RSLS

1-pole, Slim Plug-in/PCB mount solid state relays

Description

The **RSLS** is a plug-in/pcb mount solid state relay series with an ultra slim width of 5mm ideally suited for compact spaces in control cabinets and for high density PCB applications.

AC and DC output switching options are available. The AC switching version is available in zero cross switching mode or instant on (random) switching. The output of the **RSLS** is controlled with a DC voltage.

Factory assembled options with the RSLS fittted on DIN sockets are available. The **RSLS..IN.** is a DIN socket assembly with screw terminals whereas the **RSLS..IG.** is a DIN socket assembly with spring terminals. The relays are held in place or released by a lever mechanism that prevents disconnection of the socket wiring during maintenance. The **RSLS..IN., RSLS..IG.** have a LED indicator for easy identification of the control status.

Specifications are at a surrounding temperature of 25°C unless otherwise specified.

Main features

Solid state relays

- Ultra slim 5mm wide solid state relays
- Normally open, AC or DC output
- Wear-free, long service life
- Fast switching response for precise control
- Resistant to vibration and shock
- Suitable for PCB mounting or for fitting to DIN sockets
- Wide operating temperature range

Solid state relays pre-assembled on DIN sockets

- 6.2mm wide ready to use assembly (SSR + socket)
- Suitable for standard 35 mm DIN rails
- Screw or spring terminals
- Lever for easy locking and removal of the relay
- LED input status indicator

Applications

Electronic circuit boards, Programmable controllers, Industrial control panels, Labelling machines, Packaging machines, Vending machines, Light signal controls, Valves and solenoids, Manufacturing equipment, Test equipment

Main functions

- AC output switching, zero cross or random (instant on), up to 2 A, 280 VAC
- DC output switching, up to 3.5 A or 6 A, 24 VDC and up to 100 mA, 48 VDC
- DC control voltage: 3-12 VDC or 15-30 VDC
- High switching frequency for RSLSD..
- Overvoltage protection for RSLSD..

Order code

RSLS □□□□□

Enter the code option instead of □. Refer to the Selection guide section for valid part numbers.

Code	Option	Description	Comments
RSLS	-	Solid state relay (plug-in / PCB mount) with AC or DC switching	
□	A	AC switching (zero cross switching)	
	B	AC switching (random switching)	
	D	DC switching	
□	024	Rated output voltage: 24 VDC (3 - 30 VDC)	
	048	Rated output voltage: 48 VDC (1 - 48 VDC)	
	230	Rated output voltage: 230 VAC (12 - 280 VAC)	24 - 280 VAC for RSLSA..
□	M	Control voltage: 5 VDC (3 - 12 VDC)	
	D	Control voltage: 24 VDC (15 - 30 VDC)	
□	020	Max. rated current: 2 AAC	Applicable with RSLS..230..
	001	Max. rated current: 100 mADC	Applicable with RSLSD048..
	035	Max. rated current: 3.5 ADC	Applicable with RSLSD024..
	060	Max. rated current: 6 ADC	Applicable with RSLSD024..
□	IG1	Pre-assembled in spring terminal socket, 6-24 VDC input	
	IN1	Pre-assembled in screw terminal socket, 6-24 VDC input	

Selection guide

Output voltage	Control voltage	Rated operational current @ 40°C			
		2 AAC	100 mADC	3.5 ADC	6 ADC
24 VDC	3 - 12 VDC	-	-	RSLSD024M035	RSLSD024M060
	15 - 30 VDC	-	-	RSLSD024D035	RSLSD024D060
48 VDC	3 - 12 VDC	-	RSLSD048M001	-	-
	15 - 30 VDC	-	RSLSD048D001	-	-
230 VAC (zero-cross)	3 - 12 VDC	RSLSA230M020	-	-	-
	15 - 30 VDC	RSLSA230D020	-	-	-
230 VAC (random)	3 - 12 VDC	RSLSB230M020	-	-	-
	15 - 30 VDC	RSLSB230D020	-	-	-

Selection guide - pre-assembled on RSLDIN sockets

Output voltage	Control voltage	Rated operational current @ 40°C			
		2 AAC	100 mADC	3.5 ADC	6 ADC
24 VDC	6 - 12 VDC	-	-	RSLSD024M035IG1	RSLSD024M060IG1
		-	-	RSLSD024M035IN1	RSLSD024M060IN1
	15 - 24 VDC	-	-	RSLSD024D035IG1	RSLSD024D060IG1
		-	-	RSLSD024D035IN1	RSLSD024D060IN1
48 VDC	6 - 12 VDC	-	RSLSD048M001IG1	-	-
		-	RSLSD048M001IN1	-	-
	15 - 24 VDC	-	RSLSD048D001IG1	-	-
		-	RSLSD048D001IN1	-	-
230 VAC (zero-cross)	6 - 12 VDC	RSLSA230M020IG1	-	-	-
		RSLSA230M020IN1	-	-	-
	15 - 24 VDC	RSLSA230D020IG1	-	-	-
		RSLSA230D020IN1	-	-	-
230 VAC (random)	6 - 12 VDC	RSLSB230M020IG1	-	-	-
		RSLSB230M020IN1	-	-	-
	15 - 24 VDC	RSLSB230D020IG1	-	-	-
		RSLSB230D020IN1	-	-	-

