

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



### 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

### 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 fitted 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.

### 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	
<input type="checkbox"/>	A	AC switching (zero cross switching)	
	B	AC switching (random switching)	
	D	DC switching	
<input type="checkbox"/>	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 RLSA..
<input type="checkbox"/>	M	Control voltage: 5 VDC (3 - 12 VDC)	
	D	Control voltage: 24 VDC (15 - 30 VDC)	
<input type="checkbox"/>	020	Max. rated current: 2 AAC	Applicable with RSLSD0230..
	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..
<input type="checkbox"/>	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	RLSA230M020	-	-	-
	15 - 30 VDC	RLSA230D020	-	-	-
230 VAC (random)	3 - 12 VDC	RLSB230M020	-	-	-
	15 - 30 VDC	RLSB230D020	-	-	-

**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	RLSA230M020IG1	-	-	-
		RLSA230M020IN1	-	-	-
	15 - 24 VDC	RLSA230D020IG1	-	-	-
		RLSA230D020IN1	-	-	-
230 VAC (random)	6 - 12 VDC	RLSB230M020IG1	-	-	-
		RLSB230M020IN1	-	-	-
	15 - 24 VDC	RLSB230D020IG1	-	-	-
		RLSB230D020IN1	-	-	-

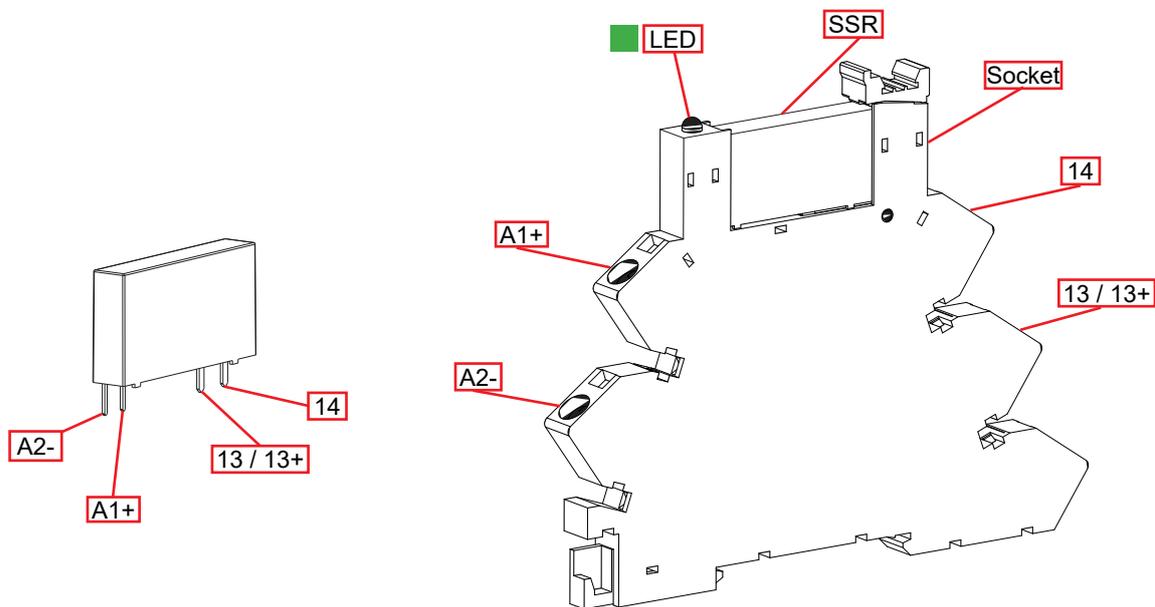
**Carlo Gavazzi compatible components**

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	<a href="https://www.gavazziautomation.com/fileadmin/images/PIM/DATASHEET/ENG/SSR_Accessories.pdf">https://www.gavazziautomation.com/fileadmin/images/PIM/DATASHEET/ENG/SSR_Accessories.pdf</a>	Solid state relay Accessories
Installation manual	<a href="https://www.gavazziautomation.com/fileadmin/images/PIM/MANUALS/ENG/SSR_IL_RSLs.pdf">https://www.gavazziautomation.com/fileadmin/images/PIM/MANUALS/ENG/SSR_IL_RSLs.pdf</a>	RSLs Installation manual

# Structure



Element	Component	Function
13/13+	Power connection	Line output terminal (13 for RLSA/B..) / +ve output terminal (13+ for RSLSD..)
14	Power connection	Load output terminal (RLSA/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

