

Solid State Relays Industrial, 1-Phase ZS w. LED Type RS 25E, RS 40E



- Zero switching AC Solid State Relay
- LED indication
- Clip-on IP 20 protection cover
- Self-lifting terminals
- Housing free of moulding mass
- AC or DC control
- Operational ratings Up to 40 AACrms and 480 VAC
- Blocking voltage: Up to 800 V_p
- Opto-insulation: > 4000 VACrms
- Built-in varistor



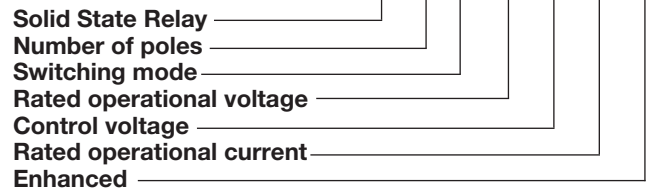
Product Description

The zero switching relay with triac output is an inexpensive solution for resistive loads. The zero switching relay switches ON when the sinusoidal voltage crosses zero and switches OFF when

the current crosses zero. The LED indicates the status of the control input. The clip-on cover is securing touch protection to IP 20.

Ordering Key

RS 1 A 40 D 25 E



Type Selection

| Switching mode | Rated operational voltage | Rated operational current | Control voltage |
|-------------------|----------------------------------|--------------------------------|------------------------------------|
| A: Zero Switching | 40: 400 VACrms 48: 480 VACrms | 25: 25 AACrms 40: 40 AACrms | D: 3 to 32 VDC A: 80 to 250 VAC |

Housing Specifications

| | |
|-------------------------|--------------------|
| Weight | Approx. 100 g |
| Housing material | Noryl GFN 1, black |
| Baseplate | Aluminium |
| Potting compound | None |
| Relay | |
| Mounting screws | M5 |
| Mounting torque | 1.5-2.0 Nm |
| Control terminal | |
| Mounting screws | M3 x 9 |
| Mounting torque | 0.5 Nm |
| Power terminal | |
| Mounting screws | M5 x 9 |
| Mounting torque | 2.4 Nm |

Isolation

| | |
|--------------------------------|---------------|
| Rated isolation voltage | |
| Input to output | ≥ 4000 VACrms |
| Input to case | ≥ 4000 VACrms |
| Output to case | ≥ 2500 VACrms |

Thermal Specifications

| | |
|------------------------------|----------------------|
| Operating temperature | -20° to 70°C |
| Storage temperature | -40° to 100°C |
| Relative Humidity | < 95% non-condensing |

Selection Guide

| Rated operational voltage | Blocking voltage | Control voltage | Rated operational current | |
|---------------------------|--------------------|-----------------|---------------------------|-------------------|
| | | | 25 A | 40 A |
| 400 VACrms | 600 V _p | 3 - 32 VDC | RS1A40D25E | RS1A40D40E |
| | | 80-250 VAC | RS1A40A25E | RS1A40A40E |
| 480 VACrms | 800 V _p | 3 - 32 VDC | RS1A48D25E | RS1A48D40E |
| | | 80-250 VAC | RS1A48A25E | RS1A48A40E |

General Specifications

| | RS1A40...E | RS1A48...E |
|-----------------------------|---------------------|---------------------|
| Operational voltage range | 24 - 440 VACrms | 24 - 528 VACrms |
| Blocking voltage | 600 V _p | 800 V _p |
| Zero voltage turn-on | ≤ 15 V | ≤ 15 V |
| Operational frequency range | 45 to 65 Hz | 45 to 65 Hz |
| Power factor | > 0.95 @ 400 VACrms | > 0.95 @ 480 VACrms |
| CE-Marking | Yes | Yes |
| UKCA-Marking | Yes | Yes |
| Approvals | UR, cUR, EAC | UR, cUR, EAC |
| Pollution degree | 2 | 2 |

