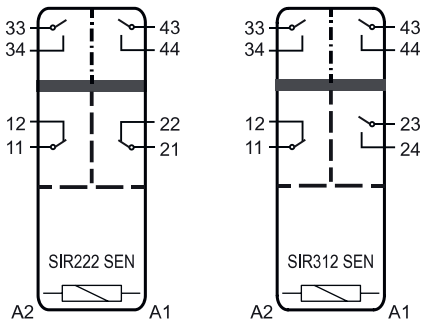


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 10 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 10 A MAX
DC-13:	24 V / 7,5 A / 0,1 Hz MAX
Switching capacity (UL 508)	C600, R300
Continuous current per contact at load of:	
1 or 2 contacts	10 A MAX
3 contacts	8,4 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



Insulation data

Rated insulation voltage (IEC 60664-1)	250 VAC
Basic insulation	
- 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: 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

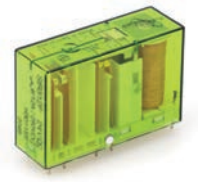
Product key

SIR 3 1 2 24VDC SEN XX

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	

ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

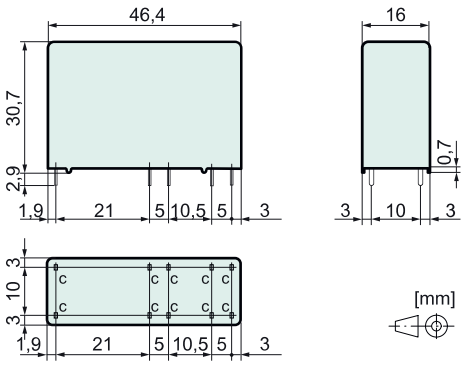
Relays
SIR4 Power Series



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



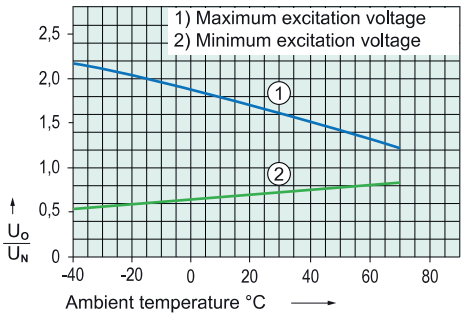
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

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

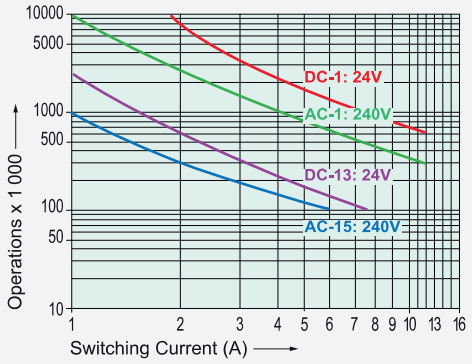
Contact resistance as new (max.)	100 mΩ

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 250 V / 6 A / AC-1 (max.)	1500 VA
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** with pre-fuse	1000 A 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 480 V / 12 A / AC-1 (max.)	5760 VA
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** with pre-fuse	1000 A SCPD 16 A gG / gL (fuse)

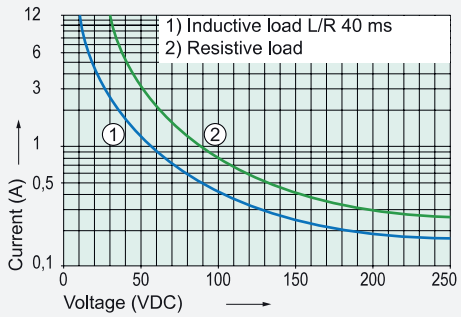
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

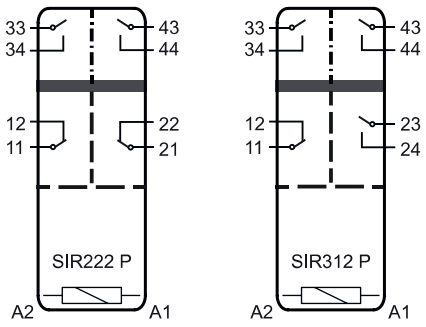


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 12 A MAX
AC-15:	240 V / 6 A MAX
DC-1:	24 V / 12 A MAX
DC-13:	24 V / 7,5 A / 0,1 Hz MAX
Switching capacity (UL 508)	C600, R300
Continuous current per contact at load of: 1 or 2 contacts	12 A MAX

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: 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

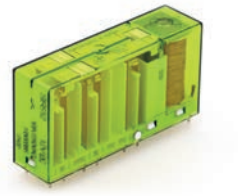
Product key

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	

ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

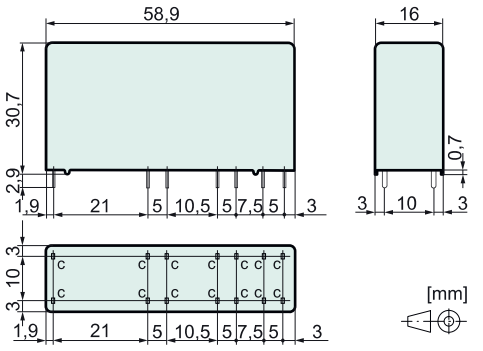
Relays
SIR6 Series



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



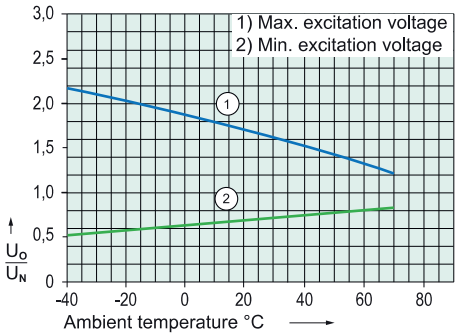
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

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



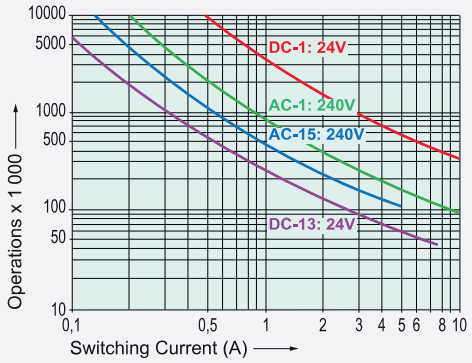
Test conditions:
- Graph 1: Contact current 6 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	$AgSnO_2$ + 0,2, ..., 0,4 µm Au
Contact type	crown contact
Rated switching power 250 V / 10 A / AC-1 (max.)	2500 VA
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100000
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** with pre-fuse	1000 A SCPD 10 A gG / gL (fuse)