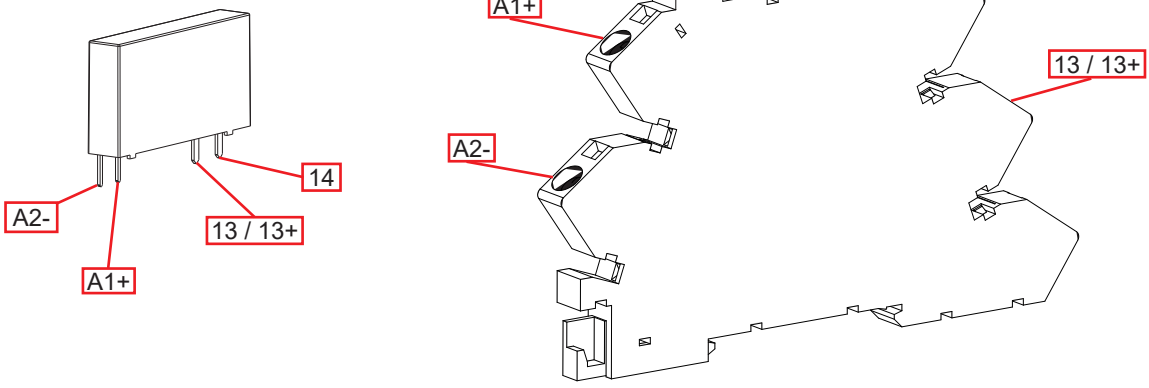
Carlo Gavazzi compatible components

Description	Component code	Notes
DIN socket	RSLDIN-1GAX10	Spring loaded terminal (pack of 10)
	RSLDIN-1NAX10	Screw terminal (pack of 10)

Carlo Gavazzi further reading

Information	Where to find it	Notes
Datasheet	https://www.gavazziautomation.com/fileadmin/images/PIM/DATASHEET/ENG/SSR_Accessories.pdf	Solid state relay Accessories
Installation manual	https://www.gavazziautomation.com/fileadmin/images/PIM/MANUALS/ENG/SSR_IL_RSLS.pdf	RSLS Installation manual

Structure



Element	Component	Function
13/13+	Power connection	Line output terminal (13 for RSLSA/B..) / +ve output terminal (13+ for RSLSD..)
14	Power connection	Load output terminal (RSLSA/B..) / Ground output terminal (RSLSD..)
A1+, A2-	Control connection	Terminals for control voltage
LED	ON indicator	Indicates presence of control voltage
SSR	Solid state relay	Plug-in or PCB mount SSR
Socket	DIN socket	DIN rail mounting

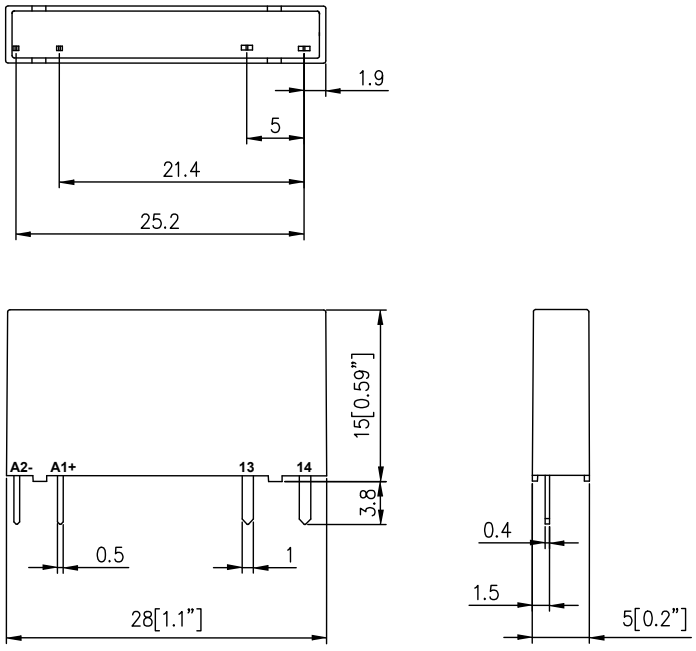
Features

General data

Material	PA66 (UL94 V0), black	
Potting compound	Halogen-free polyurethane based resin (UL 94 V0)	
Touch protection	RSLS.. RSLS..IG1 / RSLS..IN1	IP00 IP20
Overvoltage category	III	
Packaging	10 pcs. per box Weight per box: RSLS RSLS..IG1 / RSLS..IN1	 approx 63 g approx 324 g
Weight	RSLS.. RSLS..IG1 / RSLS..IN1	approx. 6.3 g approx. 32.4 g
Isolation	Input to output:	2500 VACrms 3750 VACrms (applicable only to RLSD048..)

Dimensions

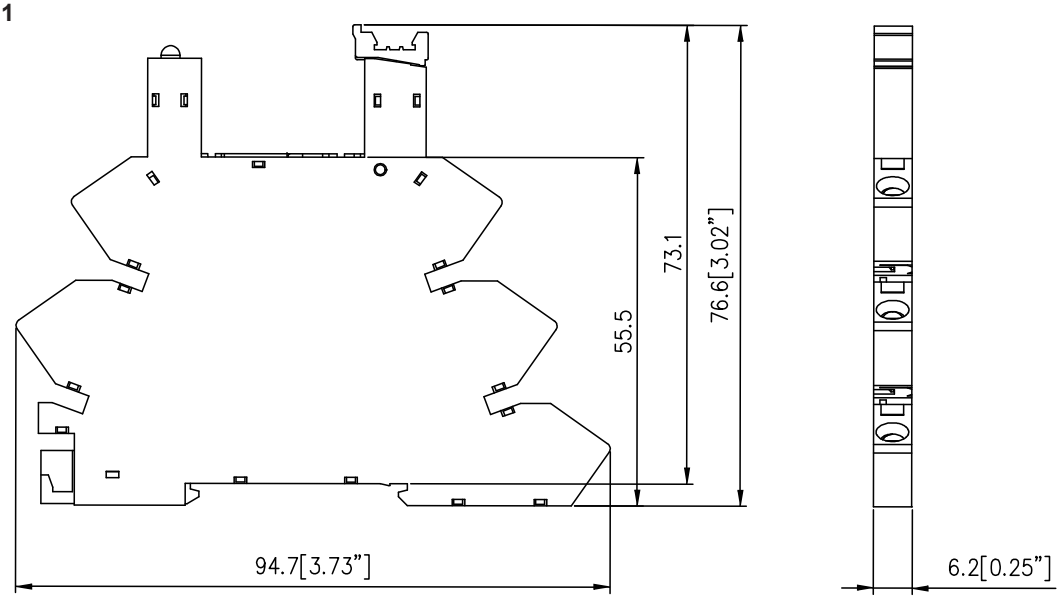
RSLS..



