

Solid State Relays Industrial, 1-Phase ZS Types RA 24.. -D 06 T, RA 24.. -D 06 TF

CARLO GAVAZZI



- AC Solid State Relay
- Zero switching
- Low-cost triac type
- Rated operational current: 10 and 25 AACrms
- Non-repetitive voltage: Up to 650 V_p
- Rated operational voltage: 230 VACrms
- Input ranges: 3 to 32 VDC
- Insulation: OPTO (input-output) 4000 VACrms
- Fast-on version available

Product Description

The triac version of the zero switching relay is an inexpensive solution for resistive loads. The zero switching re-

lay switches ON when the AC sine curve just crosses zero, and switches OFF when the current crosses zero.

Ordering Key

RA 24 10 -D 06 T

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

Type Selection

Switching mode	Rated operational voltage	Rated operational current	Control voltage	Non-rep. voltage	Output
A: Zero switching	24: 230 VACrms	10: 10 AACrms 25: 25 AACrms	-D: 3 to 32 VDC	06: 650 V _p	T: Triac TF: Triac/Fast-on terminals

Selection Guide

Rated operational voltage	Non-rep. voltage	Terminal type	Control voltage	Rated operational current 10 AACrms	Rated operational current 25 AACrms
230 VACrms	650 V _p	Rivet terminals	3 to 32 VDC	RA 2410 -D 06T	RA 2425 -D 06T
230 VACrms	650 V _p	Fast-on terminals	3 to 32 VDC	RA 2410 -D 06TF	RA 2425 -D 06TF

General Specifications

Operational voltage range	24 to 280 VACrms
Non-rep. peak voltage	≥ 650 V _p
Operational frequency range	45 to 65 Hz
Power factor	≥ 0.5 @ 230 VACrms
Approvals	CSA, UL
CE-marking	Yes

Insulation

Rated insulation voltage Input to output	≥ 4000 VACrms
Rated insulation voltage Output to case	≥ 4000 VACrms
Insulation resistance Input to output	≥ 10 ¹⁰ W
Insulation resistance Output to case	≥ 10 ¹⁰ W
Insulation capacitance Input to output	≤ 8 pF
Insulation capacitance Output to case	≤ 25 pF



Input Specifications

	RA 24 .. -D 06T/TF
Control voltage range	3 to 32 VDC
Pick-up voltage	≤ 3 V
Drop-out voltage	≥ 1 V
Reverse voltage	≤ 32 VDC
Input impedance	1.5 kW
Response time pick-up	≤ 1/2 cycle
Response time drop-out	≤ 1/2 cycle

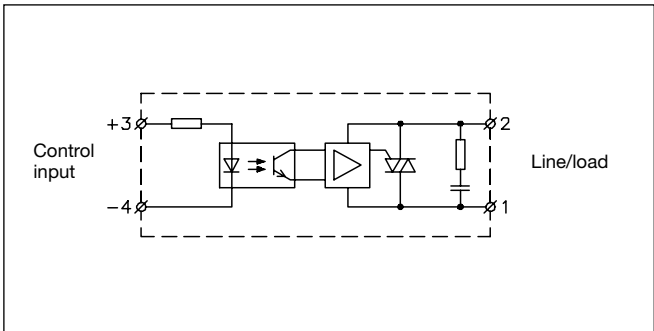
Output Specifications

	RA 2410 -D 06 T/F	RA 2425 -D 06 T/F
Rated operational current AC 1	10 Arms	25 Arms
Minimum operational current	20 mArms	20 mArms
Rep. overload current t=1 s	≤ 30 A _p	≤ 50 A _p
Non-rep. surge current t=20 ms	90 A _p	200 A _p
Off-state leakage current @ rated voltage and frequency	≤ 5 mArms	≤ 5 mArms
I ² t for fusing t=1-10 ms	≤ 40 A ² s	≤ 200 A ² s
Critical dI/dt	≥ 10 A/μs	≥ 10 A/μs
On-state voltage drop @ rated current	≤ 1.6 Vrms	≤ 1.6 Vrms
Critical dV/dt commutating	≥ 10 V/μs	≥ 10 V/μs
Critical dV/dt off-state	≥ 250 V/μs	≥ 250 V/μs