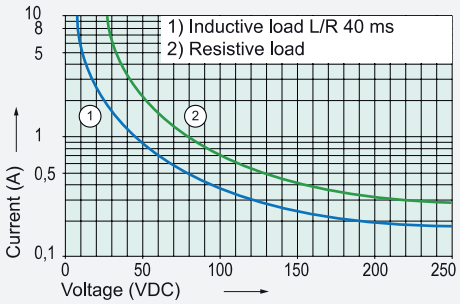
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

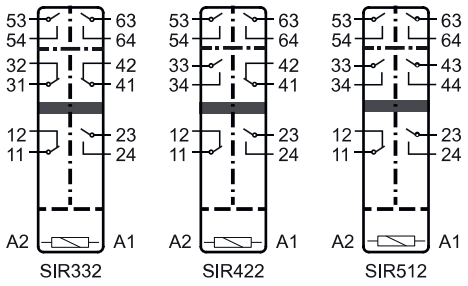


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 10 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 10 A MAX
DC-13:	24 V / 7,5 A / 0,1 Hz MAX
Switching capacity (UL 508)	C600, R300
Continuous current per contact at load of:	
1 or 2 contacts	10 A MAX
3 contacts	8,4 A MAX
4 contacts	7,3 A MAX
5 contacts	6 A MAX

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

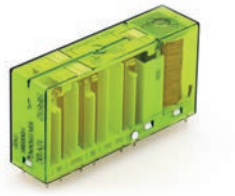
Product key

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	

ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

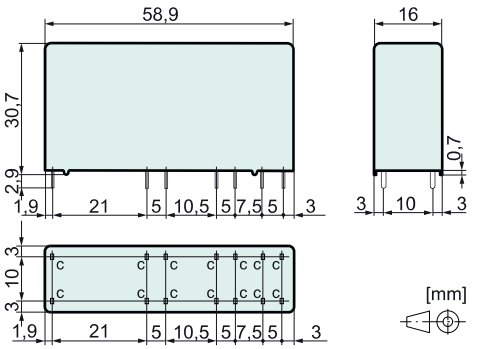
Relays
SIR6 sensitive Series



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



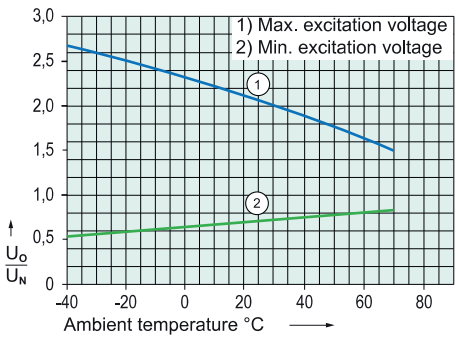
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

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



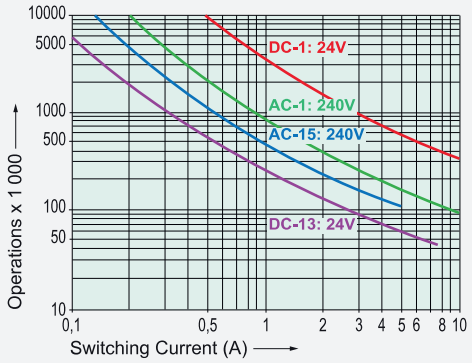
Test conditions:
- Graph 1: Contact current 6 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	$AgSnO_2$ + 0,2, ..., 0,4 µm Au
Contact type	crown contact
Rated switching power 250 V / 10 A / AC-1 (max.)	2500 VA
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100000
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**	1000 A
with pre-fuse	SCPD 10 A gG / gL (fuse)

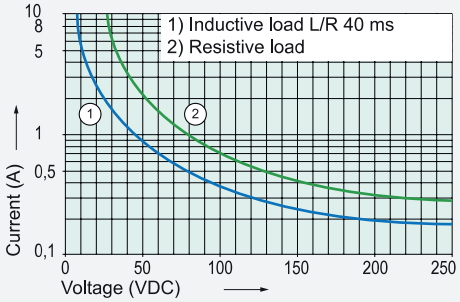
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

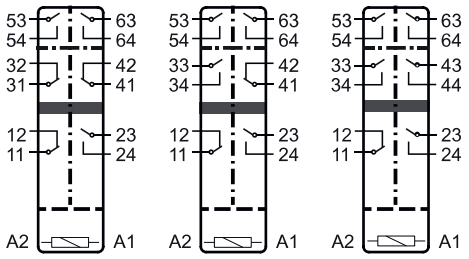


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 10 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 10 A MAX
DC-13:	24 V / 7,5 A / 0,1 Hz MAX
Switching capacity (UL 508)	C600, R300
Continuous current per contact at load of:	
1 or 2 contacts	10 A MAX
3 contacts	8,4 A MAX
4 contacts	7,3 A MAX
5 contacts	6 A MAX

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.)	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	

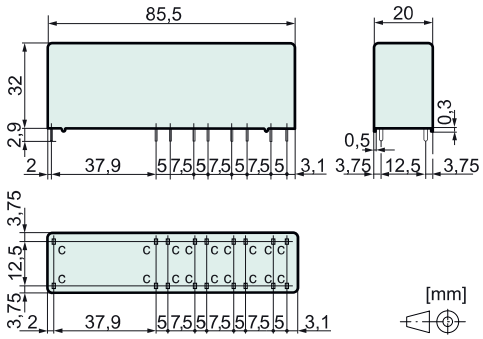
ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

Relays
SIR8 Series

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



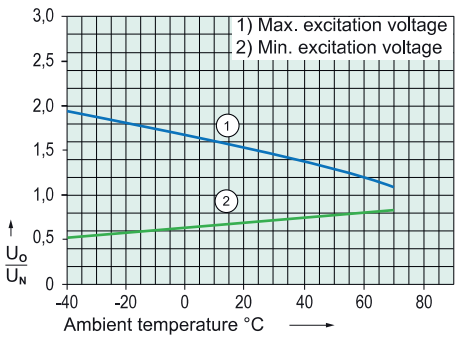
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

Coil data at 20 °C

Nominal power (typ.)	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



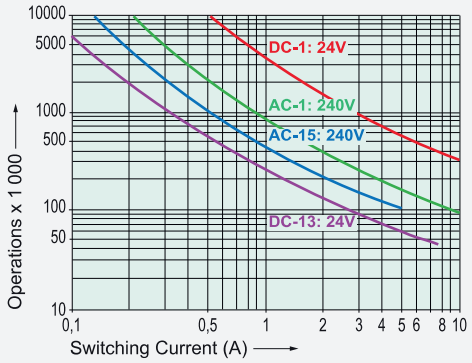
Test conditions:
- Graph 1: Contact current 6 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	$AgSnO_2$ + 0,2, ..., 0,4 µm Au
Contact type	crown contact
Rated switching power 250 V / 10 A / AC-1 (max.)	2500 VA
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100000
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**	1000 A
with pre-fuse	SCPD 10 A gG / gL (fuse)