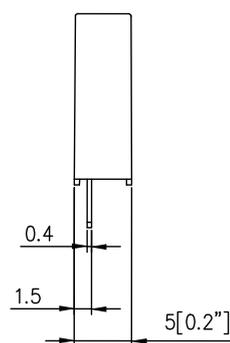
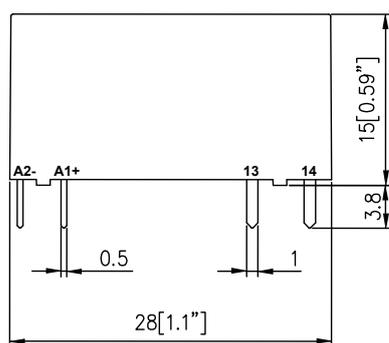
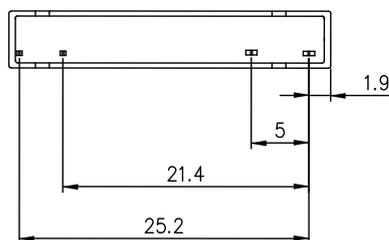
# Features

## General data

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

## Dimensions

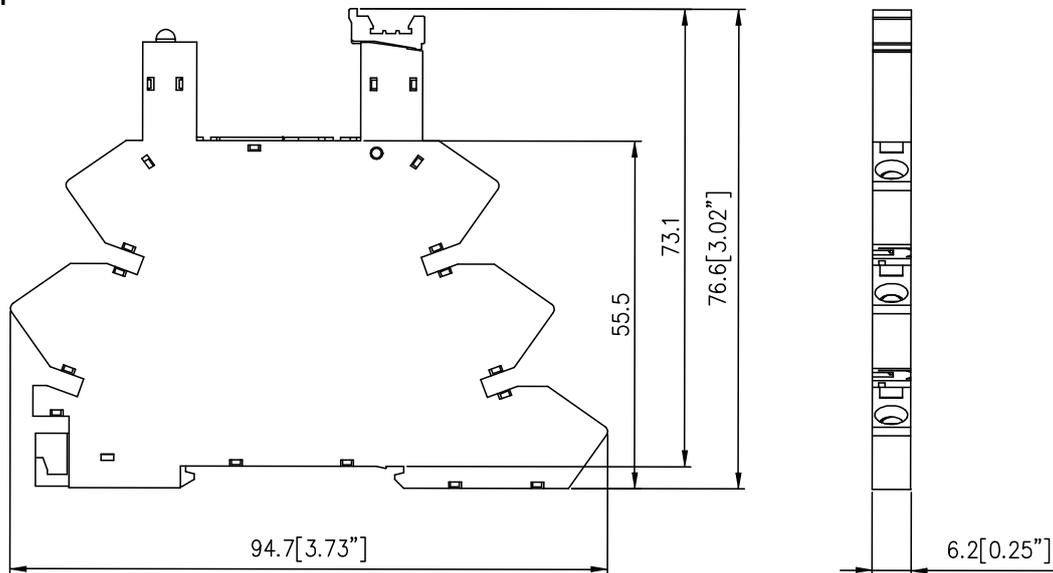
RSLs..



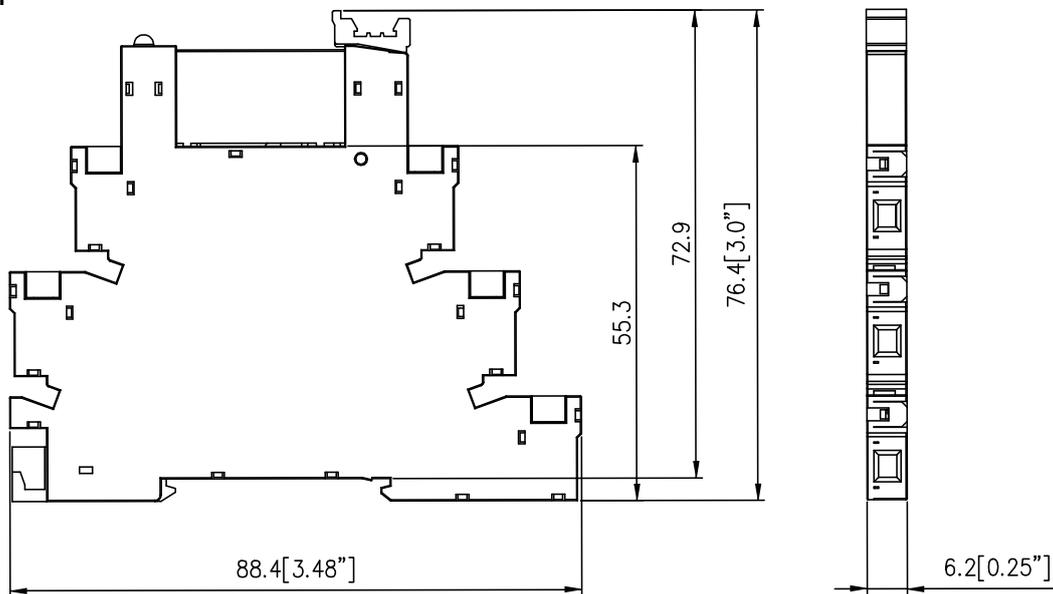
Dimensions in mm unless otherwise noted.