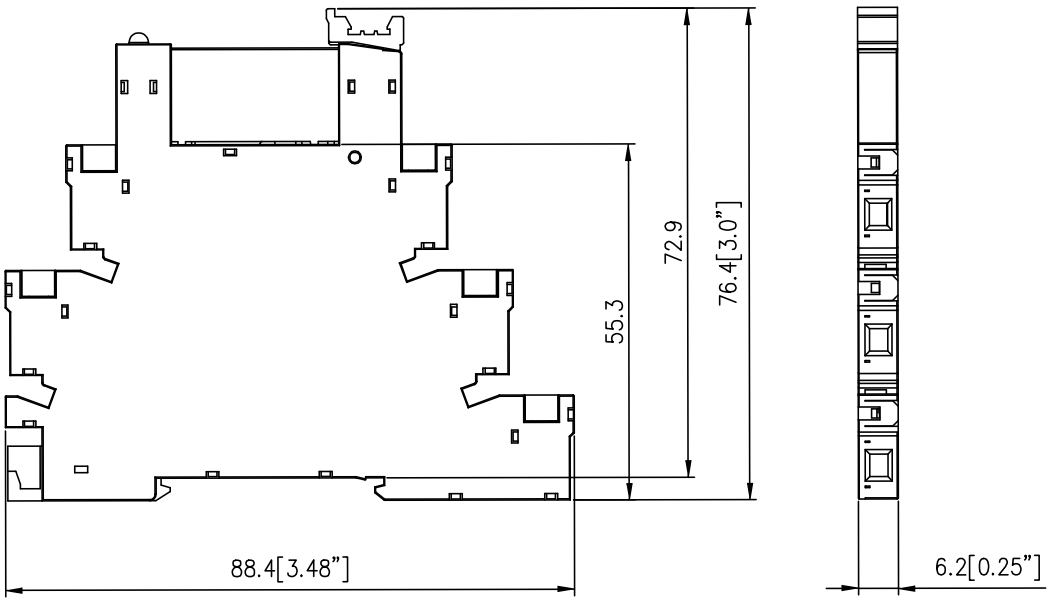
Dimensions in mm unless otherwise noted.

Dimensions (continued)

RSLS..IG1



RSLS..IN1



Dimensions in mm unless otherwise noted.

Performance

Output voltage specifications

	RSLSD024..	RSLSD048..	RSLSA230..	RSLSB230..
Operational voltage range	3 - 30 VDC	1 - 48 VDC	24 - 280 VAC	12 - 280 VAC
Blocking voltage	33 VDC	60 VDC	600 Vp	600 Vp
Operational frequency range	-	-	45 - 65 Hz	45 - 65 Hz

Output specifications - RSLSD..

	RSLSD024.035	RSLSD024.060	RSLSD048.001
Max. operational current[1]: DC-12 / LCN	3.5 ADC	6 ADC	100 mADC
Minimum operational current	1 mADC		
Off-State leakage current @ rated voltage	0.1 µA		0.01 µA
On-state voltage drop @ rated current	0.5 Vp	0.5 Vp	1 Vp
Non-repetitive surge current (I_{TSM}), t=15 ms	30 Ap	60 Ap	0.3 Ap
Switch configuration	N.O.	N.O.	N.O.

Output specifications - RSLSA/B..

	RSLSA230.020 RSLSB230.020
Max. operational current[1]: AC-51 / LCA	2 AAC
Minimum operational current	20 mAAC
Off-State leakage current @ rated voltage	1 mA
Min. off-state dv/dt @ max. rated voltage	500 V/µs
I^2t for fusing (t=0.5 cycle), 50/60 Hz	32/29 A^2s
On-state voltage drop @ rated current	<1.5 Vp
Non-repetitive surge current (I_{TSM}), t=10 ms	80 Ap
Switch configuration	N.O.

1. refer to Current derating curves

Input specifications

	RSLS..M..	RSLS..D..	RSLS..M..IG1/IN1	RSLS..D..IG1/IN1
Control voltage range	3 - 12 VDC	15 - 30 VDC	6 - 12 VDC	15 - 24 VDC
Pick-up voltage	3 VDC	15 VDC	6 VDC	15 VDC
Drop-out voltage **RSLSD024..** **RSLSD048..** **RSLSA/B230..**	 1 VDC 1 VDC 1 VDC	 10 VDC 9 VDC 5.5 VDC	 1 VDC 1 VDC 1 VDC	 10 VDC 9 VDC 5.5 VDC
Input current **RSLSD024..** **RSLSD048..** **RSLSA/B230..**	 9 mA @ 5 VDC 4.1 mA @ 5 VDC 8 mA @ 5 VDC	 7.1 mA @ 24 VDC 5.2 mA @ 24 VDC 5.7 mA @ 24 VDC	 9.7 mA @ 6 VDC 4.8 mA @ 6 VDC 8.7 mA @ 6 VDC	 11 mA @ 24 VDC 9.1 mA @ 24 VDC 9.6 mA @ 24 VDC
Input impedance **RSLSD024..** **RSLSD048..** **RSLSA/B230..**	 0.51 kΩ 1.2 kΩ 0.62 kΩ	 3.4 kΩ 4.6 kΩ 4.2 kΩ	 0.62 kΩ 1.25 kΩ 0.7 kΩ	 2.18 kΩ 2.6 kΩ 2.5 kΩ
Max. switching frequency [2]	500 Hz			
Maximum response time, t_{ON} **RSLSD024..** **RSLSD048..** **RSLSA230..** **RSLSB230..**	 0.12 ms 0.1 ms 0.5 cycle 0.1 ms			
Maximum response time, t_{OFF} **RSLSD024..** **RSLSD048..** **RSLSA230..** **RSLSB230..**	 0.19 ms 0.27 ms 0.5 cycle 0.5 cycle			

