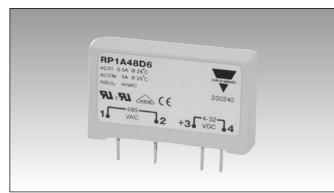
# Solid State Relays PCB, 1-Phase ZS/IO Types RP1A, RP1B



### **Product Description**

The RP1 is an SSR series for socket- or PCB-mounting, providing an ideal interface between logic controls and AC loads. The RP1 is designed for resistive and inductive loads up to 480VACrms. Two regulated control voltage ranges cover most standard input requirements in an economic package. These features allow a direct substitution of existing PCB mounted relays with RP1. Internally this new series enjoys an improved technical design with the introduction of stress-free flexible encapsulation and automated assembly

**Type Selection** 

of components. Opto-isolation and load switching are performed by individual components, providing higher reliability than monolithic designs. Additionally RP1..6 is a special version with high current surge capability that reduces fusing requirements. This relay can also drive higher AC53a loads up to 5 A. The Solid State technology used can withstand peak voltages of 1000V, making the RP1 series suitable to drive AC loads such as valve solenoids and small induction motors.

- AC Solid State Relay for PCB mounting
- Zero switching or instant-on
- Rated operational current: 3, 5 or 5.5 AACrms
- Rated operational voltage: Up to 480 VACrms
- Surface mount technology
- Flexible encapsulation for extended life
- Control voltage: 3 to 32 VDC\* / 16 to 32 VAC\*\*
- Opto-isolation: > 4000 VACrms
- $\bullet$  Non-repetitive peak voltage: Up to 1000  $V_{\text{p}}$
- $\bullet$  Non-repetitive surge current: Up to 250  $A_{\rm p}$

# Ordering Key RP 1 A 23 D 3 Solid State Relay (PCB) Number of poles Switching mode Rated operational voltage Control voltage Rated operational current

Switching mode	Rated operational voltage	Rated operational current	Control voltage
A: Zero switching B: Instant-On switching	23: 230 VACrms 40: 400 VACrms 48: 480 VACrms	3: 3 AACrms 5: 5 AACrms 6: 5.5 AACrms	D: 3 to 32 VDC* A: 16 to 32 VAC** * 4 to 32 VDC for RP1A48 4 to 32 VDC for RP1B40 and RP1B48

### **Selection Guide**

Rated operational voltage	Non-rep. voltage	Control voltage	Rated operational current3 AACrms5 AACrms5.5 AACrms		5.5 AACrms
230 VACrms	650 Vp	3 to 32 VDC	RP1A23D3 RP1B23D3	RP1A23D5 RP1B23D5	RP1A23D6 RP1B23D6
		16 to 32 VAC	-	-	RP1A23A6
400 VACrms	850 Vp	3 to 32 VDC 4 to 32 VDC	RP1A40D3 RP1B40D3	RP1A40D5 RP1B40D5	RP1A40D6 RP1B40D6
480 VACrms	1000 Vp	4 to 32 VDC	RP1A48D3 RP1B48D3	RP1A48D5 RP1B48D5	RP1A48D6 RP1B48D6

### Selection Guide (mounted on DIN EN adaptor)

Rated operational voltage	Non-rep. voltage	Control voltage	Rated operation 3 AACrms	al current 5 AACrms	5.5 AACrms
230 VACrms	650 Vp	5 to 34 VDC	RP1A23D3M1 RP1B23D3M1	RP1A23D5M1 RP1B23D5M1	RP1A23D6M1* RP1B23D6M1
		16 to 32 VAC	-	-	RP1A23A6M1

\* For operational voltages  $\geq$  230 VACrms add suffix M2 to part no.

Specifications are subject to change without notice (30.09.2005)

\*\* Only available for 230V, 5.5 A



### CARLO GAVAZZI

### **General Specifications**

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	RP1.23	RP1.40	RP1.48
Operational voltage range RP1A RP1B	12 - 265 VACrms 12 - 265 VACrms	20 - 440 VACrms 12 - 440 VACrms	20 - 530 VACrms 12 - 530 VACrms
Non-rep. peak voltage	650 V <sub>p</sub>	850 V <sub>p</sub>	1000 V <sub>p</sub>
Rated insulation input to output	4 kVACrms	4 kVACrms	4 kVACrms
Operational frequency range	45 - 65 Hz	45 - 65 Hz	45 - 65 Hz
Power factor	> 0.5	> 0.5	> 0.5
Zero voltage turn-on	< 10 V	< 10 V	< 10 V
Approvals	UL, cUL, VDE*	UL, cUL, VDE*	UL, cUL, VDE*
CE-marking	Yes	Yes	Yes