▶ Dimensions (continued)

RSLs..IG1



RSLs..IN1



Dimensions in mm unless otherwise noted.

## Performance

### Output voltage specifications

	RSLSD024..	RSLSD048..	RLSA230..	RLSB230..
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 <sup>1</sup> : DC-12 / LCN	3.5 ADC	6 ADC	100 mADC
Minimum operational current	1 mADC		
Off-State leakage current @ rated voltage	0.1 $\mu$ A		0.01 $\mu$ A
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.
Endurance testing for General Use (UL508)	100,000 cycles		

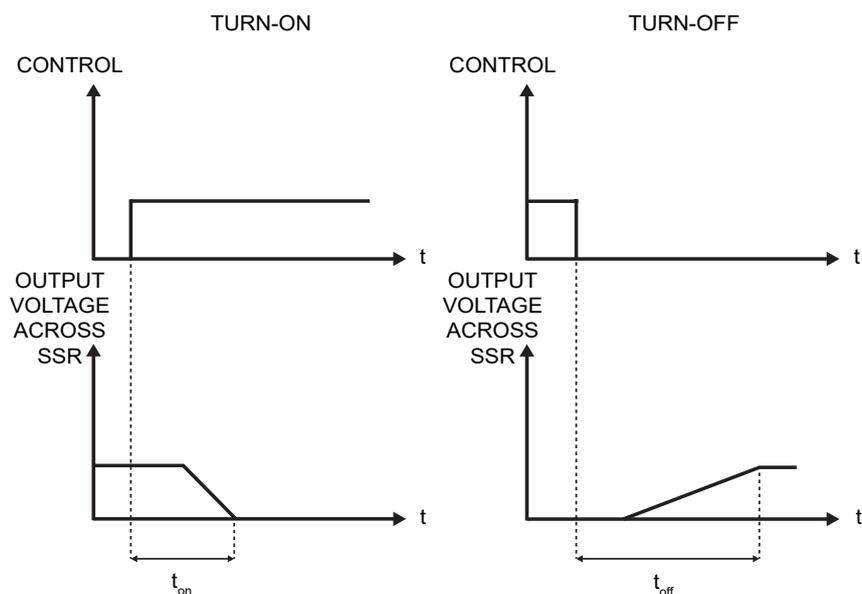
### Output specifications - RLSA/B..

	RLSA230.020 RLSB230.020
Max. operational current <sup>1</sup> : 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/ $\mu$ s
$I^2t$ for fusing ( $t=0.5$ cycle), 50/60 Hz	32/29 A <sup>2</sup> s
On-state voltage drop @ rated current	<1.5 Vp
Non-repetitive surge current ( $I_{TSM}$ ), $t=10$ ms	80 Ap
Switch configuration	N.O.
Endurance testing for General Use (UL508)	100,000 cycles

1. refer to Current derating curves

## Input specifications

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



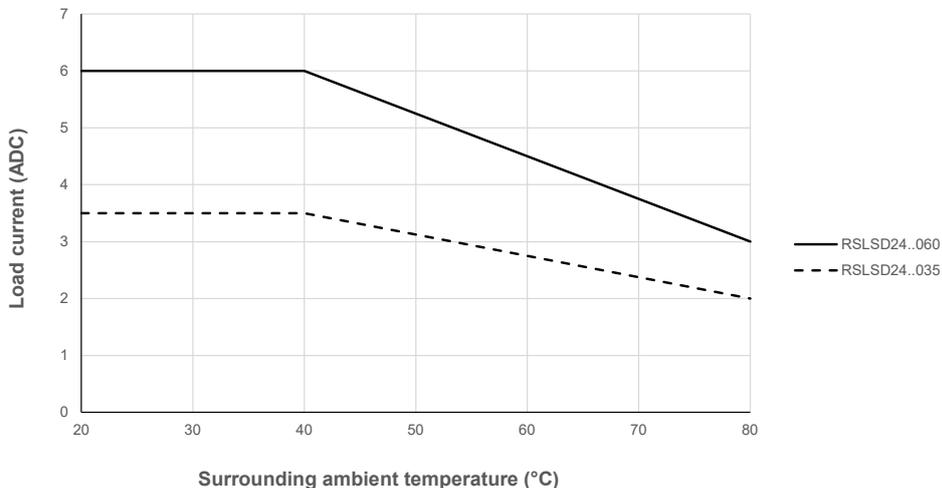
**Fig 1:** Response time characteristics

