

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



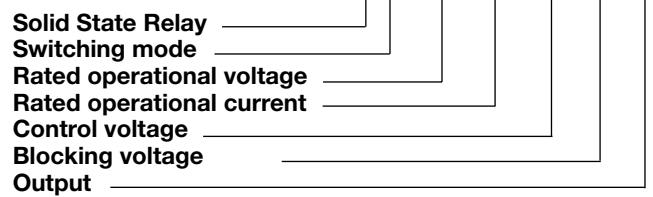
- AC Solid State Relay
- Zero switching
- Low-cost triac type
- Rated operational current: 10 and 25 AACrms
- Blocking voltage: Up to 650 V<sub>p</sub>
- Rated operational voltage: 230 VACrms
- Input ranges: 3 to 32 VDC
- Isolation: OPTO (input-output) 4000 VACrms
- Fast-on version available

## Product Description

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



## Type Selection

Switching mode	Rated operational voltage	Rated operational current	Control voltage	Blocking voltage	Output
A: Zero switching	24: 230 VACrms	10: 10 AACrms 25: 25 AACrms	-D: 3 to 32 VDC	06: 650 V <sub>p</sub>	T: Triac TF: Triac/Fast-on terminals

## Selection Guide

Rated operational voltage	Blocking voltage	Terminal type	Control voltage	Rated operational current	
				10 AACrms	25 AACrms
230 VACrms	650 V <sub>p</sub>	Rivet terminals	3 to 32 VDC	RA 2410 -D 06T	RA 2425 -D 06T
		Fast-on terminals		RA 2410 -D 06TF	RA 2425 -D 06TF

## General Specifications

Operational voltage range	24 to 280 VACrms
Blocking voltage	≥ 650 V <sub>p</sub>
Operational frequency range	45 to 65 Hz
Power factor	≥ 0.5 @ 230 VACrms
Approvals	CSA, UL
CE-marking	Yes

## Isolation

Rated isolation voltage	Input to output	≥ 4000 VACrms
	Output to case	≥ 4000 VACrms
Insulation resistance	Input to output	≥ 10 <sup>10</sup> W
	Output to case	≥ 10 <sup>10</sup> W
Insulation capacitance	Input to output	≤ 8 pF
	Output to case	≤ 25 pF



## Input Specifications

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 kΩ
Response time pick-up	≤ 1/2 cycle
Response time drop-out	≤ 1/2 cycle

## 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

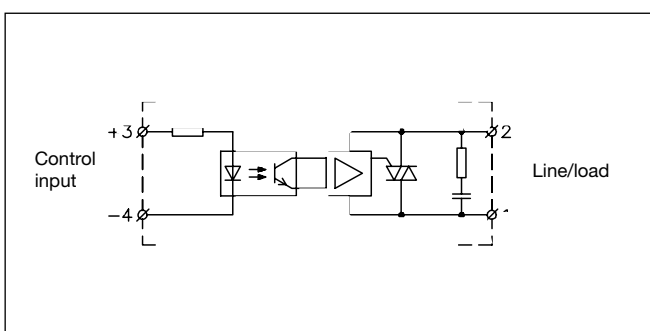
## Output Specifications

	RA 2410 -D 06 T/F	RA 2425 -D 06 T/F
Rated operational current AC 50	10 Arms	25 Arms
Minimum operational current	20 mArms	20 mArms
Rep. overload current t=1 s	≤ 30 A <sub>p</sub>	≤ 50 A <sub>p</sub>
Non-rep. surge current t=20 ms	90 A <sub>p</sub>	200 A <sub>p</sub>
Off-state leakage current @ rated voltage and frequency	≤ 5 mArms	≤ 5 mArms
I <sup>2</sup> t for fusing t=10 ms	≤ 40 A <sup>2</sup> s	≤ 200 A <sup>2</sup> 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

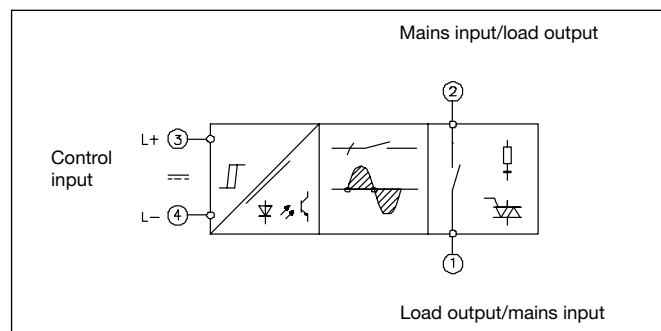
## Thermal Specifications

	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 <sub>th</sub> junction to case	≤ 2.5 K/W	≤ 1.8 K/W
R <sub>th</sub> 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	
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

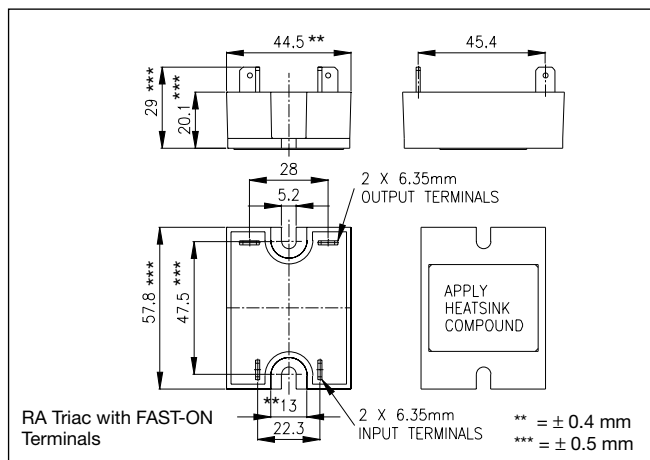
Ambient temp. [°C]

RA 24 25 ... T/F

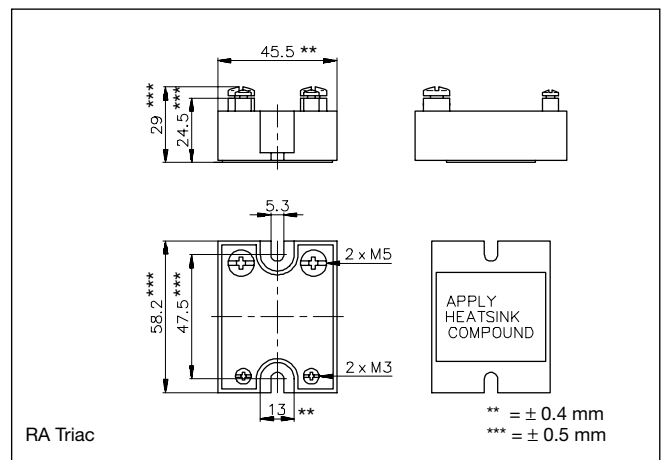
Load current [A]	Thermal resistance [K/W]						Power dissipation [W]
	20	30	40	50	60	70	
25	1.4	1.1	0.77	0.45	-	-	32
23	1.9	1.5	1.2	0.79	0.43	-	28
20	2.5	2.1	1.6	1.2	0.81	0.39	24
18	3.3	2.8	2.3	1.8	1.3	0.8	20
15	4.3	3.7	3.1	2.5	2	1.4	17
13	5.8	5.1	4.4	3.6	2.8	2.2	14
10	7.6	6.7	5.7	4.8	3.8	2.9	11
8	10.5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

## Dimensions



All dimensions in mm



All dimensions in mm

## Accessories

- Protection cover
- Heatsinks
- DIN rail adapter
- Varistors
- Fuses

For further information refer to "General Accessories".

## 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

## 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.