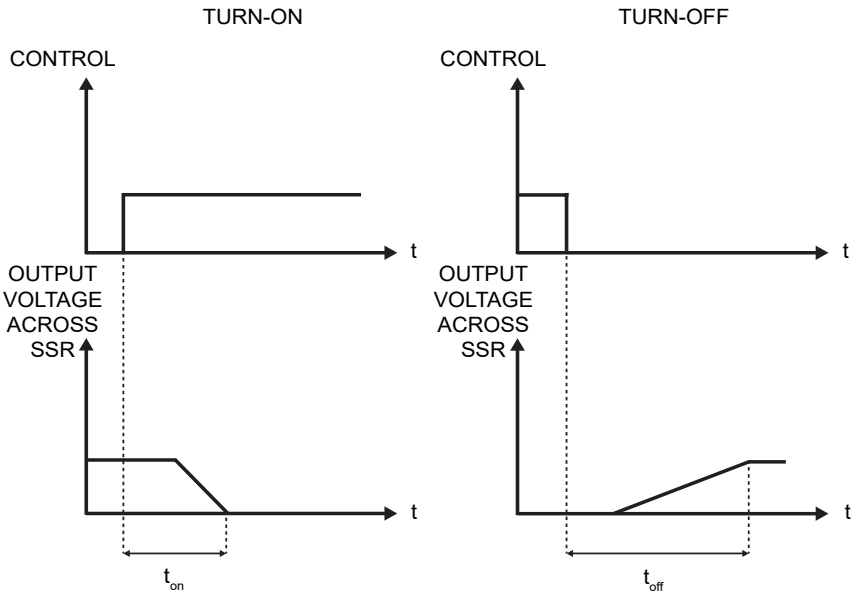
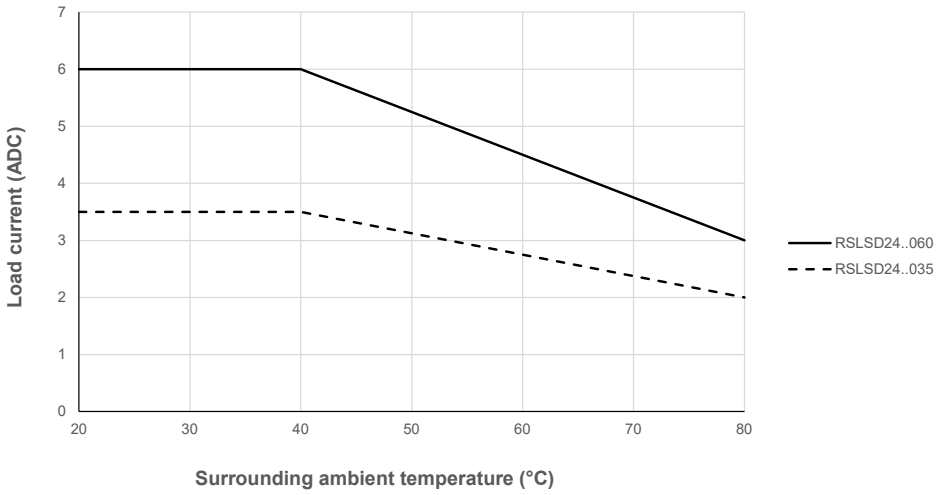


Fig 1: Response time characteristics

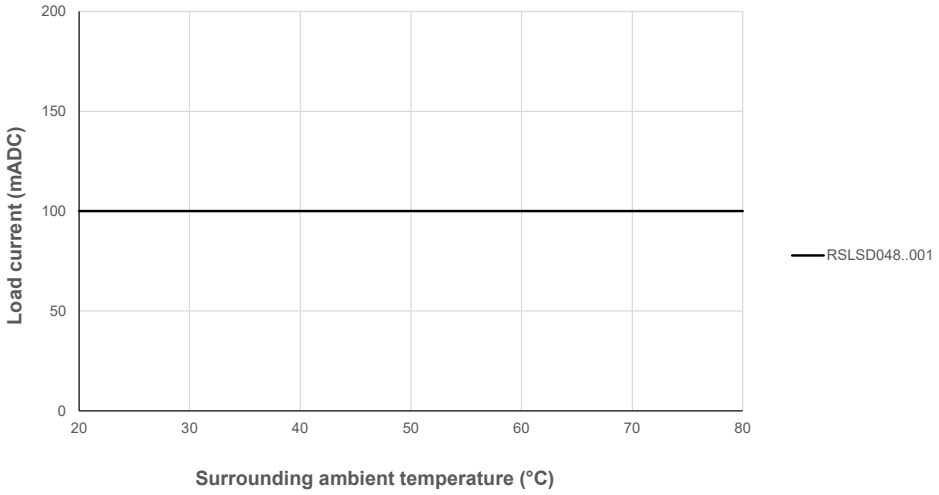
2. Applicable only to DC output versions (RSLSD..) Output current has to be derated at high switching frequencies. Refer to the Derating vs.PWM curves section.