2. Control voltage range of 5 - 12 VDC is possible (with 5 VDC pick-up voltage), but not covered by UL certification

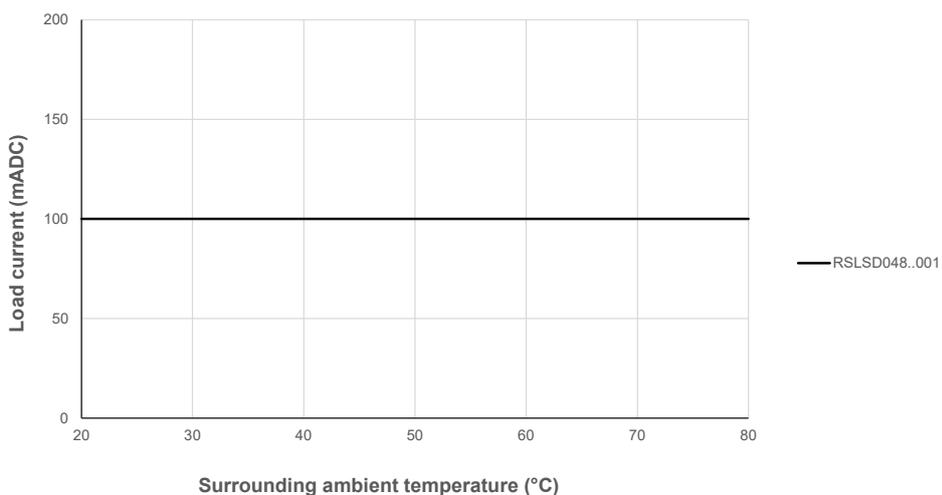
3. Applicable only to DC output versions (RSLSD..) Output current has to be derated at high switching frequencies. Refer to the Derating vs.PWM curves section.

