Solid State Relays
Industrial, 1-Phase PS
Types RC 24 .. -D 06, RC 44 .. -D 12

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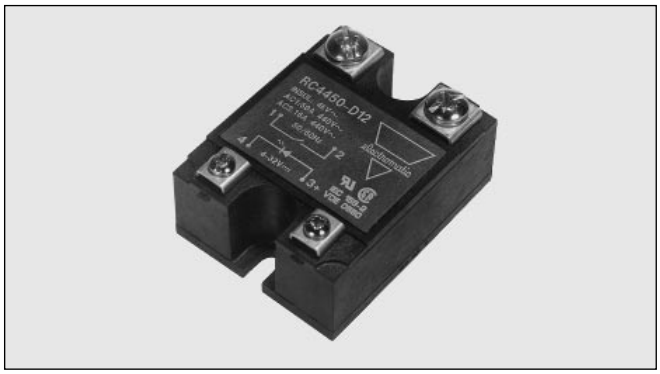

- **AC Solid State Relay**
- **Peak switching for transformers**
- **Rated operational current: 10, 25 and 50 AACrms**
- **Non-repetitive voltage: Up to 1200 V_p**
- **Rated operational voltage: Up to 400 VACrms**
- **Input range: 4 to 32 VDC**
- **Insulation: OPTO (input-output) 4000 VACrms**

Product Description

The peak switching relay is for switching on transformers/inductive loads in which the saturated iron core can cause severe inrush currents. The peak switching relay always switches ON at the first peak voltage in the AC sinusoidal curve after the control voltage is applied. The relay switches OFF when the current crosses zero.

Ordering Key

RC 24 10 -D 06

- **Solid State Relay**
- **Switching mode**
- **Rated operational voltage**
- **Rated operational current**
- **Control voltage**
- **Non-rep. peak voltage**

Type Selection

Switching mode	Rated operational voltage	Rated operational current	Control voltage	Non-rep. voltage
C: Peak switching	24: 230 VACrms 44: 400 VACrms	10: 10 AACrms 25: 25 AACrms 50: 50 AACrms	-D: 4 to 32 VDC	06: 650 V_p 12: 1200 V_p

Selection Guide

Rated operational voltage	Control voltage	Rated operational current 10 AACrms	25 AACrms	50 AACrms
230 VACrms	4 to 32 VDC	**RC 2410 -D 06**	**RC 2425 -D 06**	**RC 2450 -D 06**
400 VACrms	4 to 32 VDC	**RC 4410 -D 12**	**RC 4425 -D 12**	**RC 4450 -D 12**

General Specifications

	RC 24.. -D 06	RC 44.. -D 12
Operational voltage range	90 to 280 VACrms	180 to 480 VACrms
Non-rep. peak voltage	≥ 650 V_p	≥ 1200 V_p
Operational frequency range	45 to 65 Hz	45 to 65 Hz
Power factor	≥ 0.5 @ 230 VACrms	≥ 0.5 @ 400 VACrms
Approvals	UL, CSA	UL, CSA
CE-marking	Yes	Yes

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Input Specifications

Control voltage range	4 to 32 VDC
Pick-up voltage	≤ 4 VDC
Drop-out voltage	≥ 1 VDC
Reverse voltage	≤ 32 VDC
Input impedance	1 kΩ
Response time pick-up	≤ 1/2 cycle
Response time drop-out	≤ 1/2 cycle
Input pulse, rise/fall time	≤ 100 µs

Insulation

Rated insulation voltage Input to output	≥ 4000 VACrms
Rated insulation voltage Output to case	≥ 4000 VACrms
Insulation resistance Input to output	≥ 10^{10} Ω
Insulation resistance Ouput to case	≥ 10^{10} Ω
Insulation capacitance Input to output	≤ 8 pF
Insulation capacitance Output to case	≤ 50 pF