Current derating

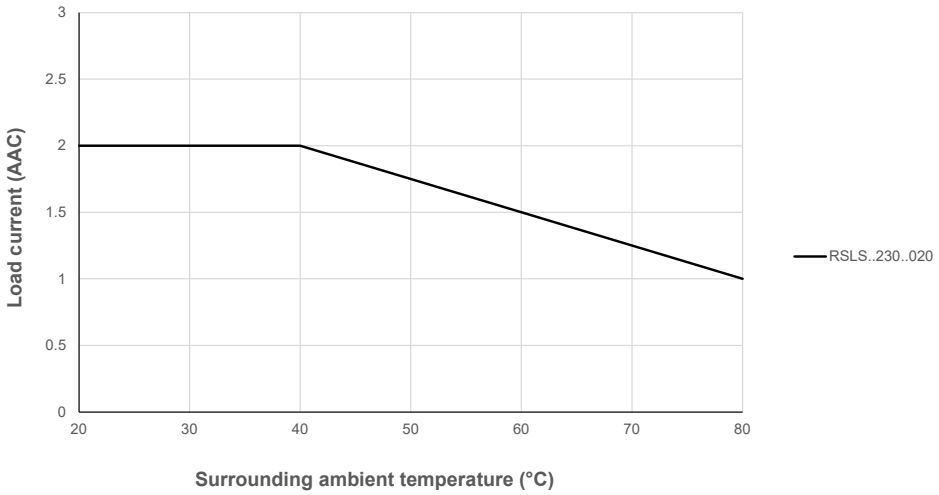
RSLSD024..



RSLSD048..

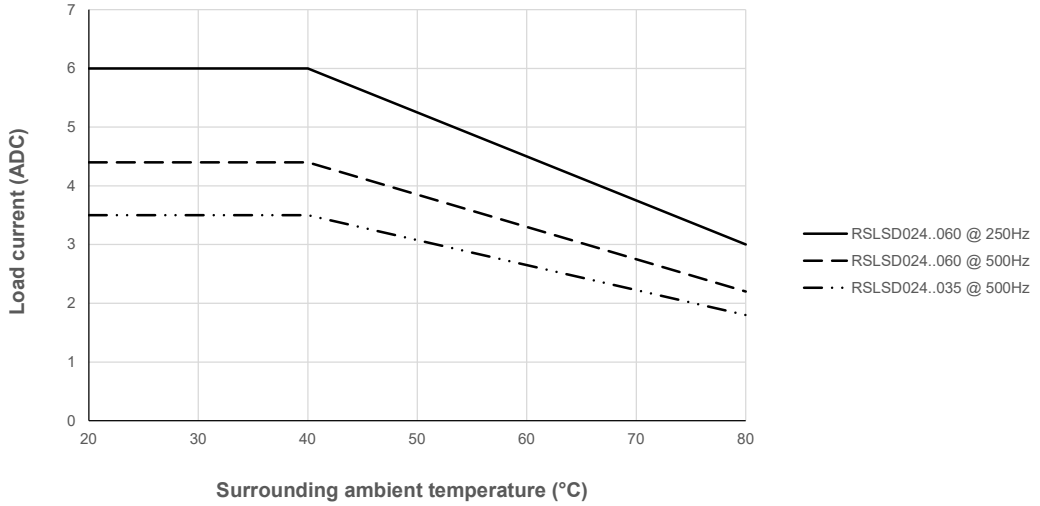


RSLS..230..

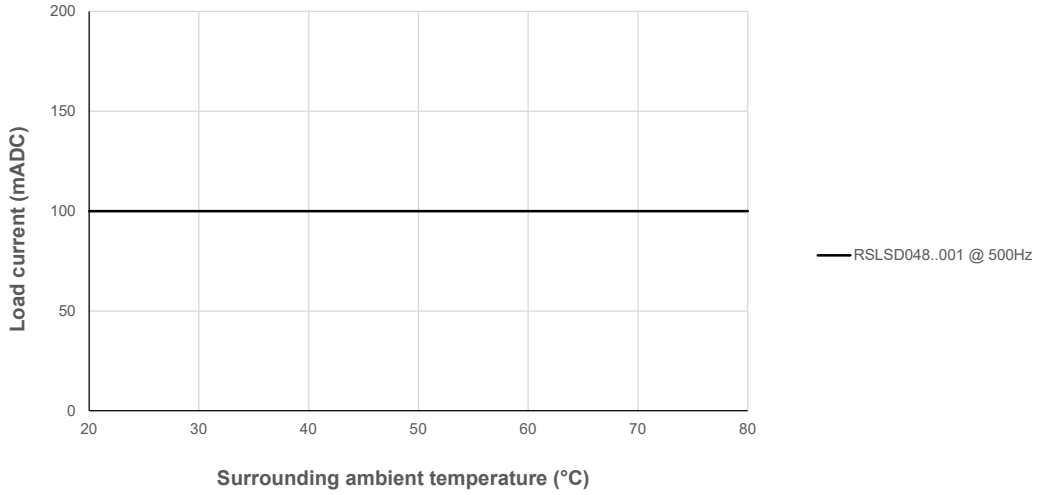


Derating vs. PWM curves

RSLSD024..