**Current derating**

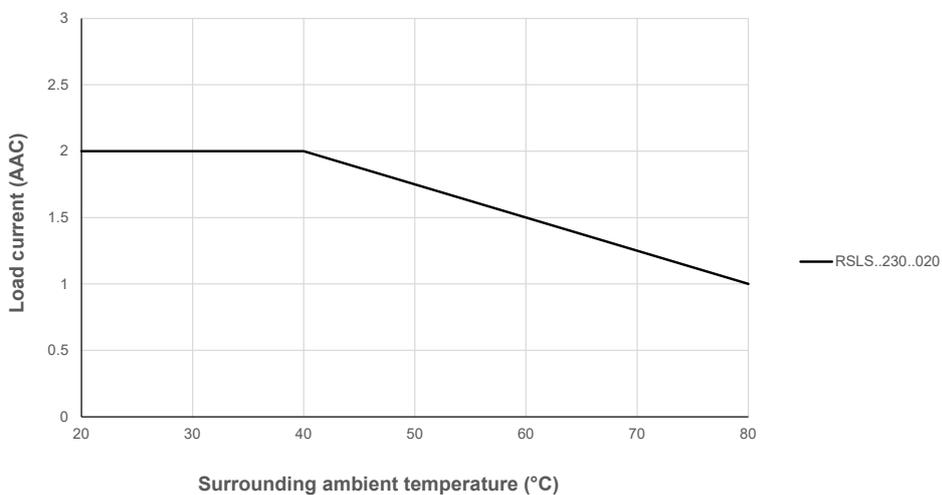
**RSLSD024..**



**RSLSD048..**

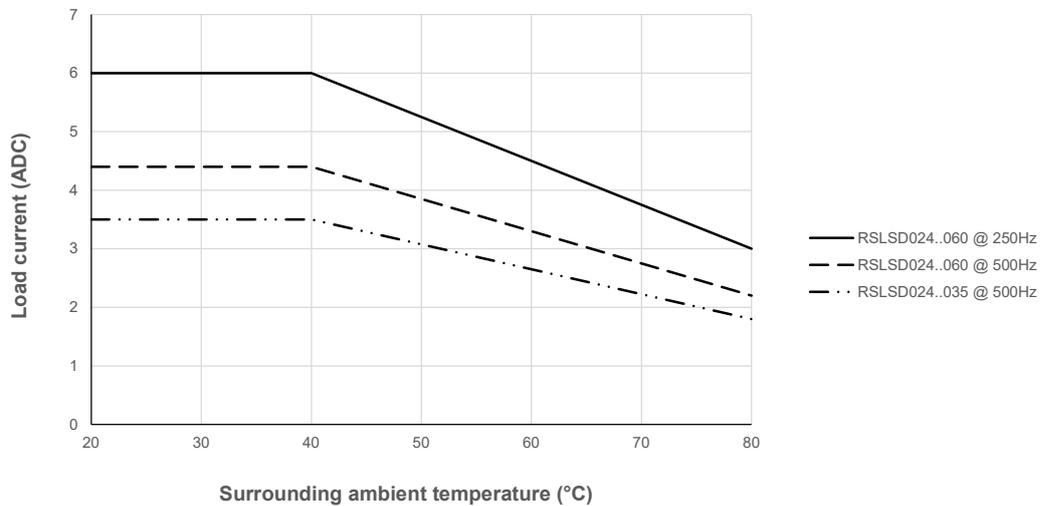


**RSLs..230..**

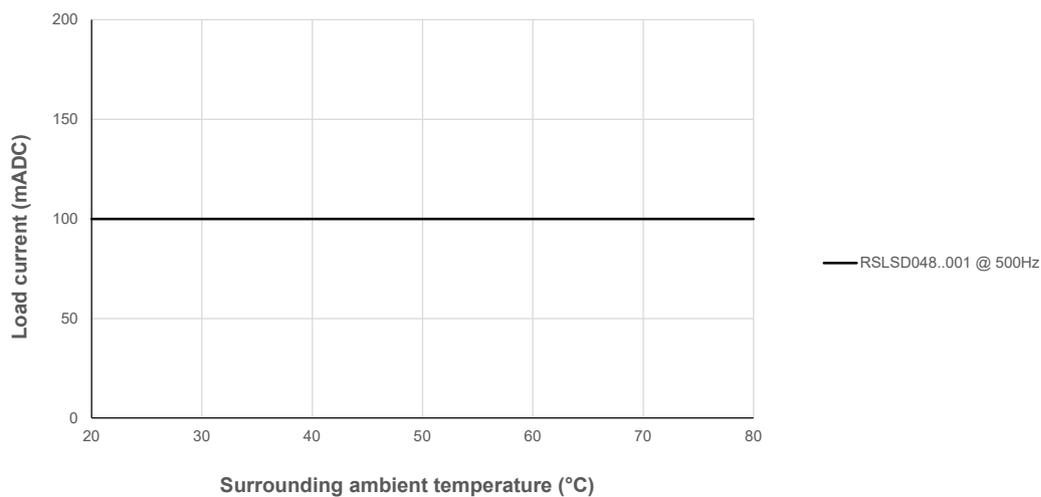


▶ Derating vs. PWM curves

RSLSD024..

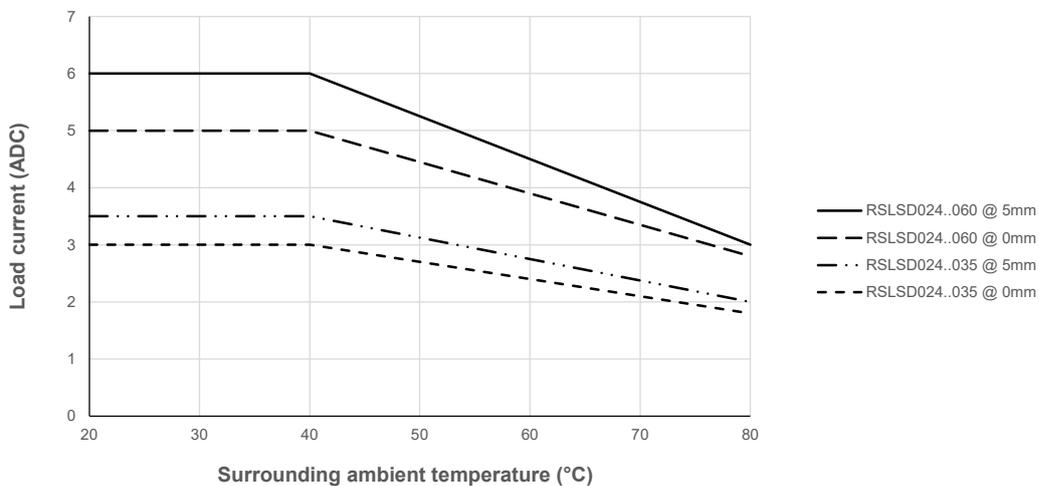


RSLSD048..

