RP1A..D10, RP1B..D10

1-phase PCB mount solid state relays



Main features

- AC Solid State Relay for PCB mounting
- Zero switching or instant-on
- Rated operational current: 10 AACrms (25 AACrms with forced air cooling)
- Rated operational voltage: Up to 480 VACrms
- Surface mount technology
- Control voltage: 4 to 32 VDC
- Opto-isolation: > 4000 VACrms
- Blocking voltage: Up to 1000 Vp
- Non-repetitive surge current: Up to 250 Ap

Description

The **RP1..D10** is an SSR series for socket- or PCB-mounting, providing an ideal interface between logic controls and AC loads.
The **RP1..D10** is designed for resistive and inductive loads up to 480 VACrms.
The integral heatsink allows switching of a high current in this compact package. Opto-isolation and load switching are performed by individual components, providing higher reliability. This relay can also drive high AC53a loads up to 7 AACrms.
The Solid State technology used can withstand peak voltages of 1000 V, making the RP1..D10 series suitable to drive AC loads such as loaded induction motors.

Applications

These relays can be used to switch heaters, motors, lights, valves or solenoids.

Main functions

- Zero cross or Instant on AC switching
- Ratings up to 480 VACrms, 10 AACrms (25 AACrms with forced air cooling)
- 4-32 VDC control voltage (3-32 VDC for RP1.23D10)

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References

Order code

RP1 ☐ ☐ D10

Enter the code entering the corresponding option instead of ☐

Code	Option	Description	Notes
R	-	Solid State Relay (PCB)	
P	-		
1	-	Number of poles	
☐	A	Switching mode: zero switching	
	B	Switching mode: instant-On switching	
☐	23	Rated operational voltage: 230 VACrms	
	40	Rated operational voltage: 400 VACrms	
	48	Rated operational voltage: 480 VACrms	
D	-	Control voltage: 4 to 32 VDC	3 to 32 VDC for RP1.23D10
10	-	Rated operational current: 10AACrms	

Selection guide

Rated operational voltage	Blocking voltage	Control voltage	Rated operational current 10 AACrms
230 VACrms	650 Vp	3 to 32 VDC	**RP1A23D10**
400 VACrms	850 Vp	4 to 32 VDC	**RP1A40D10**
480 VACrms	1000 Vp	4 to 32 VDC	**RP1A48D10**

CARLO GAVAZZI compatible components

Purpose	Component name/code	Notes
DIN adaptors	RPM2	DIN adaptor 600V with LED Note that when the RP..10 is mounted on DIN rail (vertical mounting), a derating factor has to be applied.

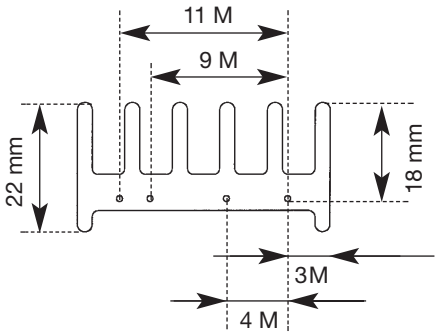
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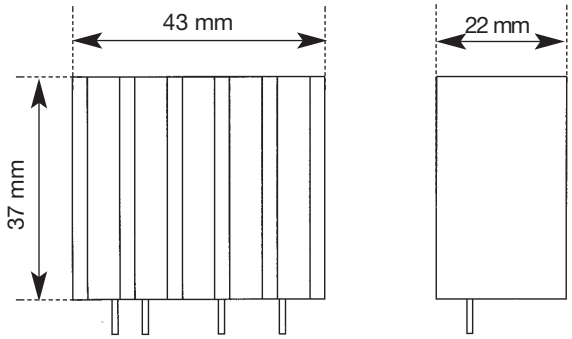
Features

General

Material	Black Epoxy coating
Weight	Approx. 40 g
Isolation: input to output	4 kVACrms

Dimensions





M = 2.54 mm = 1/10 “

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Performance

Mains supply

	RP1.23D10	RP1.40D10	RP1.48D10
Operational voltage range **RP1A** **RP1B**	 12 - 265 VACrms 12 - 265 VACrms	 20 - 440 VACrms 12 - 440 VACrms	 20 - 530 VACrms 12 - 530 VACrms
Operational frequency range	45 - 65 Hz		
Blocking voltage	< 650 Vp	< 850 Vp	< 1000 Vp
Zero voltage turn-on	< 10 VACrms		