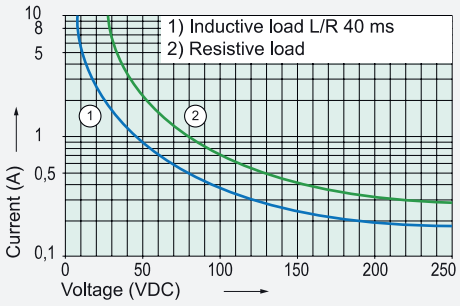
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

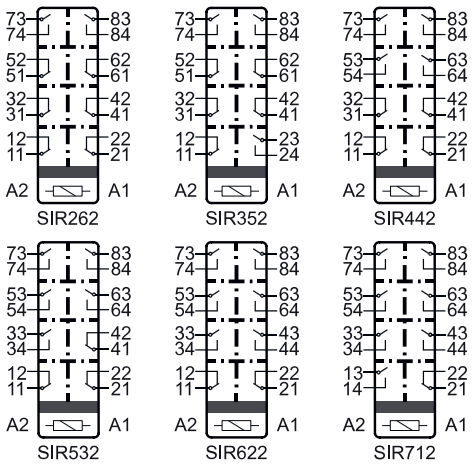


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 10 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 10 A MAX
DC-13:	24 V / 7,5 A / 0,1 Hz MAX
Switching capacity (UL 508)	C600, R300
Continuous current per contact at load of:	
1 or 2 contacts	10 A MAX
3 contacts	8,4 A MAX
4 contacts	7,3 A MAX
5 contacts	6,5 A 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

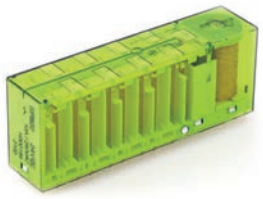
Product key

SIR 3 5 2 24VDC XX

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	

ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

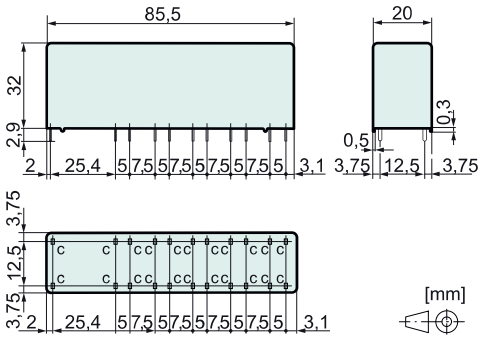
Relays
SIR10 Series



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



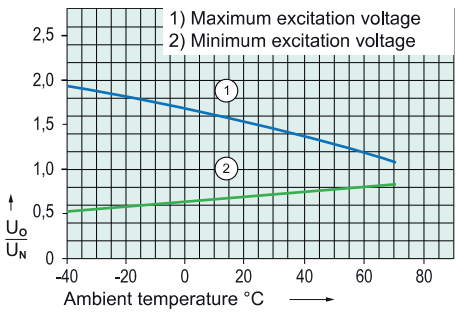
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

Coil data at 20 °C

Nominal power (typ.)	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



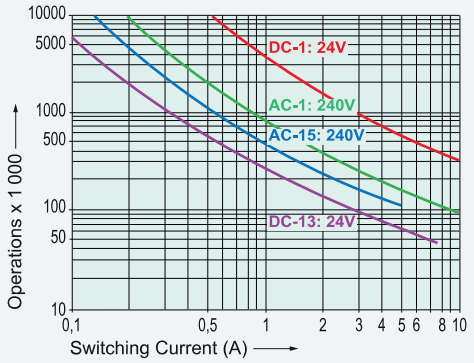
Test conditions:
- Graph 1: Contact current 6 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

Contact data

Contact material	$AgSnO_2$ + 0,2, ..., 0,4 µm Au
Contact type	crown contact
Rated switching power 250 V / 10 A / AC-1 (max.)	2500 VA
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100000
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** with pre-fuse	1000 A SCPD 10 A gG / gL (fuse)

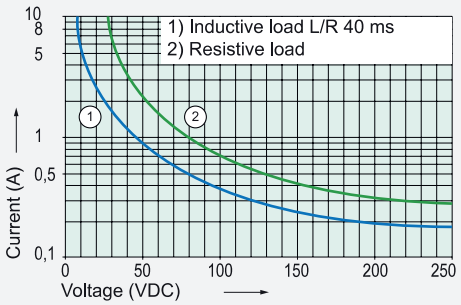
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

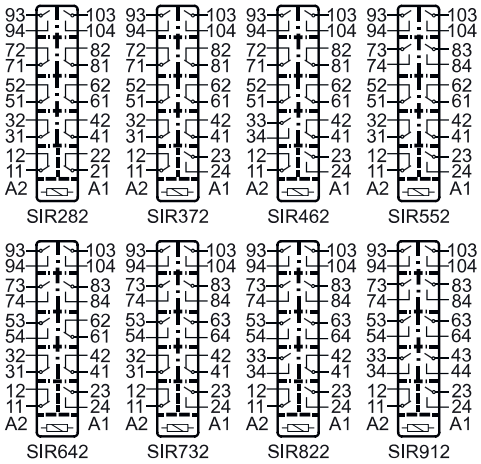


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 10 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 10 A MAX
DC-13:	24 V / 7,5 A / 0,1 Hz MAX
Switching capacity (UL 508)	C600, R300
Continuous current per contact at load of:	
1 or 2 contacts	10 A MAX
3 contacts	8,4 A MAX
4 contacts	7,3 A MAX
5 contacts	6,5 A 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

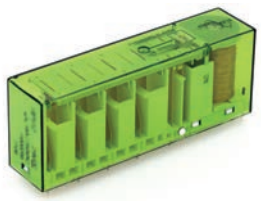
Product key

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	

ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

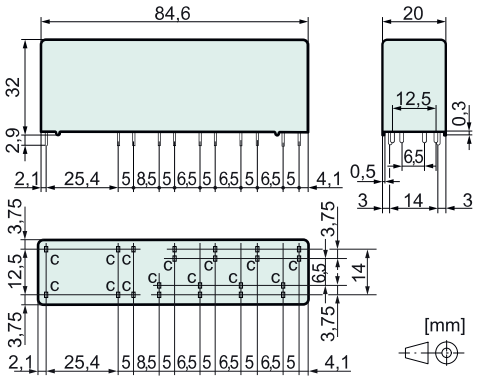
Relays
SIP6 Series



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



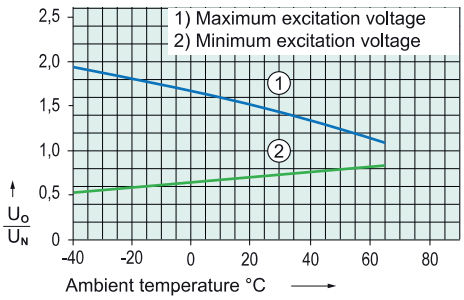
Pin dimension c	1,0 x 0,4 mm
Recommended drilling on PCB	Ø 1,3 mm