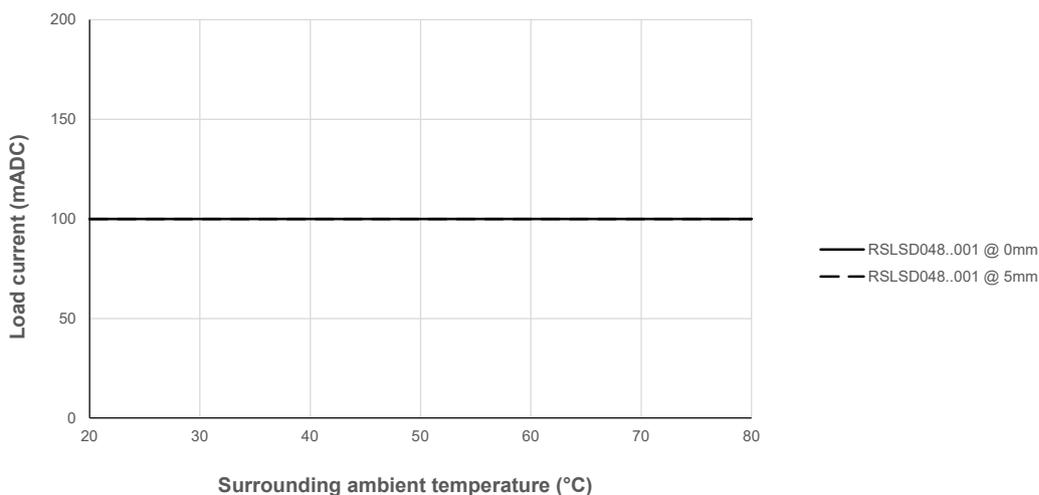


Derating vs. spacing curves

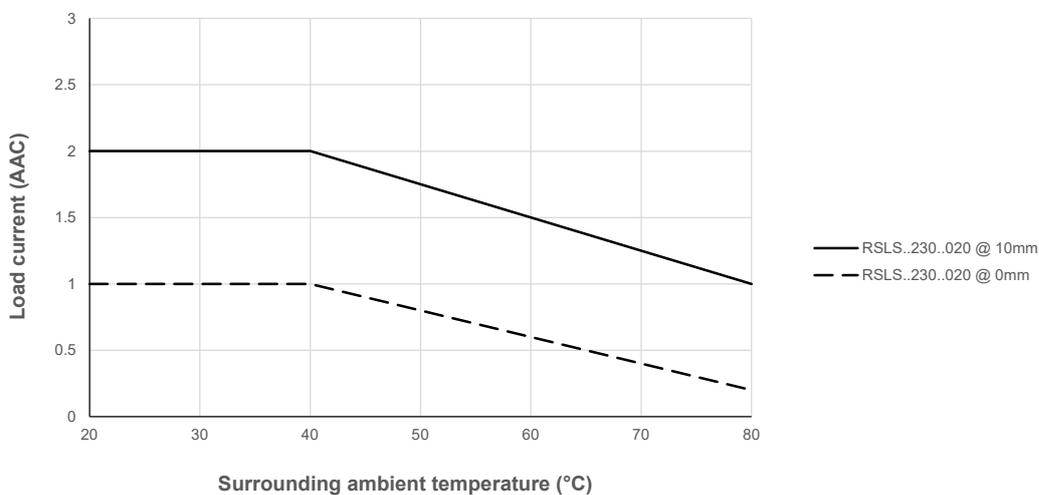
RSLSD024..



RSLSD048..



RSLs..230..