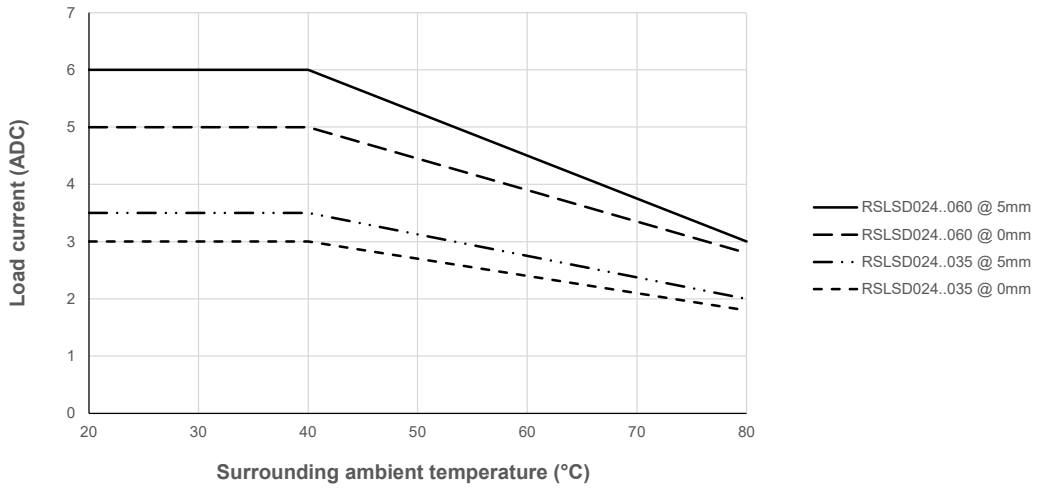


RSLSD048..

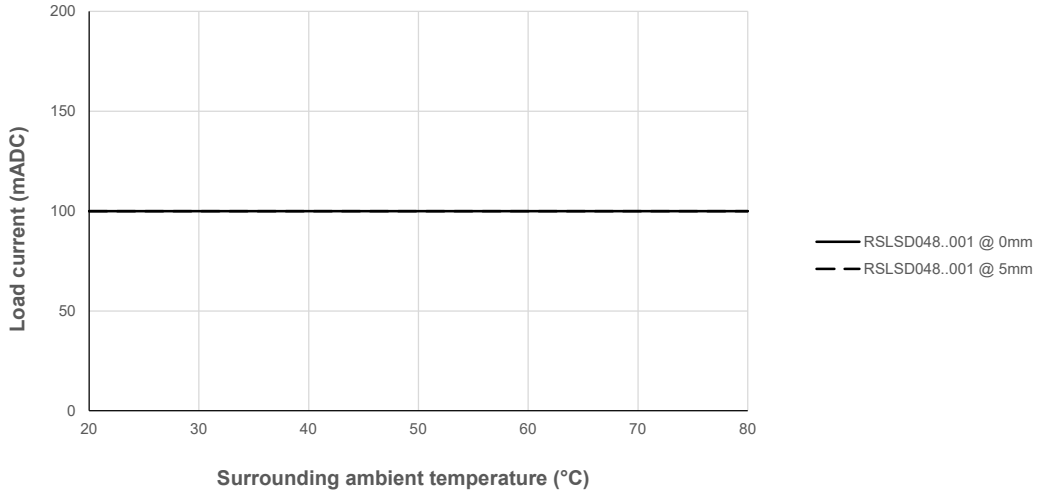


Derating vs. spacing curves

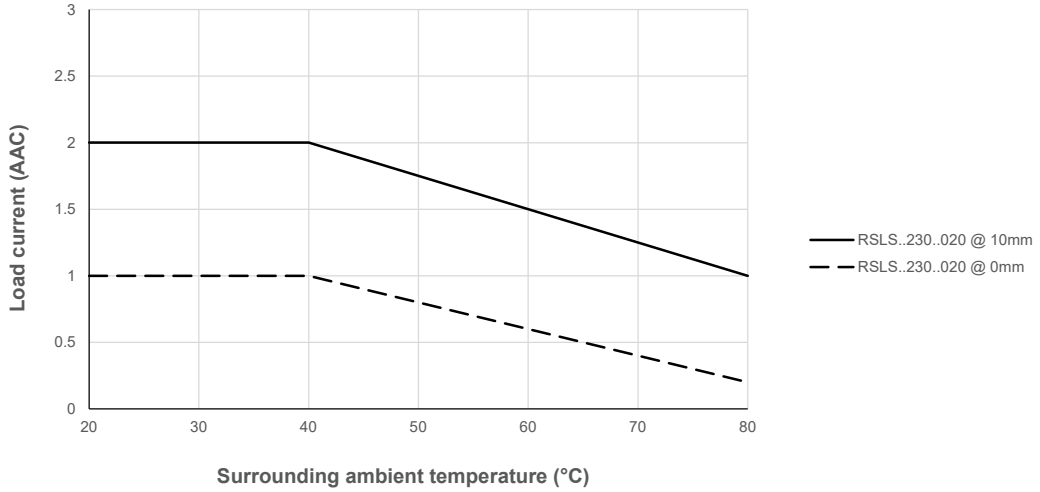
RSLSD024..



RSLSD048..



RSLS..230..