Coil data at 20 °C

Nominal power (typ.)	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



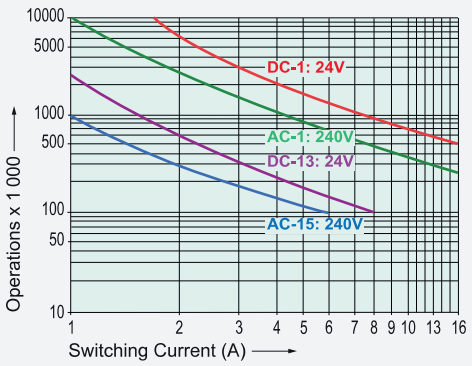
Test conditions:
- Graph 1: Contact current
  contacts 11-12, 21-22, 23-24: 4 A MAX,
  contacts 33-34, 43-44, 53-54, 63-64: 12 A MAX
- Graph 2: without previous operation
- Free-standing relay on PCB
- Duty cycle 100%

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 250 V / 6 A / AC-1 (max.)	1500 VA
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 250 V(400 V / 16 A / AC-1 (max.)	4000 VA
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)

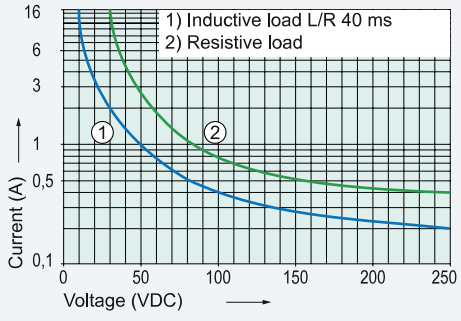
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

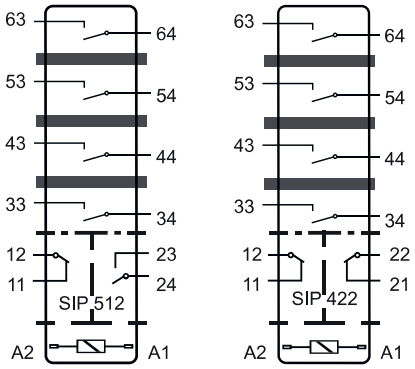


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 16 A MAX
AC-15:	240 V / 6 A MAX
DC-1:	24 V / 16 A MAX
DC-13:	24 V / 8 A / 0,1 Hz MAX
Switching capacity (UL 508)	A600, R150
Continuous current per contact at load of:	
1 or 2 contacts	16 A MAX
3 contacts	12 A MAX
4 contacts	10 A MAX

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	2 = Solder terminals
24VDC	Nominal coil voltage	
XX	Options	

ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

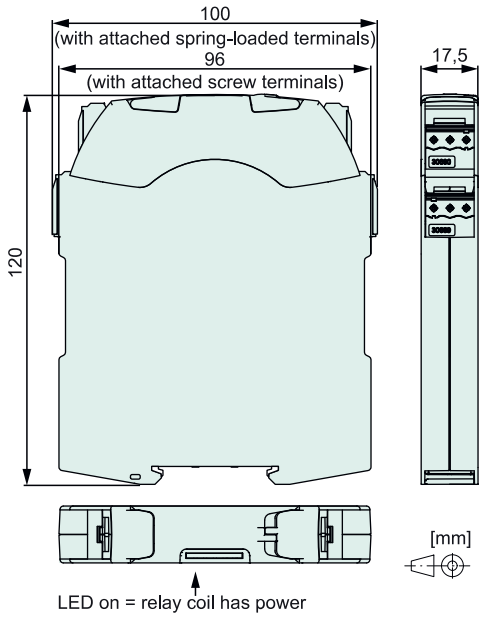
Relay module
SMD4 Series

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

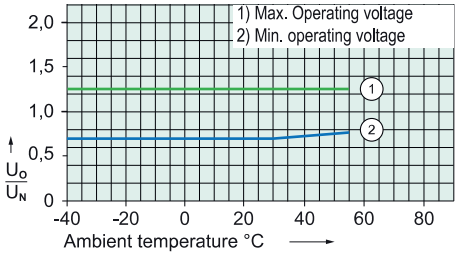
* User is responsible for correct integration!

Dimensions



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



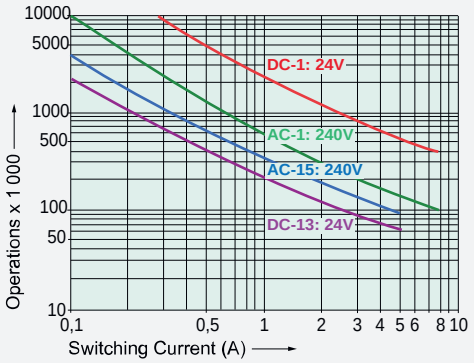
Test conditions:
- Graph 1: Contact current 5 A MAX
- Graph 2: without previous operation
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power 250 V / 8 A / AC-1 (max.)	2000 VA
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100000
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)

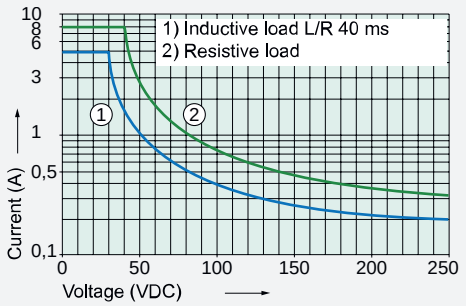
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

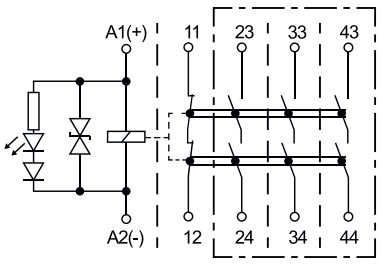


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 8 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 8 A MAX
DC-13:	24 V / 5 A MAX L/R = 40 ms
Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of:	
1 or 2 contacts	8 A MAX
3 contacts	6 A MAX

Contact load limit curve (DC)



Circuit diagram (top view)