## Compatibility and conformance

<b>Approvals</b>	
<b>Standards compliance</b>	<p>LVD: EN 60947-4-3 (RLSA/B..) EN 60947-5-1 (RSLSD..)</p> <p>EMCD: EN 60947-4-3 (RLSA/B..) EN 60947-1 (RSLSD..)</p> <p>cURus: UL508 Recognized (E80573), NRNT2, NRNT8</p> <p>CSA: C22.2 No. 14 (204075)</p>

Electromagnetic compatibility (EMC) - Immunity	
<b>Electrostatic discharge (ESD)</b>	EN/IEC 61000-4-2 8 kV air discharge, 4 kV contact (PC1)
<b>Radiated radio frequency</b>	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)
<b>Electrical fast transient (burst)</b>	EN/IEC 61000-4-4 Output: 2 kV, 5 kHz (PC2) Input: 1 kV, 5 kHz (PC2)
<b>Conducted radio frequency</b>	EN/IEC 61000-4-6 10 V/m, from 0.15 to 80 MHz (PC1)
<b>Electrical surge</b>	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) <sup>4</sup>
<b>Voltage dips</b>	EN 61000-4-11 0% for 10 ms (PC2) 40% for 100 ms (PC2) 70% for 500 ms (PC2)
<b>Voltage interruptions</b>	EN/IEC 61000-4-11 0% for 5000 ms (PC2)

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

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

**Environmental specifications**

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

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))	Polybrominat-ed biphenyls (PBB)	Polybromi-nated diphenyl ethers (PBDE)
<b>Power Unit Assembly</b>	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)
<b>功率单元</b>	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。

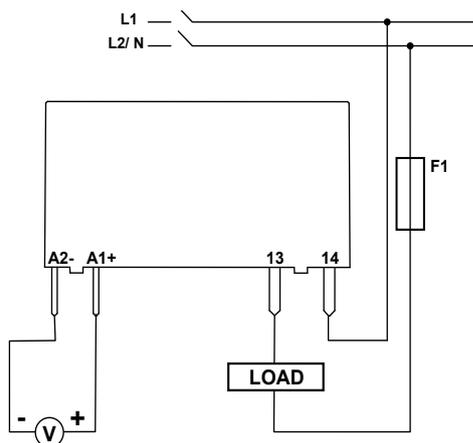
X: 此零件某种材料中含有的该有害物高于GB/T 26572的限定。

## Short circuit protection

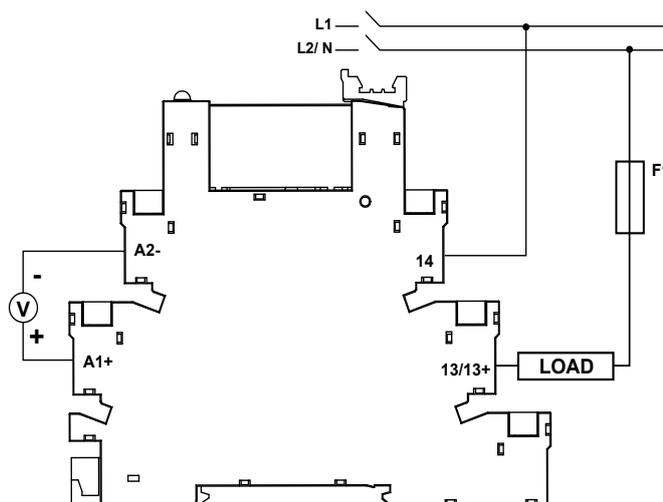
Part number	Protection Co-ordination	Prospective short circuit current	Max. fuse size, F1 [A]	Part number	Max. voltage
RSLSD024..	Type 1	100 ADC	tbd	tbd	tbd
RSLSD048..					
RLSA230..	Type 2	5 kArms	2.5 AAC	0ADAC2500-BE (Bel Fuse)	280 VAC
RLSB230..					

## Connection diagram

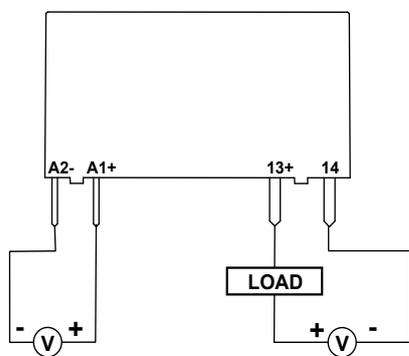
RLSA..  
RLSB..



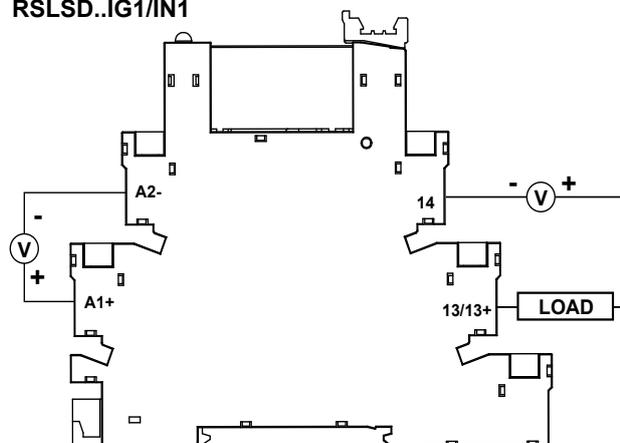
RLSA..IG1/IN1  
RLSB..IG1/IN1



RSLSD..

