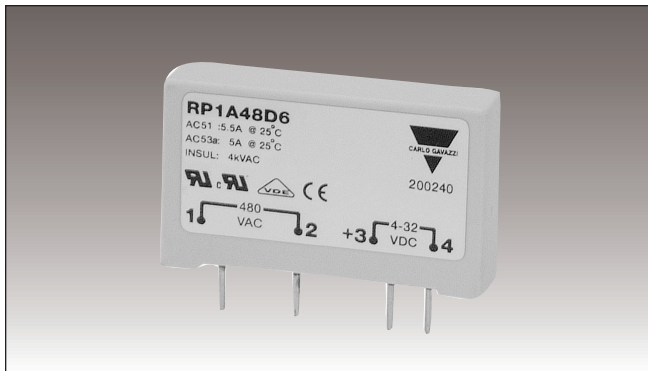


# Solid State Relays PCB, 1-Phase ZS/IO Types RP1A, RP1B

CARLO GAVAZZI



- 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
- Blocking voltage: Up to 1000 V<sub>p</sub>
- Non-repetitive surge current: Up to 250 A<sub>p</sub>

## 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 encapsula-

tion and automated assembly 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.

## 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

## Type Selection

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

## Selection Guide

Rated operational voltage	Non-rep. voltage	Control voltage	Rated operational current		
			3 AACrms	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	RP1A40D3	RP1A40D5	RP1A40D6
		4 to 32 VDC	RP1B40D3	RP1B40D5	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 operational current		
			3 AACrms	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 > 230 VACrms add suffix M2 to part no. Refer to RPM2 datasheet.

\*\* Version RP1A23A6M1 does not include an LED on the DIN adaptor.

## General Specifications

	RP1.23..	RP1.40..	RP1.48..
Operational voltage range			
RP1A...	12 - 265 VACrms	20 - 440 VACrms	20 - 530 VACrms
RP1B...	12 - 265 VACrms	12 - 440 VACrms	12 - 530 VACrms
Blocking 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

	RP1...A.	RP1A23A6
Control voltage		
RP1.23.. RP1A40..	3-32 VDC	16 - 32 VAC
RP1B40.. RP1.48..	4-32 VDC	-
Pick-up voltage		
RP1.23.. RP1A40..	2.8 VDC	10 VAC
RP1B40.. RP1.48..	3.8 VDC	-
Drop-out voltage	1.2 VDC	5 VAC
Max. input current		
RP1A...	10 mADC	13 mAAC
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		
RP1A...	< 10 ms	< 20 ms
RP1B...	< 10 ms	-

## Output Specifications

	RP1....3	RP1....5	RP1....6
Rated operational current			
AC 51 @ T <sub>a</sub> = 25°C	3 A	5 A	5.5 A
AC 53a @ T <sub>a</sub> = 25°C	2 A	3 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 A <sub>p</sub>	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 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

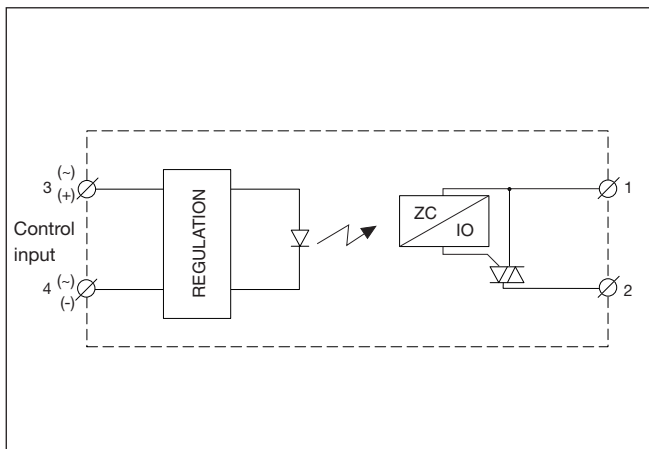
## Thermal Specifications

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	10 <sup>10</sup>
Insulation capacitance	8 pF

