

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

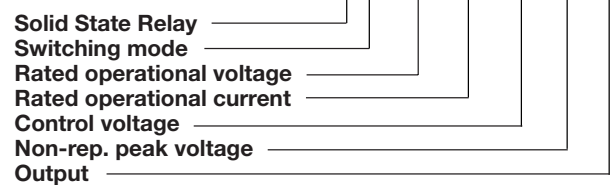


- AC Solid State Relay
- Zero switching
- Low-cost triac type
- Rated operational current: 10 and 25 AACrms
- Non-repetitive voltage: Up to 650 Vp
- Rated operational voltage: Up to 240 VACrms
- Input ranges: 3 to 32 VDC
- Insulation: OPTO (input-output) 4000 VACrms
- Fast-on version available

Product Description

The triac version of the zero switching relay is an inexpensive solution for resistive loads. The zero switching 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 | 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 | 25 AACrms |
| 230 VACrms | 650 Vp | Rivet terminals | 3 to 32 VDC | RA 2410 -D 06T | RA 2425 -D 06T |
| 230 VACrms | 650 Vp | 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 Vp |
| Operational frequency range | 45 to 65 Hz |
| Power factor | ≥ 0.5 @ 230 VACrms |
| Approvals | CSA, UL |

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 | |
| Output to case | ≥ 10 ¹⁰ Ω |
| 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 kΩ |
| 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, 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 |

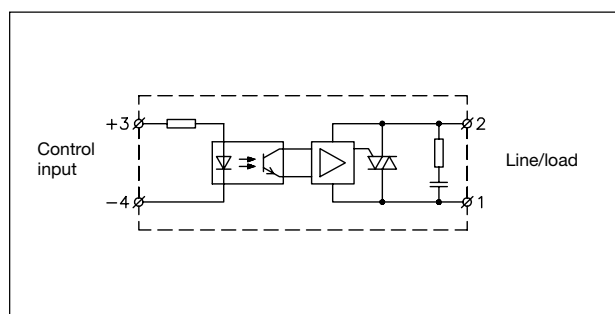
Thermal Specifications

RA 2410 -D 06 T/TF

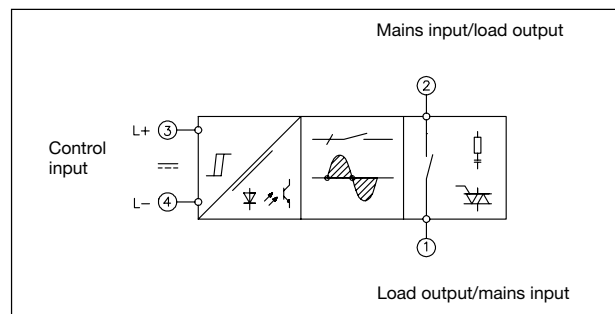
RA 2425 -D 06 T/TF

| | | |
|-------------------------------------|-------------------------------|-------------------------------|
| Operating temperature | -40 to +100°C (-40 to +212°F) | -40 to +100°C (-40 to +212°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 | |
| 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 |

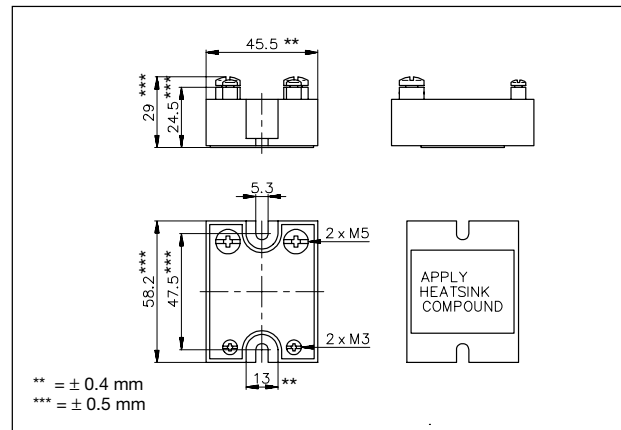
Ambient temp. [°C]

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 |