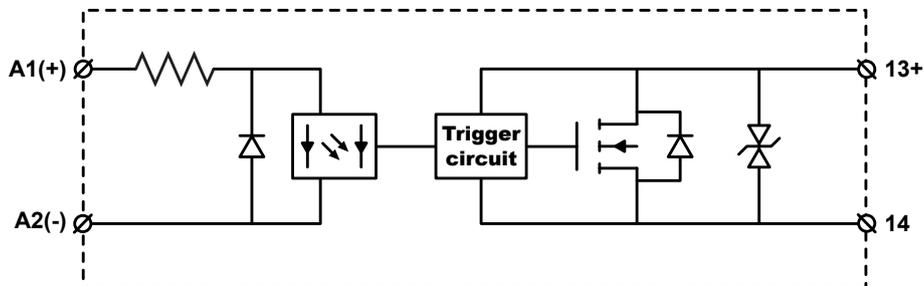


RSLSD..IG1/IN1

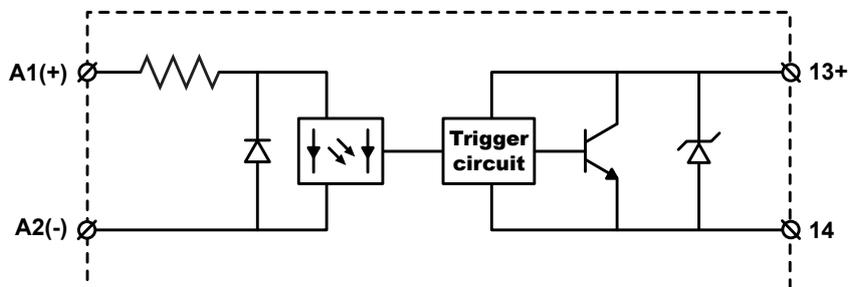


▶ Functional diagram

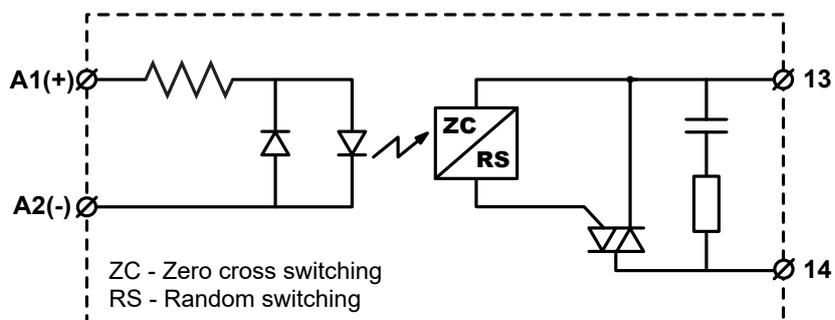
RSLSD024..



RSLSD048..

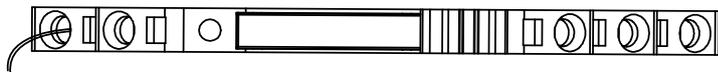
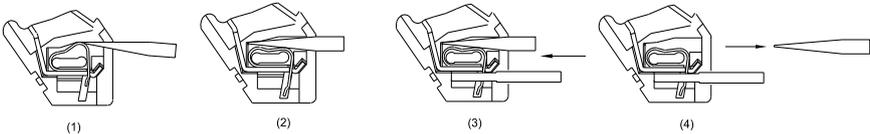


RSLSA/B230..



## Connection Specifications

<b>RSLs..</b>	
<b>Terminals</b>	Copper, nickel-plated
<b>Terminal soldering temperature</b>	Max. 350°C for 10 seconds

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

<b>RSLs..IN1</b>	
<b>Terminals</b>	A1+, A2-, 13/13+, 14
<b>Conductors</b>	Use 75°C copper (Cu) conductors
	
<b>Connection type</b>	Screw terminals
<b>Stripping length</b>	7mm
<b>Rigid (solid &amp; stranded)</b>	1x 0.5 - 2.5 mm <sup>2</sup> 1x 20 - 14 AWG
<b>Rigid (stranded)</b>	2x 0.5 - 1.5 mm <sup>2</sup> 2x 20 - 16 AWG
<b>Torque specifications</b>	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)



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