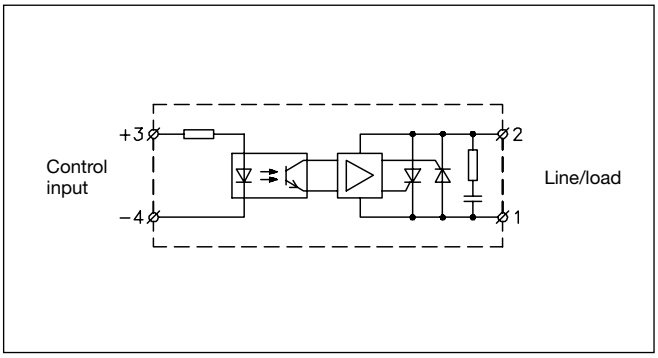
Output Specifications

	RC .. 10 -D ..	RC .. 25 -D ..	RC .. 50 -D ..
Rated operational current AC1	10 Arms	25 Arms	50 Arms
Minimum operational current	100 mArms	100 mArms	100 mArms
Rep. overload current t=1 s	≤ 50 A_p	≤ 80 A_p	≤ 175 A_p
Non-rep. surge current t=20 ms	160 A_p	250 A_p	600 A_p
Off-state leakage current @ rated voltage and frequency	≤ 5 mArms	≤ 5 mArms	≤ 5 mArms
I^2t for fusing t=1-10 ms	≤ 130 A^2s	≤ 310 A^2s	≤ 1800 A^2s
Critical dI/dt	≥ 100 A/µs	≥ 100 A/µs	≥ 100 A/µs
On-state voltage drop @ rated current	≤ 1.6 Vrms	≤ 1.6 Vrms	≤ 1.6 Vrms
Critical dV/dt commutating	≤ 1 kV/µs	≤ 1 kV/µs	≤ 1 kV/µs
Critical dV/dt off-state	≥ 1 kV/µs	≥ 1 kV/µs	≥ 1 kV/µs

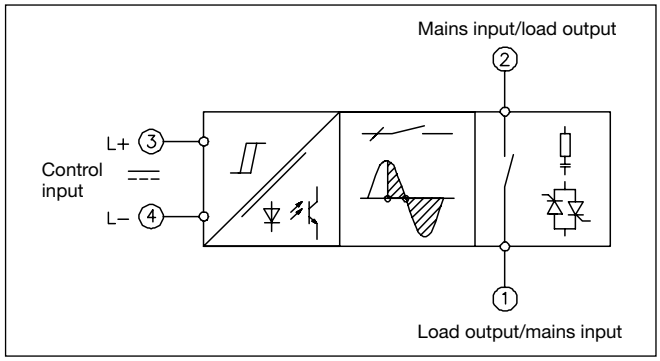
Thermal Specifications

	RC .. 10 -D ..	RC .. 25 -D ..	RC .. 50 -D ..
Operating temperature	-20° to +70°C (-4° to +158°F)	-20° to +70°C (-4° to +158°F)	-20° to +70°C (-4° to +158°F)
Storage temperature	-40° to +100°C (-40° to +212°F)	-40° to +100°C (-40° to +212°F)	-40° to +100°C (-40° to +212°F)
Junction temperature	≤ 125°C (257°F)	≤ 125°C (257°F)	≤ 125°C (257°F)
R_{th} junction to case	≤ 2 K/W	≤ 1.25 K/W	≤ 0.65 K/W
R_{th} junction to ambient	≤ 12.5 K/W	≤ 12 K/W	≤ 12 K/W

Wiring Diagram



Functional Diagram



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Heatsink Dimensions (load current versus ambient temperature)

RC .. 10 -D ..

Load current [A]	Thermal resistance [K/W]						Power dissipation [W]
16	2.7	2.2	1.8	1.3	0.87	0.41	22
15	3.1	2.6	2.1	1.7	1.2	0.65	20
14	3.7	3.1	2.6	2	1.5	0.92	18
13	4.3	3.7	3.1	2.5	1.9	1.2	16
12	5	4.3	3.7	3	2.3	1.6	15
11	5.9	5.1	4.4	3.6	2.8	2.1	13
10	6.9	6	5.2	4.3	3.5	2.6	12
9	7.9	6.9	5.9	4.9	4	3	10
7	10.8	9.5	8.1	6.8	5.4	4.1	7
5	-	14.2	12.2	10.2	8.1	6.1	5
3	-	-	-	-	14.6	10.9	3
1	-	-	-	-	-	-	1
	20	30	40	50	60	70	T_A

Ambient temp. [°C]

RC .. 25 -D ..

Load current [A]	Thermal resistance [K/W]						Power dissipation [W]
25	2	1.7	1.4	1	0.71	0.40	32
22.5	2.5	2.1	1.8	1.4	1	0.66	27
20	3.1	2.7	2.3	1.9	1.4	1	23
17.5	4.0	3.5	3	2.5	2	1.4	20
15	4.9	4.3	3.7	3.1	2.5	1.9	16
12.5	6.2	5.4	4.6	3.9	3.1	2.3	13
10	8.1	7.1	6.1	5.1	4	3	10
7.5	11.3	9.9	8.5	7.1	5.6	4.2	7
5	-	15.6	13.3	11.1	8.9	6.7	5
2.5	-	-	-	-	18.7	14	2
	20	30	40	50	60	70	T_A

Ambient temp. [°C]

RC ..50 -D ..

