

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



- AC Solid State Relay for PCB mounting
- Zero switching or instant-on
- Rated operational current: 3, 5 or 5.5 A
- Rated operational voltage: Up to 480 V
- Surface mount technology
- Flexible encapsulation for extended life
- Control voltage: 3 to 32 VDC*
- Opto-isolation: > 4000 VACrms
- Non-repetitive peak voltage: 1000 Vp
- Non-repetitive surge current up to 300 A

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 480V. One regulated control voltage covers all 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 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 AC3 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 V	3: 3 A	D: 3 to 32 VDC*
B: Instant-On switching	40: 400 V	5: 5 A	
	48: 480 V	6: 5.5 A	* 4 to 32 VDC for 480 VAC types

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
400 VACrms	850 Vp	3 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 operational current		
			3 AACrms	5 AACrms	5.5 AACrms
230 VACrms	650 Vp	3 to 32 VDC	RP1A23D3M1 RP1B23D3M1	RP1A23D5M1 RP1B23D5M1	RP1A23D6M1 RP1B23D6M1



General Specifications

	RP1.23D.	RP1.40D.	RP1.48D.
Operational voltage range	12 - 265 VACrms	12 - 440 VACrms	12 - 530 VACrms
Non-rep. peak voltage	650 V _p	850 V _p	1000 V _p
Rated insulated input to output out to heatsink	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 0850

Input Specifications

Control voltage RP1.23D., RP1.40D. RP1.48D.	3 - 32 VDC 4 - 32 VDC
Pick-up voltage RP1.23D., RP1.40D. RP1.48D.	2.5 VDC 3.5 VDC
Drop-out voltage	1.2 VDC
Input current max.	10 mADC
Max. reverse voltage	32 VDC
Response time pick-up RP1A RP1B	< 10 ms
12 VDC/50 Hz 5 VDC/50 Hz	< 160 μs < 320 μs
Response time drop-out RP1A RP1B	< 10 ms < 10 ms

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 ¹⁰ Ω
Insulation capacitance	≤ 8 pF

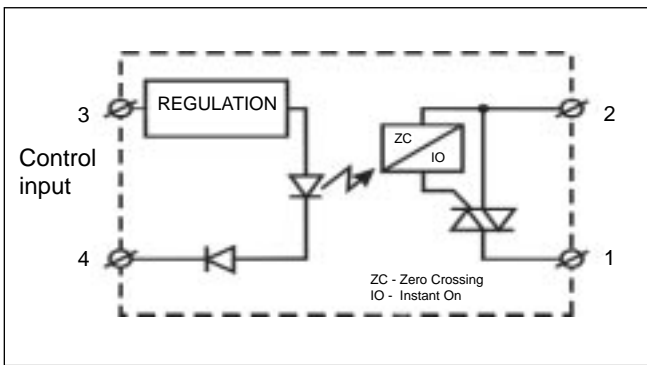
Housing Specifications

Weight	Approx. 20 g
Housing material	Dupont Crastin SK605, grey
Terminals	Copper alloy, tin-plated
Potting compound	Flame-retardant flexible silicone rubber

Output Specifications

	RP1....D3	RP1....D5	RP1....D6
Rated operational current AC 51 @ T _a = 25°C AC 53a @ T _a = 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 A _p	12 A _p	16 A _p
Non-rep. surge current t=20 ms	65 A _p	80 A _p	300 A _p
Off-state leakage current	< 1 mA	< 1 mA	< 1 mA
I ² t for fusing t=10 ms	20 A ² s	50 A ² s	400 A ² s
Critical di/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

Functional Diagram

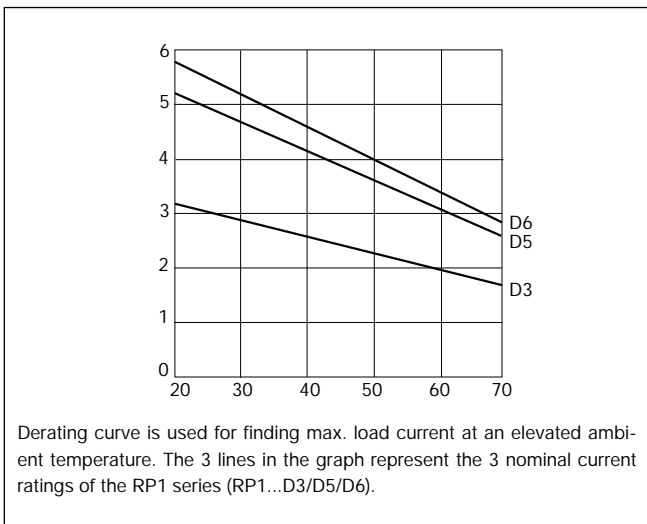


Applications

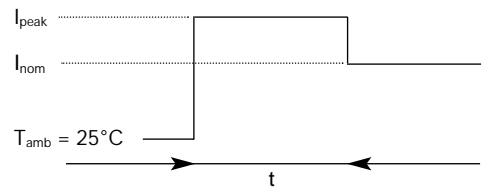
These relays can be used to switch heaters, motors, lights, valves or solenoids.

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.

Derating Curve



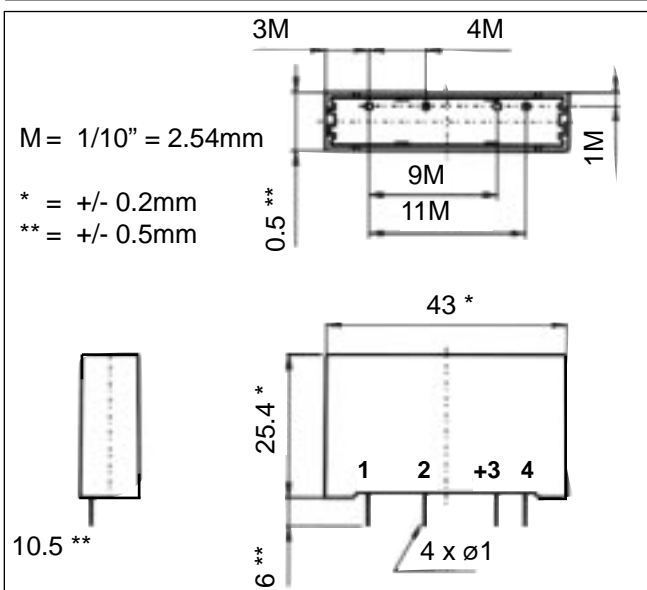
Increased Current Options



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)

Varistors

Fuses

For further information refer to "General Accessories".