## Functional Diagram



## Applications

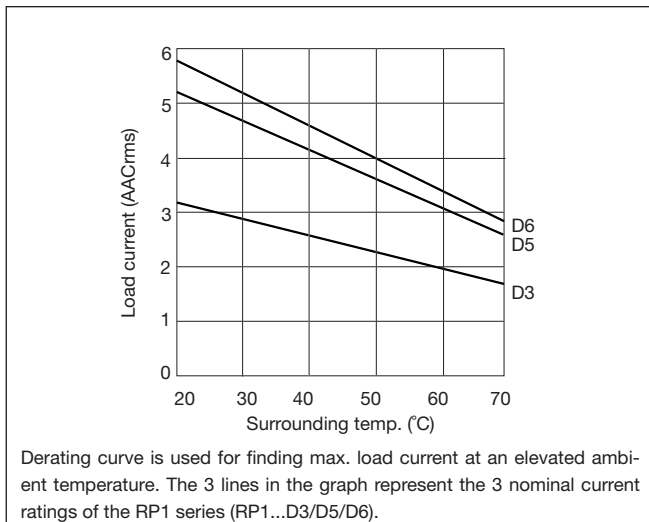
These relays can be used to switch heaters, motors, lights, valves or solenoids.

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.

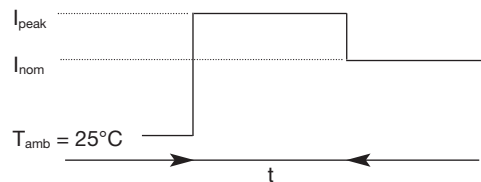
## Housing Specifications

Weight	Approx. 20 g
Housing material	PBT, grey
Terminals	Copper alloy, tin-plated
Terminals soldering temperature	max. 300°C for 5 sec.
Potting compound	Flame-retardant flexible silicone rubber

## Derating Curve



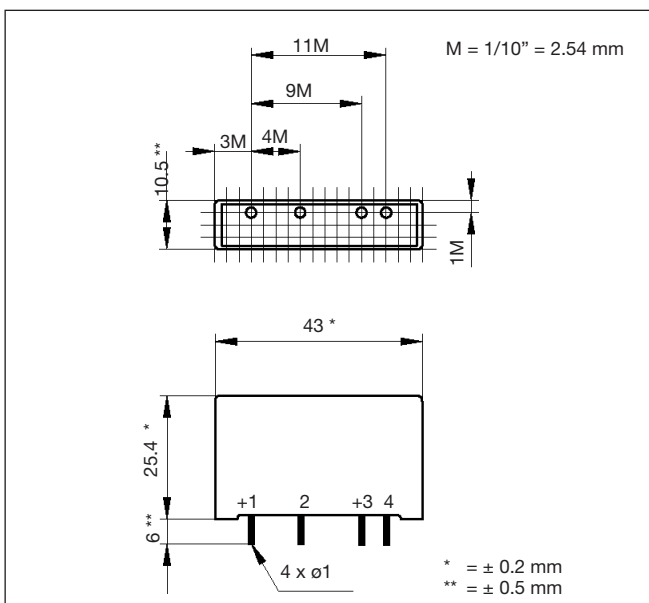
## Increased Current Options



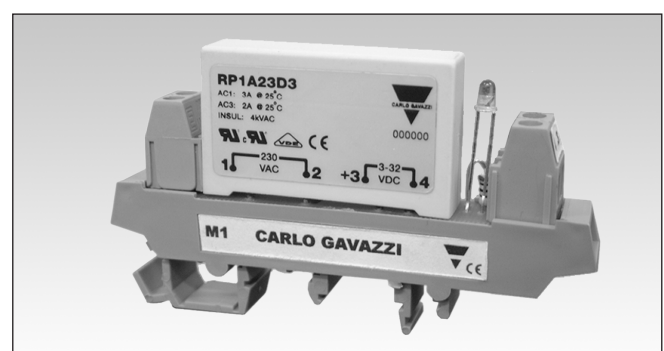
I peak (Amps)	6	8	10
D5 : t (minutes)	15	5	3
D6 : t (minutes)	15	5	3

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

## Dimensions



## Accessories



- M1 DIN-rail adaptor (photo)
- M2 DIN-rail adaptor (for V > 230VAC)
- Varistors
- Fuses

For further information refer to "General Accessories".