SMD318 / SMD319

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	

ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

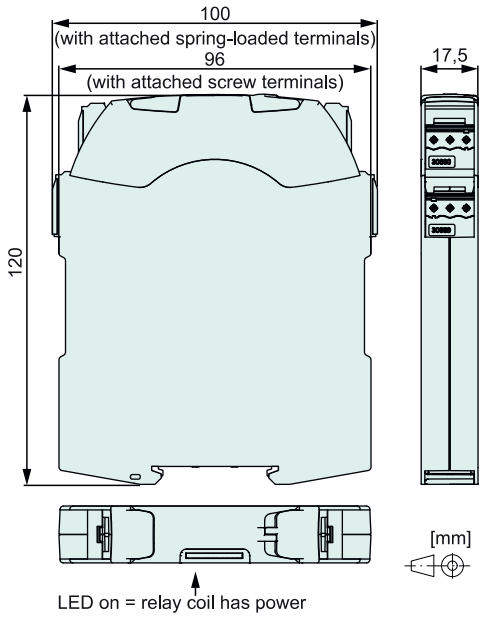
Relay module
SMF3 Series

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

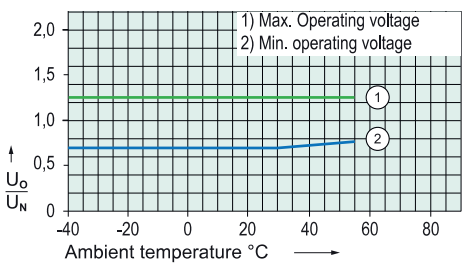
* User is responsible for correct integration!

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



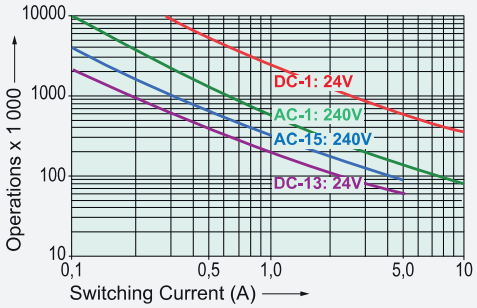
Test conditions:
- Graph 1: Contact current 6 A MAX
- Graph 2: without previous operation
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power 250 V / 10 A / AC-1 (max.)	2500 VA
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100000
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** 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)

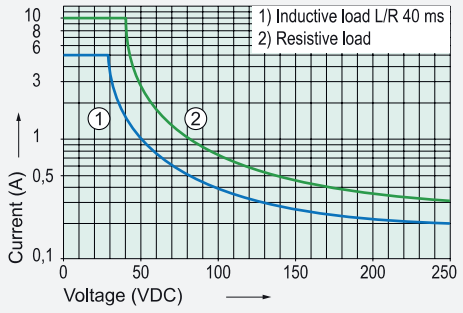
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

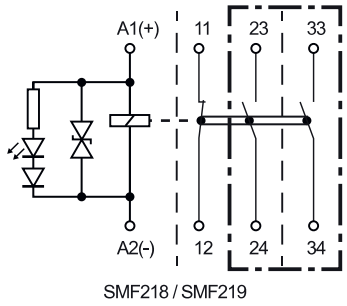


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 10 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 10 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX
Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of:	
1 contact	10 A MAX
2 contacts	8 A MAX

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 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

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	

ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

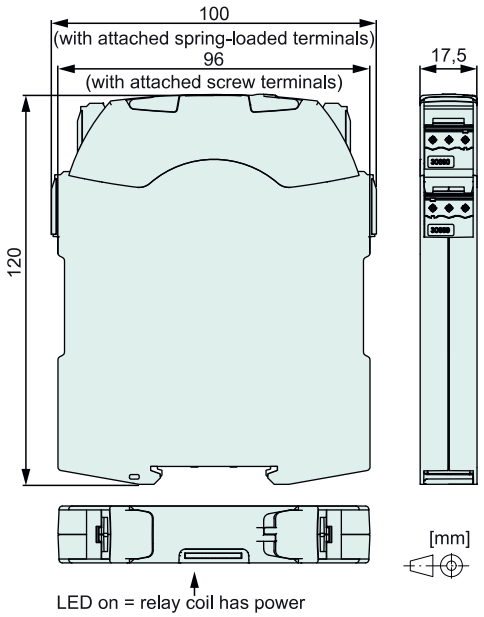
Relay module
SMF4 Series

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

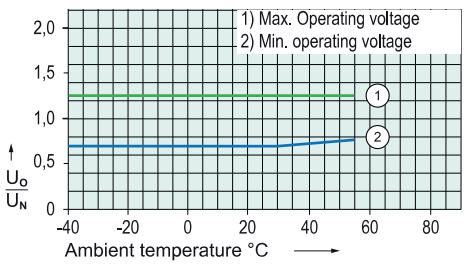
* User is responsible for correct integration!

Dimensions



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



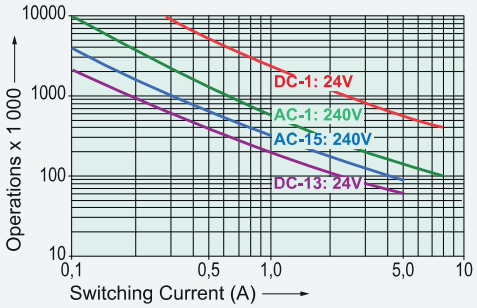
Test conditions:
- Graph 1: Contact current 6 A MAX
- Graph 2: without previous operation
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power 250 V / 8 A / AC-1 (max.)	2000 VA
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100000
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** 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)

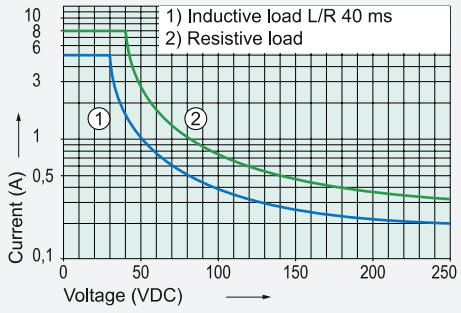
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

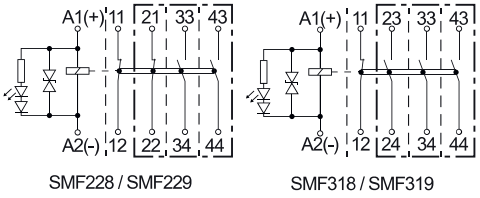


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 8 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 8 A MAX
DC-13:	24 V / 5 A MAX
Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of:	
1 or 2 contacts	8 A MAX
3 contacts	6 A MAX

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 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

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	

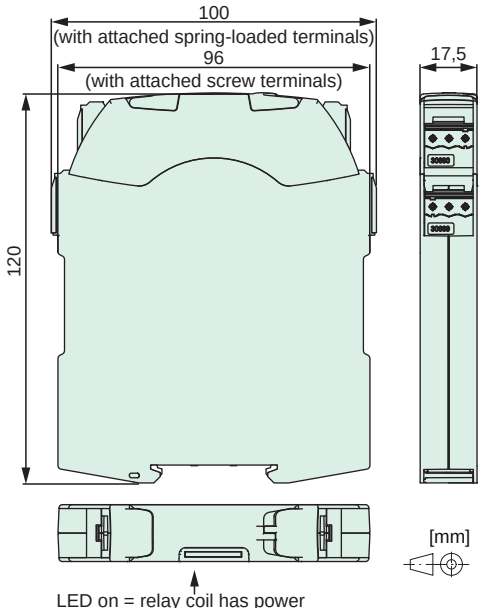
Relay module
SMF5 Series

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

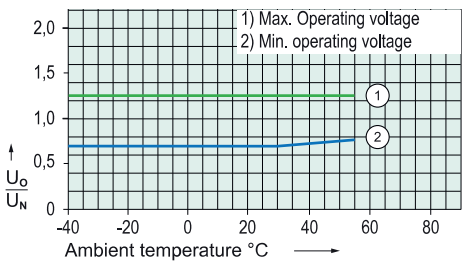
* User is responsible for correct integration!