Compatibility and conformance

Approvals	
Standards compliance	LVD: EN 60947-4-3 (RSLSA/B..) EN 60947-5-1 (RSLSD..) EMCD: EN 60947-4-3 (RSLSA/B..) EN 60947-1 (RSLSD..) cURus: UL508 Recognised (E80573), NRNT2, NRNT8 CSA: C22.2 No. 14 (204075)

Electromagnetic compatibility (EMC) - Immunity	
Electrostatic discharge (ESD)	EN/IEC 61000-4-2 8 kV air discharge, 4 kV contact (PC1)
Radiated radio frequency	EN/IEC 61000-4-3 10 V/m, from 80 MHz to 1000 MHz (PC1) 3 V/m, from 1000 MHz to 6000 MHz (PC1)
Electrical fast transient (burst)	EN/IEC 61000-4-4 Output: 2 kV, 5 kHz (PC2) Input: 1 kV, 5 kHz (PC2)
Conducted radio frequency	EN/IEC 61000-4-6 10 V/m, from 0.15 to 80 MHz (PC1)
Electrical surge **RSLSA/B..** **RSLSD..** **RSLS..**	EN/IEC 61000-4-5 Line to earth: 2 kV (PC2) Line to line: 1 kV (PC2) Line to earth: 1 kV (PC2) Line to line: 0.5 kV (PC2) IEC 62314 Control to earth: 1 kV (PC2)[3]
Voltage dips	EN 61000-4-11 0% for 10 ms (PC2) 40% for 100 ms (PC2) 70% for 500 ms (PC2)
Voltage interruptions	EN/IEC 61000-4-11 0% for 5000 ms (PC2)

Electromagnetic compatibility (EMC) - Emissions	
Radio interference field emission (radiated)	EN 55011 Class A: from 30 to 1000 MHz
Radio interference voltage emissions (conducted)	EN 55011 Class A: from 0.15 to 30 MHz

3. external protection is required across A1-A2 for IEC 62314. DC port <60V is exempted for IEC 60947

Environmental specifications

Operating temperature	-25°C to +80°C (-13°F to +176°F) max. +70°C (+158°F) for RSLS..IG./RSLS..IN.
Storage temperature	-25°C to +85°C (-13°F to +185°C)
Relative humidity	95% non-condensing @ 40°C
Pollution degree	2
Installation altitude	0-1000 m. Above 1000 m derate linearly by 1% of FLC per 100 m up to a maximum of 2000 m
Vibration resistance	5g / axis (55 to 150Hz, IEC/EN 60068-2-6)
Impact resistance	15/11 g/ms (IEC/EN 60068-2-27)
EU RoHS compliant	Yes
China RoHS	

The declaration in this section is prepared in compliance with People's Republic of China Electronic Industry Standard SJ/T11364-2014: Marking for the Restricted Use of Hazardous Substances in Electronic and Electrical Products.

Part Name	**Toxic or Harardous Substances and Elements**					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr(VI))	Polybrominated biphenyls (PBB)	Polybrominated diphenyl ethers (PBDE)
Power Unit Assembly	x	O	O	O	O	O

O: Indicates that said hazardous substance contained in homogeneous materials fot this part are below the limit requirement of GB/T 26572.

X: Indicates that said hazardous substance contained in one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.

这份申明根据中华人民共和国电子工业标准
SJ/T11364-2014：标注在电子电气产品中限定使用的有害物质

零件名称	有毒或有害物质与元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴化联苯 (PBB)	多溴联苯醚 (PBDE)
功率单元	x	O	O	O	O	O

O:此零件所有材料中含有的该有害物低于GB/T 26572的限定。

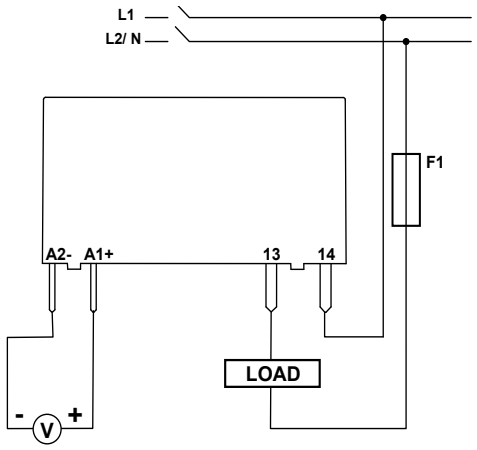
X: 此零件某种材料中含有的该有害物高于GB/T 26572的限定。

Short circuit protection

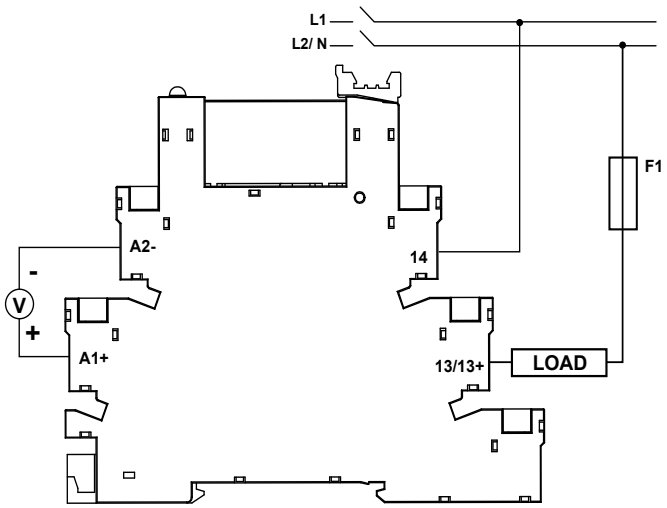
Part number	Protection Co-ordination	Prospective short circuit current	Max. fuse size, F1 [A]	Part number	Max. voltage
RSLSD024..	Type 1	100 ADC	tbd	tbd	tbd
RSLSD048..					
RSLSA230..	Type 2	5 kArms	2.5 AAC	0ADAC2500-BE (Bel Fuse)	280 VAC
RSLSB230..					

Connection diagram

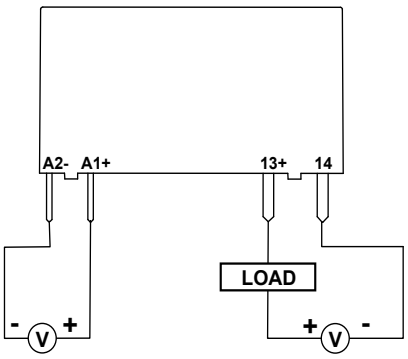
RSLSA..
RSLSB..