Load current [A]	Thermal resistance [K/W]						Power dissipation [W]
50	0.92	0.76	0.60	0.45	0.29	-	63
45	1.2	0.99	0.80	0.62	0.44	0.26	55
40	1.5	1.3	1.1	0.85	0.63	0.42	47
35	1.9	1.6	1.4	1.1	0.89	0.63	40
30	2.4	2.1	1.8	1.5	1.2	0.91	33
25	3	2.7	2.3	1.9	1.5	1.1	26
20	3.9	3.5	3	2.5	2	1.5	20
15	5.5	4.8	4.1	3.4	2.7	2.1	15
10	8.6	7.5	6.4	5.4	4.3	3.2	9
5	17.9	15.6	13.4	11.2	8.9	6.7	4
	20	30	40	50	60	70	T_A

Ambient temp. [°C]

Heatsink Selection

Carlo Gavazzi Heatsink (see Accessories)	**Thermal resistance**
No heatsink required	$R_{th\ s\text{-}a}$ > 12.5 K/W
RHS 100 Assy	3.0 K/W
RHS 301 Assy	0.8 K/W
RHS 301 F Assy	0.25 K/W
Consult your distributor	< 0.25 K/W

Compare the value found in the current versus temperature chart with the standard heatsink values and select the heatsink with the next lower value.

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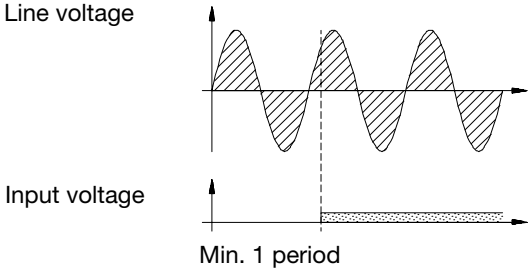
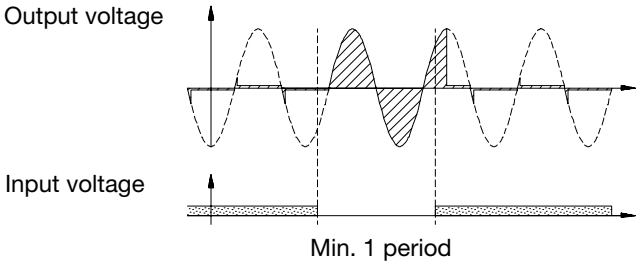
Applications

Timing

Initial turn-on
The line voltage must be present at least 1 period before the input voltage is applied.



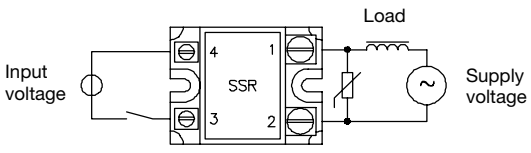
Repetitive turn-on
The input voltage must be lower than the drop out voltage limit at least 1 period before it is reapplied.



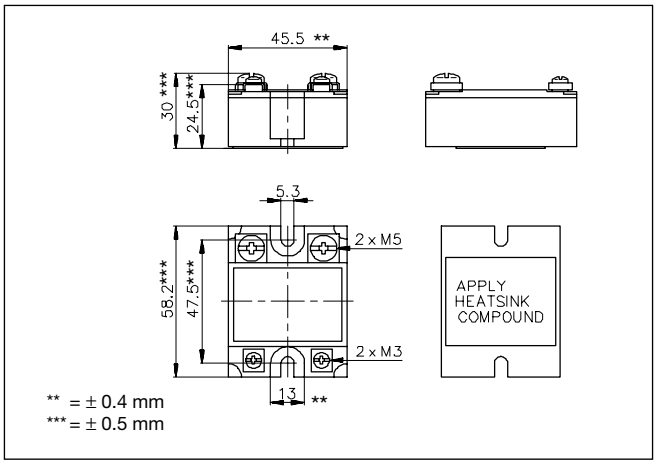
Overvoltage protection

As transformers can have varying stray inductances and stray capacitances, it is always advisable to use external overvoltage protection.

Varistor diameter: ≤ 20 mm
Varistor voltage for 240 V SSR: 250 VAC (RV 02)
Varistor voltage for 440 V SSR: 480 VAC (RV 05)



Dimensions



Housing Specifications

Weight	Approx. 110 g
Housing material	Noryl GFN 1, black
Base plate	Aluminium
Potting compound	Polyurethane
Relay	
Mounting screws	M5
Mounting torque	≤ 1.5 Nm
Control terminal	
Mounting screws	M3 x 6
Mounting torque	≤ 0.5 Nm
Power terminal	
Mounting screws	M5 x 6
Mounting torque	≤ 2.4 Nm

Accessories

Protection cover
Heatsinks
DIN rail adapter
Varistors
Fuses

For further information refer to "General Accessories".