Outputs

Rated operational current **AC 51 @ T_a = 25°C** **AC 53a @ T_a = 25°C**	 10 AACrms 7 AACrms
Min. operational load current	10 mAACrms
Power factor	> 0.5
Rep. overload current t=1 s	16 AACrms
Non-rep. surge current t=20 ms	250 Ap
Off-state leakage current @ rated voltage and frequency	< 3 mAACrms
I^2t for fusing t=10 ms	340 A^2s
Critical dV/dt off state min.	1000 V/µs
On-state voltage drop @ rated current	< 1.5 VACrms

Inputs

Control voltage **RP1.23D10** **RP1.40D10, RP1.48D10**	 3-32 VDC 4-32 VDC
Pick-up voltage **RP1.23D10** **RP1.40D10, RP1.48D10**	 2.8 VDC 3.8 VDC
Drop-out voltage	1.2 VDC
Max. input curent **RP1A..D10** **RP1B..D10**	 10 mA 17 mA
Max. reverse voltage	32 VDC
Response time pick-up **RP1A..D10** **RP1A..D10 @ Vin 5VDC**	 ≤ 1/2 cycle ≤ 200 µs
Response time drop-out **RP1B..D10** **RP1B..D10 @ Vin 5VDC**	 ≤ 1/2 cycle ≤ 1/2 cycle

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Derating curve

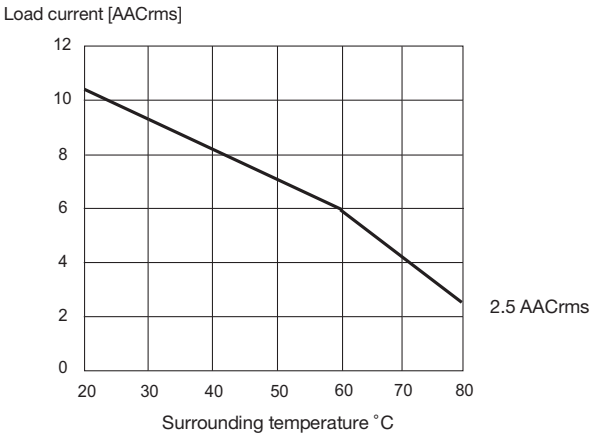


Fig. 1 *Convection cooling*

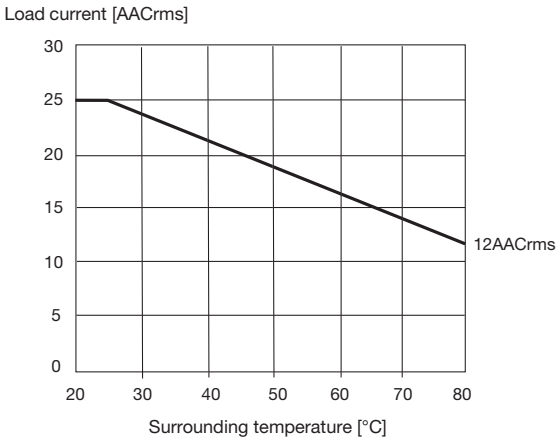


Fig. 2 *Forced air cooling at 15m³/h*

Derating curve is used for finding max. load current at an elevated ambient temperature.
Note: the above indicated current ratings apply only for the RP..10 mounted with fins in the vertical orientation to allow airflow through the heatsink fins. For other mounting orientations please consult your Carlo Gavazzi Sales representative.