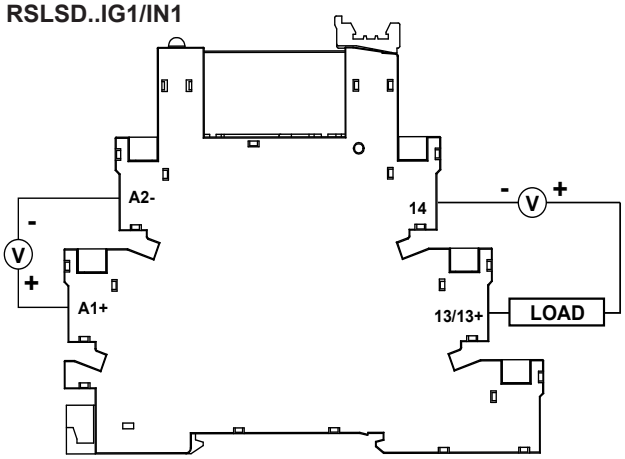
RSLSA..IG1/IN1
RSLSB..IG1/IN1



RSLSD..

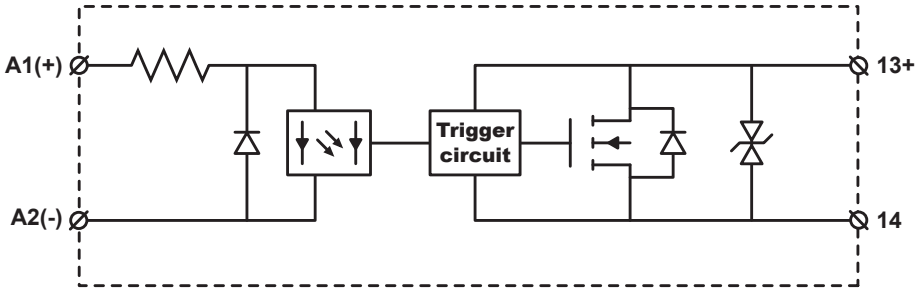


RSLSD..IG1/IN1

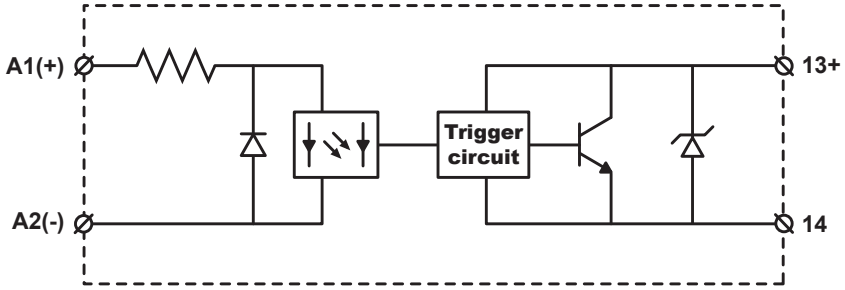


Functional diagram

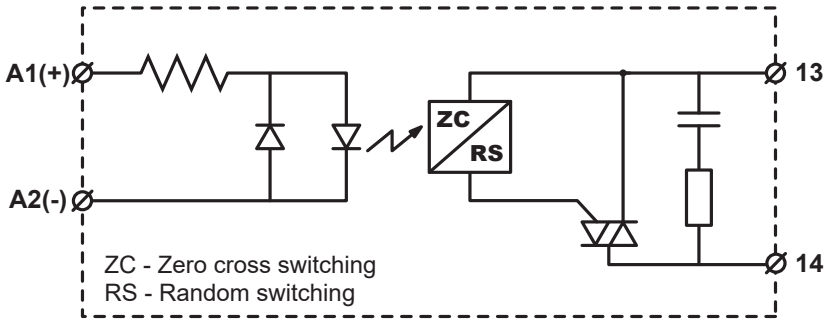
RSLSD024..



RSLSD048..

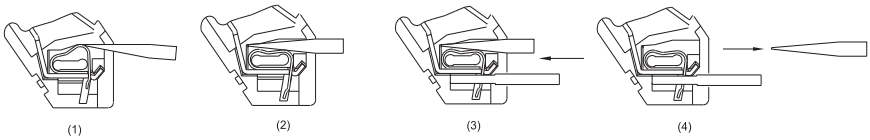


RSLSA/B230..



Connection Specifications

RSLS..	
Terminals	Copper, nickel-plated
Terminal soldering temperature	Max. 350°C for 10 seconds

RSLS..IG1	
Terminals	A1+, A2-, 13/13+, 14
Conductors	Use 75°C copper (Cu) conductors
	
Connection type	Spring-loaded terminal (2.5 mm flat-head bit to open terminal as shown below) 
Stripping length	7mm
Rigid (solid & stranded)	1x 0.5 - 2.5 mm² 1x 20 - 14 AWG
Rigid (stranded)	2x 0.5 - 1.5 mm² 2x 20 - 16 AWG
Torque specifications	-

RSLS..IN1	
Terminals	A1+, A2-, 13/13+, 14
Conductors	Use 75°C copper (Cu) conductors
	
Connection type	Screw terminals
Stripping length	7mm
Rigid (solid & stranded)	1x 0.5 - 2.5 mm² 1x 20 - 14 AWG
Rigid (stranded)	2x 0.5 - 1.5 mm² 2x 20 - 16 AWG
Torque specifications	Phillips screwdriver: 3.5 mm max. diameter Flat-head screwdriver: 3.5 mm max. diameter, 0.6 mm max. tip thickness 0.5 Nm (4.4 lb - in)