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



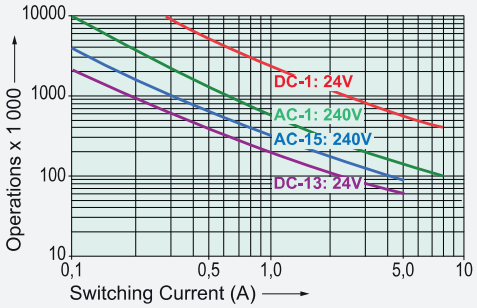
Test conditions:
- Graph 1: Contact current 5 A MAX
- Graph 2: without previous operation
- Duty cycle 100%

Contact data

Contact material	AgCuNi + 0,2, ..., 0,4 µm Au
Type of contact	Single contact with notched crown
Rated switching power 250 V / 8 A / AC-1 (max.)	2000 VA
Electr. life time (0,1 Hz, rel. duty cycle 10%)	100000
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** 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)

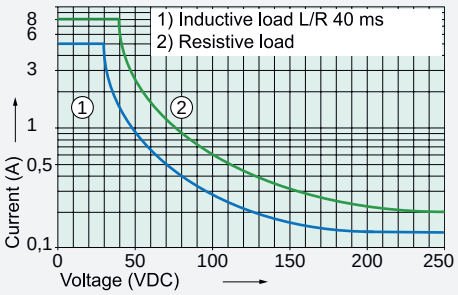
* Reference values ** Prospective short-circuit current

Electrical life (NO contacts)

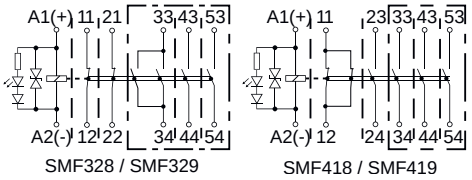


Switching capacity (IEC 61810-1)	
AC-1:	240 V / 8 A MAX
AC-15:	240 V / 5 A MAX
DC-1:	24 V / 8 A MAX
DC-13:	24 V / 5 A / 0,1 Hz MAX
Switching capacity (UL 508)	B300, R300
Continuous current per contact at load of:	
1 or 2 contacts	8 A MAX
3 contacts	6 A MAX
4 contacts	4,5 A MAX

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

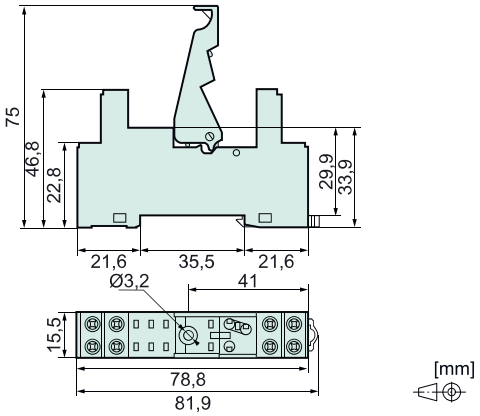
Product key

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

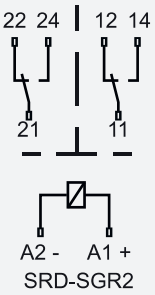
Features
- Plug-in socket with screw terminals
- For relay series SGR282 ZK (VAR1, VAR2)
- With plastic retaining bracket
- Identification plate (1 piece)
- Mounting
  - on mounting rail 35 mm (IEC 60715)
  - central mounting with M3 screw

Dimensions


Technical data

Limit continuous current*	8 A
Rated voltage	300 VAC
Connections:	
- Cross sections for wire	2 x 2,5 mm²
- Cross sections for stranded wire	2 x 1,5 mm²
- 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

Other data

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

Mounting instructions

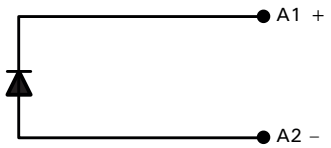
Mounting	on 35 mm mounting rail (IEC 60715)
Mounting	with central fastening Screw M3
- Torque	max. 1,28 Nm

Product key
SRD SGR2

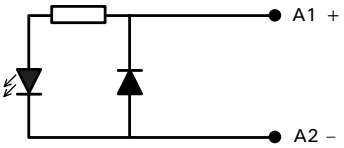
SRD	Socket type	Mounting rail socket
SGR2	Relay series	SGR282 ZK

Options, Accessories

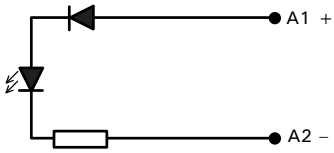
SRD SGR2 M01
- Integrated freewheeling diode
- Suitable for 6 VDC to 230 VDC (+ at terminal A1)



SRD SGR2 M03
- Integrated freewheeling diode
- green LED
- Suitable for 6 VDC to 24 VDC(+ at terminal A1)



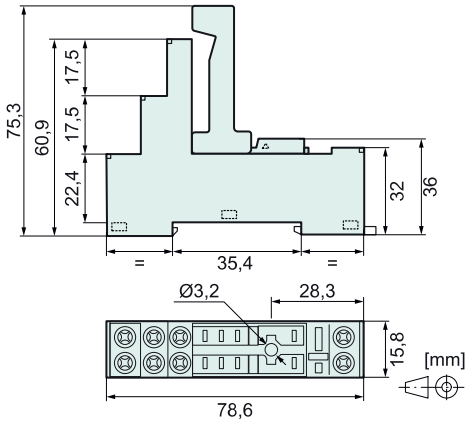
SRD SGR2 M05
- green LED
- Integrated reverse polarity protection
- Suitable for 6 VDC to 24 VDC (+ at terminal A1)



ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

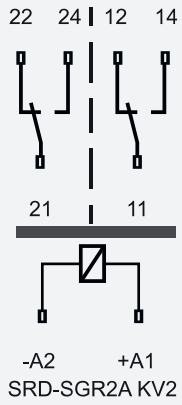
Mounting rail socket
SRD SGR2A KV2
for SGR282 ZK