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Compatibility and conformity

Standards compliance	LVD: EN 60947-4-3 / EE: BS 60947-4-3 EMCD: EN 61000-6-2, EN 61000-6-4 / EMC: BS 61000-6-2, BS 61000-6-4 UL508 C22.2 No. 14-13
Approvals	

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 1 GHz (PC1) 10 V/m, from 1.4 to 2 GHz (PC1) 10 V/m, from 2 to 2.7 GHz (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 10V/m, from 0.15 to 80 MHz (PC1)
Electrical surge	EN/IEC 61000-4-5 Output, line to line: 1 kV (PC2) Output, line to earth: 1 kV (PC2)[1] Input, line to line: 500 V (PC2)[2] Input, line to earth: 500 V (PC2)[2]
Voltage dips	EN/IEC 61000-4-11 0% for 0.5, 1 cycle (PC2) 40% for 10 cycles (PC2) 70% for 25 cycles (PC2)
Voltage Interruptions	EN/IEC 61000-4-11 0% for 5000ms (PC2)

Electromagnetic compatibility (EMC) - emissions	
Radio interference field emission (radiated)	EN/IEC 55011 Class A: from 30 to 1000 MHz
Radio interference voltage emissions (conducted)	From 0.15 to 30 MHz EN/IEC 55011 Class A (industrial) with filter capacitor across the Mains supply EN/IEC 60947-4-3 Class A (no filtering needed)

Note:

- Performance Criteria 1 (PC1): no degradation of performance or loss of function is allowed when the product is operated as intended.
- Performance Criteria 2 (PC2): during the test, degradation of performance or partial loss of function is allowed. However when the test is complete the product should return operating as intended by itself.
- Performance Criteria 3 (PC3): temporary loss of function is allowed, provided the function can be restored by manual operation of the controls.
- Control input lines must be installed together to maintain products' susceptability to Radio Frequency interference.
- [1] A suppression device, such as a varistor, needs to be connected across the output terminals L1, T1 for immunity against higher voltage levels.
- [2] A suppression device, such as a transil, needs to be connected across the control terminals A1, A2 for immunity against higher voltage levels.
- Use of AC solid state relays may, according to the application and the load current, cause conducted radio interferences. Use of mains filters may be necessary for cases where the user must meet E.M.C requirements.

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Environmental specifications

Operating temperature	-30° to +80°C (-22° to +176°F)
Storage temperature	-40° to +100°C (-40° to +212°F)
Pollution degree	2
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

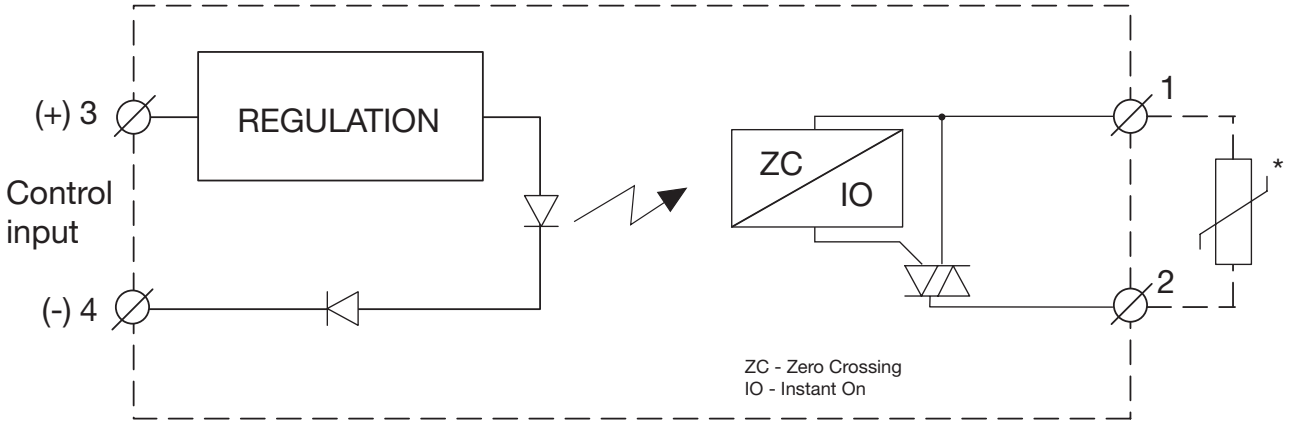
零件名称	有毒或有害物质与元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴化联苯 (PBB)	多溴联苯醚 (PBDE)
功率单元	x	O	O	O	O	O

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。

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Functional diagram



* The varistor is not included in the solid state relay. Connecting a varistor across terminals 1-2 helps protect the solid state relay against damages by over-voltage

Connection specifications

Terminals	Copper alloy, tin-plated
Terminals soldering temperature	max. 300°C for 5 seconds

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