\* VDE 0700, VDE 0805 (excluding RP1A23A6)

### **Input Specifications**

	RP1A.	RP1A23A6
Control voltage		16 - 32 VAC
RP1.23 RP1A40	3-32 VDC	-
RP1B40 RP1.48	4-32 VDC	-
Pick-up voltage		10 VAC
RP1.23 RP1A40	2.8 VDC	-
RP1B40 RP1.48	3.8 VDC	-
Drop-out voltage	1.2 VDC	5 VAC
Max. input curent		13 mAAC
RP1A	10 mADC	-
RP1B	15 mADC	-
Max. reverse voltage	32 VDC	-
Response time pick-up		
RP1A	< 10 ms	-
RP1B 12 VDC/ 50 Hz	< 160 µs	-
5 VDC/ 50 Hz	< 320 µs	-
Response time drop-out		< 20 ms
RP1A	< 10 ms	-
RP1B	< 10 ms	-

# **Output Specifications**

	RP13	RP15	RP16
Rated operational current AC 51 @ T <sub>a</sub> = 25°C AC 53a @ T <sub>a</sub> = 25°C	3 A 2 A	5 A 3 A	5.5 A 5 A
Min. operational load current	20 mA	20 mA	20 mA
Rep. overload current t=1 s	10 AACrms	12 AACrms	16 AACrms
Non-rep. surge current t=20 ms	65 A <sub>p</sub>	80 Ap	250 A <sub>p</sub>
Off-state leakage current	< 1 mA	< 1 mA	< 1 mA
I <sup>2</sup> t for fusing t=10 ms	20 A <sup>2</sup> s	50 A <sup>2</sup> s	340 A <sup>2</sup> s
Critical dl/dt @ 50 Hz	50 A/µs	20 A/µs	20 A/µs
Critical dV/dt off state min.	250 V/µs	500 V/µs	500 V/µs
On-state voltage drop @ rated current	< 1.2 Vrms	< 1.2 Vrms	< 1.2 Vrms

### **Thermal Specifications**

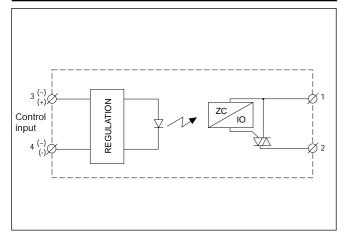
Operating temperature	-20° to +70°C (-4° to +158°F)	
Storage temperature	-40° to +100°C (-40° to +212°F)	

# **Insulation Input - Output**

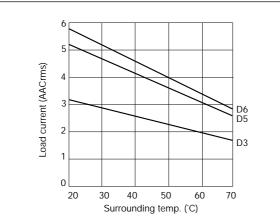
Insulation resistance	$\geq 10^{10} \ \Omega$
Insulation capacitance	≤ 8 pF



### **Functional Diagram**

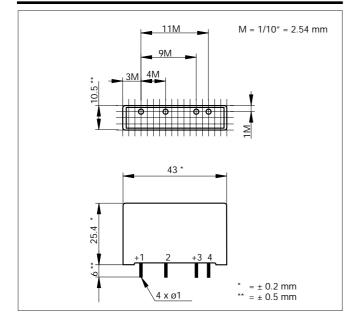


## **Derating Curve**



Derating curve is used for finding max. load current at an elevated ambient temperature. The 3 lines in the graph represent the 3 nominal current ratings of the RP1 series (RP1...D3/D5/D6).

# Dimensions



# Applications

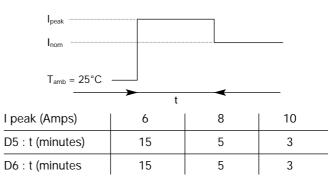
These relays can be used to switch heaters, motors, lights, valves or solenoids.

When used at full load current, the relays must be placed vertically. If more than one relay is mounted, please allow a minimum distance of 20 mm in between for sufficient air cooling.

# **Housing Specifications**

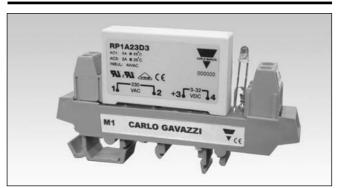
Weight	Approx. 20 g
Housing material	PBT, grey
Terminals	Copper alloy, tin-plated
Potting compound	Flame-retardant flexible silicone rubber

## **Increased Current Options**



Note: Even though the D3 can withstand a slight increase in current for a limited time, it is not recommended for this purpose.

### Accessories



M1 DIN-rail adaptor (photo) M2 DIN-rail adaptor (for V > 230VAC) Varistors Fuses For further information refer to "General Accessories".