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 mm² or 2 x 2,5 mm²
- Cross sections for strand. wire	1 x 6 mm² or 2 x 2,5 mm²
- 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

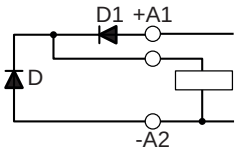
Other data
Ambient temperature	-40 °C ... +70 °C
Approvals	cULus
UL File	E135170

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

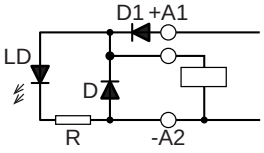
Product key
SRD SGR2 A KV2

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



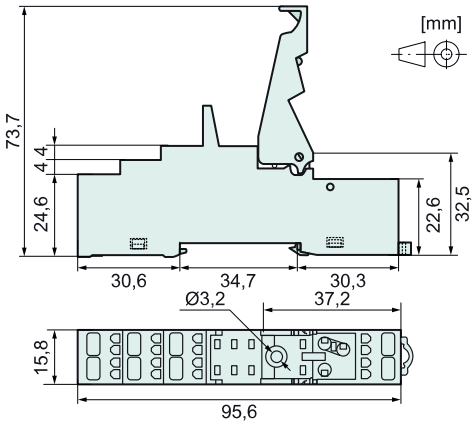
SRD SGR2A M03
- Integrated freewheeling diode
- Integrated reverse polarity protection
- green LED
- Suitable for 6 VDC to 24 VDC



ELESTA GmbH, Heuteilstrasse 18,
CH - 7310 Bad Ragaz, Switzerland
Phone: +41 81 303 54 00
Worldwide: www.elesta-gmbh.com

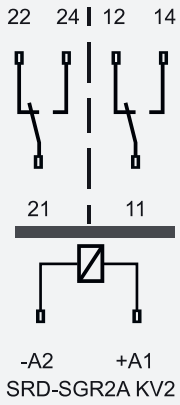
Mounting rail socket
SRD SGR2A KV2 PIK
for SGR282 ZK

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 mm² or 2 x 2,5 mm²
- Cross sections for strand. wire	1 x 6 mm² or 2 x 2,5 mm²

*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

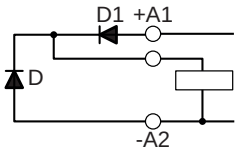
Other data
Ambient temperature	-40 °C ... +70 °C
Approvals	cULus
UL File	E135170

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

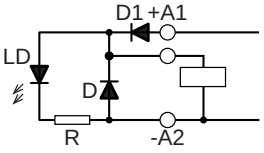
Product key
SRD SGR2 A KV2 PIK

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



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CH - 7310 Bad Ragaz, Switzerland
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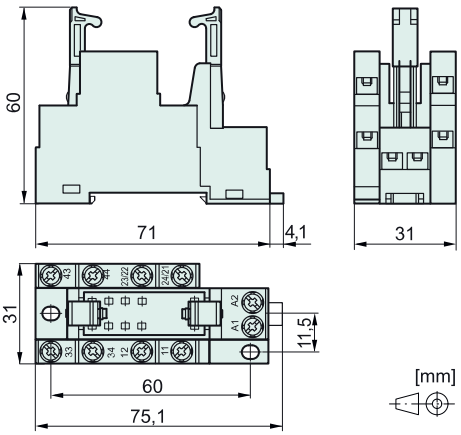
Mounting rail socket
SRD SIM4
for SIM4

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

Dimensions

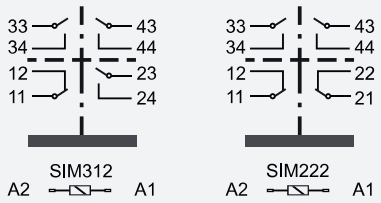


Technical data

Limit continuous current*	8 A
Rated voltage	250 VAC
Connections:	
- Cross sections for wire	2 x 2,5 mm²
- Cross sections for stranded wire	2 x 1,5 mm²
- 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.)	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

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

Options, Accessories
none available

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Mounting rail socket

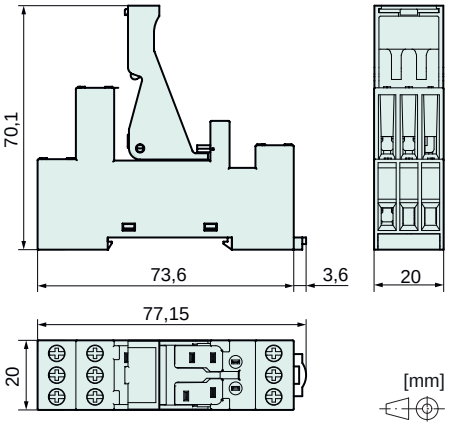
SRD SIS3

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

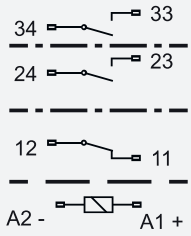


Technical data

Limit continuous current*	6 A
Rated voltage	250 VAC
Connections:	
- Cross sections for wire	2 x 2,5 mm²
- Cross sections for stranded wire	2 x 1,5 mm²
- 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

Other data

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

Mounting instructions

Mounting	on 35 mm mounting rail (IEC 60715)

Product key

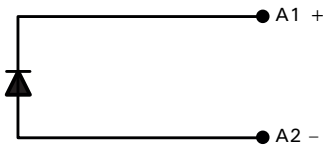
SRD SIS3

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

Options, Accessories

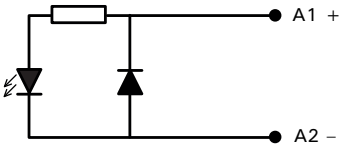
SRD SGR2 M01

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



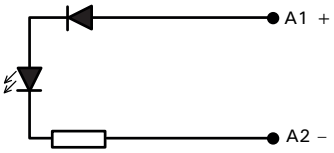
SRD SGR2 M03

- 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)



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CH - 7310 Bad Ragaz, Switzerland
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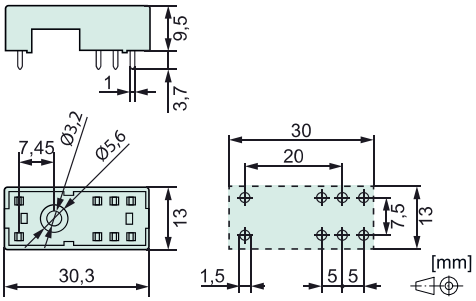
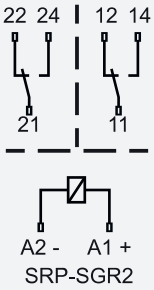
PCB socket
SRP SGR2
for SGR282 ZK

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	4000 V_{rms} / 1 min
Creepage resistance	CTI 250
Pollution degree	2
Overvoltage category	III