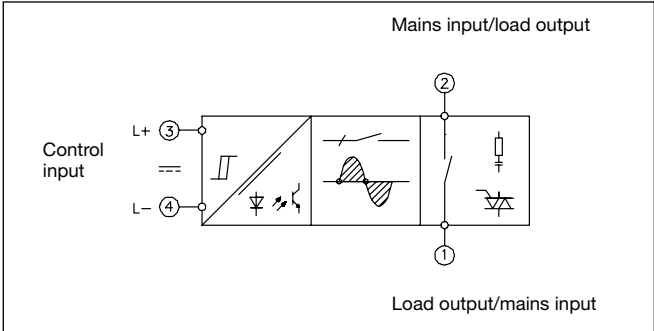
Thermal Specifications

	RA 2410 -D 06 T/TF	RA 2425 -D 06 T/TF
Operating temperature	-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)
Junction temperature	≤ 125°C (≤ 257°F)	≤ 125°C (≤ 257°F)
R _{th} junction to case	≤ 2.5 K/W	≤ 1.8 K/W
R _{th} junction to ambient	≤ 12.5 K/W	≤ 12.5 K/W

Wiring Diagram



Functional Diagram



Heatsink Dimensions (load current versus ambient temperature)

RA 24 10 .. T/F

Load current [A]	Thermal resistance [K/W]						Power dissipation [W]
	20	30	40	50	60	70	T _A
10	6.5	5.6	4.7	3.9	3	2.1	12
9	7.8	6.8	5.8	4.8	3.8	2.8	10
8	9.2	8	6.9	5.7	4.6	3.4	9
7	10.8	9.5	8.1	6.8	5.4	4.1	7
6	-	11.4	9.8	8.2	6.5	4.9	6
5	-	-	12.2	10.2	8.1	6.1	5
4	-	-	-	-	10.5	7.9	4
3	-	-	-	-	-	10.9	3
2	-	-	-	-	-	-	2
1	-	-	-	-	-	-	1

Ambient temp. [°C]

RA 24 25 .. T/F

Load current [A]	Thermal resistance [K/W]						Power dissipation [W]
	20	30	40	50	60	70	T _A
25	1.4	1.1	0.77	0.45	-	-	32
23	1.9	1.5	1.2	0.79	0.43	-	28
20	2.5	2.1	1.6	1.2	0.81	0.39	24
18	3.3	2.8	2.3	1.8	1.3	0.8	20
15	4.3	3.7	3.1	2.5	2	1.4	17
13	5.8	5.1	4.4	3.6	2.8	2.2	14
10	7.6	6.7	5.7	4.8	3.8	2.9	11
8	10.5	9.2	7.9	6.6	5.3	4	8
5	-	14.4	12.3	10.3	8.2	6.2	5
3	-	-	-	-	17.1	12.8	3

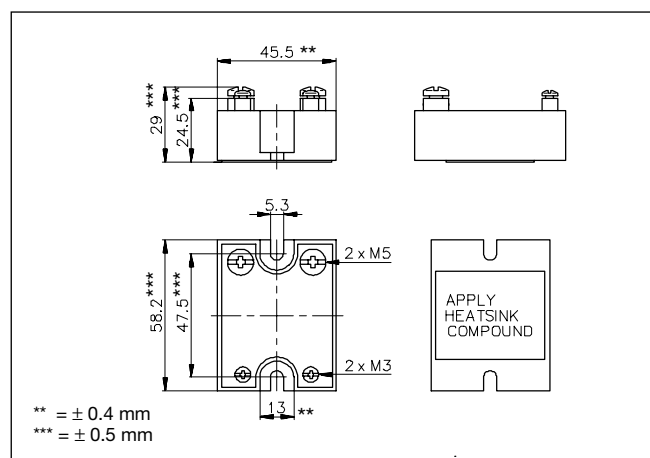
Ambient temp. [°C]

Heatsink Selection

Carlo Gavazzi Heatsink (see Accessories)	Thermal resistance
No heatsink required	$R_{th\ s-a} > 12.5$ 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.

Dimensions



Accessories

Protection cover	For further information refer to "General Accessories".
Heatsinks	
DIN rail adapter	
Varistors	
Fuses	

Terminals RA 24.. -D 06 TF

Control terminal (Fast-on)	6.3 x 0.8 mm
Power terminal (Fast-on)	6.3 x 0.8 mm

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/Fast-on	M3 x 6/6.3 x 0.8 mm
Mounting torque	≤ 0.5 Nm
Power terminal	
Mounting screws/Fast-on	M5 x 6/6.3 x 0.8 mm
Mounting torque	≤ 2.4 Nm