Mechanical data
Weight	approx. 4 g

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

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CH - 7310 Bad Ragaz, Switzerland
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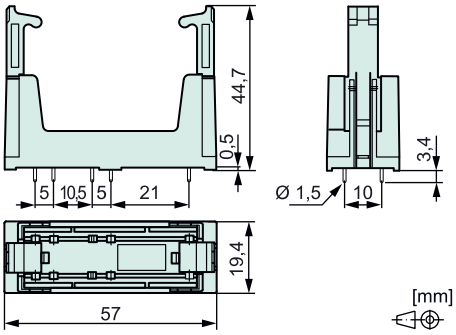
PCB socket
SRP SIR4
for SIR4

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

Dimensions

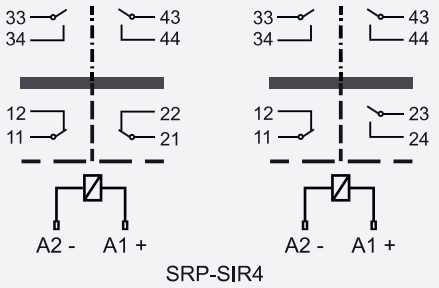


Technical data

Limit continuous current*	8 A
Rated voltage	250 VAC

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

Circuit diagram (top view)



SRP-SIR4

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

Other data

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

Mounting instructions

Mounting	on PCB

Product key

SRP SIR4

SRP	Socket type	PCB socket
SIR4	Relay series	SIR4

Options, Accessories

none available

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CH - 7310 Bad Ragaz, Switzerland
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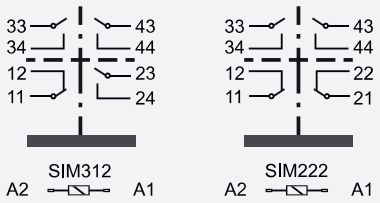
PCB socket
SRP SIM4
for SIM3 and SIM4

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

Circuit diagram (top view)

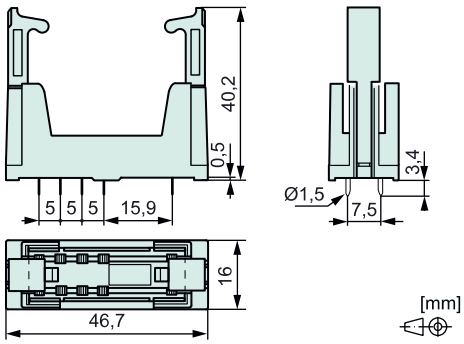


Insulation data

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
Creepage resistance	CTI 250
Pollution degree	2
Overvoltage category	III

Options, Accessories
none available

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

Technical data

Limit continuous current*	8 A
Rated voltage	250 VAC

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

Product key

SRP SIM4

SRP	Socket type	PCB socket
SGR2	Relay series	SIR4

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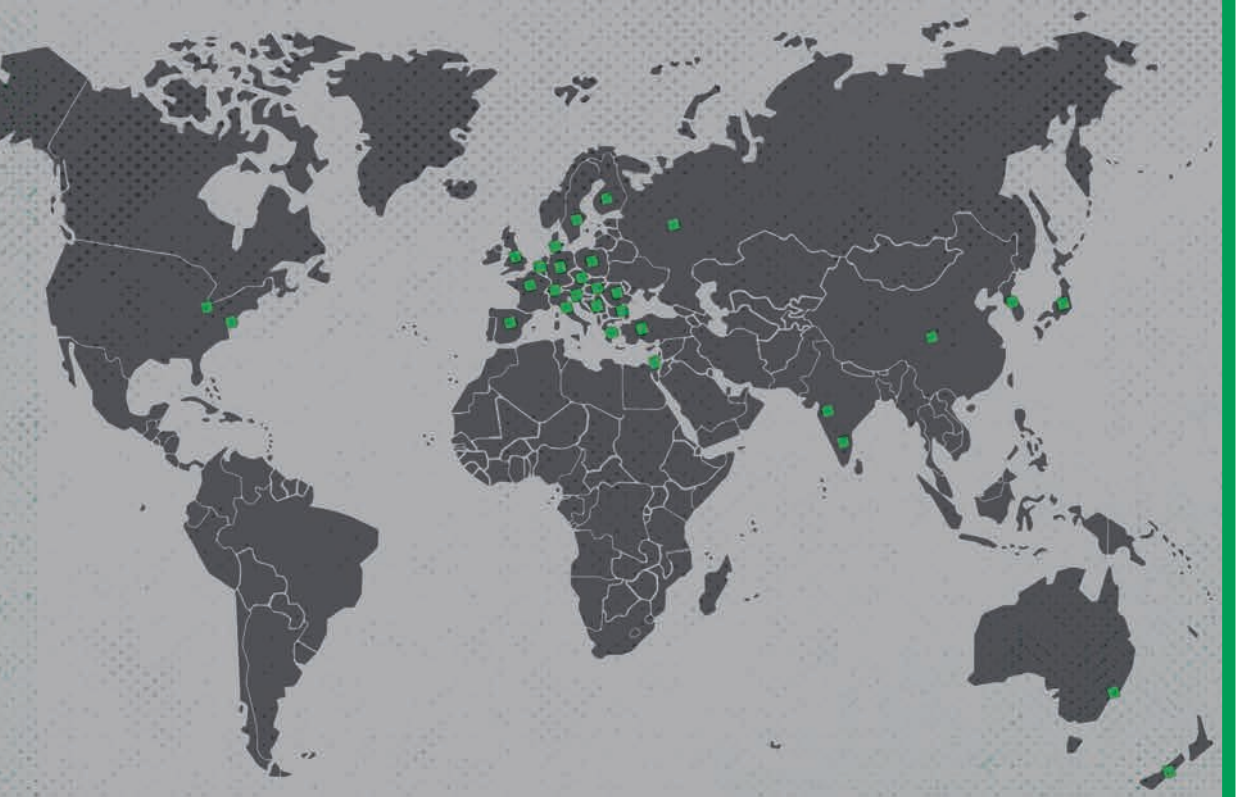

Switzerland:	ELESTA GmbH Heuteilstrasse 18 CH-7310 Bad Ragaz Switzerland	Phone: eMail: Internet:	+41 81 303 54 00 admin@elesta-gmbh.com www.elesta-gmbh.com
Germany:	ELESTA GmbH Vertriebsbüro Leipzig Unterer Haselberg 32 D-04683 Naunhof	Phone: eMail:	+49 34293 47 38 18 m.meyer@elesta-gmbh.com
	ELESTA GmbH Vertriebsbüro Stuttgart Bergstrasse 16 D-71711 Steinheim an der Murr	Phone: eMail:	+49 7144 160 21 34 y.kihodu@elesta-gmbh.com
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HEUTEILSTRASSE 18, CH-7310 SWITZERLAND