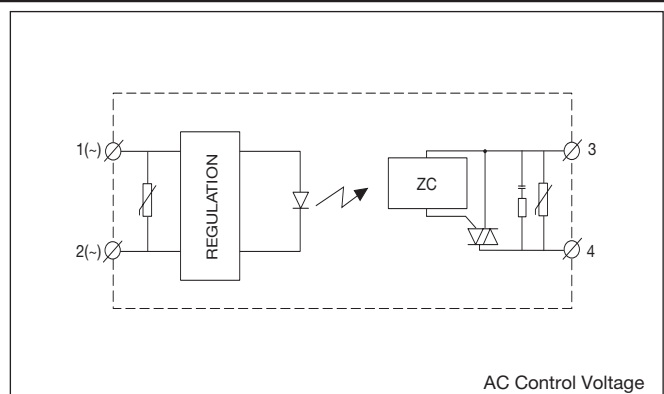
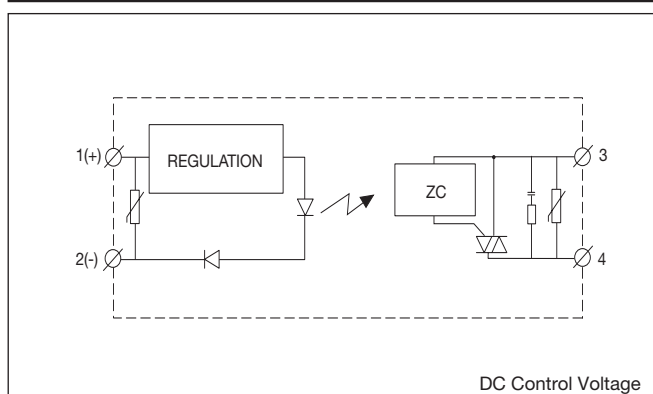
Input Specifications

| | RS1A..D..E | RS1A..A..E |
|-----------------------------------|-------------|--------------|
| Control voltage | 3 - 32 VDC | 80 - 250 VAC |
| Pick-up voltage | 3 VDC | 70 VAC |
| Reverse voltage | ≤ 32 VDC | - |
| Drop out voltage | 1.2 VDC | 15 VAC |
| Input Current @ max input voltage | ≤ 13 mA | ≤ 10 mA |
| Response time pick up | ≤ 1/2 cycle | ≤ 1 cycle |
| Response time drop-out | ≤ 1/2 cycle | ≤ 2 cycle |

Output Specifications

| | RS1A...25E | RS1A...40E |
|--|------------------------|------------------------|
| Rated operational current AC51 @ Ta=25°C | 25 Arms | 40 Arms |
| Min. operational current | 250 mArms | 400 mArms |
| Non-rep. surge current t=20 ms | 175 A _p | 280 A _p |
| Off-state leakage current @ rated voltage and frequency | < 2 mArms | < 2 mArms |
| I ² t for fusing t=10 ms | ≤ 215 A ² s | ≤ 560 A ² s |
| On-state voltage drop @ rated current | ≤ 1.6 Vrms | ≤ 1.6 Vrms |
| Critical dV/dt off-state | ≥ 1000 V/μs | ≥ 1000 V/μs |

Functional Diagram



Electromagnetic Compatibility

| | | | |
|--|--|---|------------------------|
| Immunity | EN60947-4-3 | Radiated Radio Frequency Immunity | IEC/EN 61000-4-3 |
| Electrostatic Discharge (ESD) Immunity | IEC/EN 61000-4-2 | 10V/m, 80 - 1000 MHz | Performance Criteria 1 |
| Air discharge, 8kV | Performance Criteria 2 | 10V/m, 1.4 - 2.0GHz | Performance Criteria 1 |
| Contact, 4kV | Performance Criteria 2 | 3 V/m, 2.0 - 2.7GHz | Performance Criteria 1 |
| Electrical Fast Transient (Burst) Immunity | IEC/EN 61000-4-4 | Conducted Radio Frequency Immunity | IEC/EN 61000-4-6 |
| Output: 2kV, 5kHz | Performance Criteria 2 | 10V/m, 0.15 - 80 MHz | Performance Criteria 1 |
| Input: 1kV, 5kHz | Performance Criteria 2 | Voltage Dips Immunity | IEC/EN 61000-4-11 |
| Electrical Surge Immunity | IEC/EN 61000-4-5 | 0% for 0.5, 1 cycle | Performance Criteria 2 |
| Output, line to line, 1kV | Performance Criteria 2 | 40% for 10 cycles | Performance Criteria 2 |
| Output, line to earth, 1kV | Performance Criteria 2 | 70% for 25 cycles | Performance Criteria 2 |
| Output, line to earth, 2kV | Performance Criteria 2 with external suppression | 80% for 250 cycles | Performance Criteria 2 |
| Input, line to line, 1kV | Performance Criteria 2 | Voltage Interruptions Immunity | IEC/EN 61000-4-11 |
| Input, line to earth, 2kV | Performance Criteria 2 | 0% for 5000ms | Performance Criteria 2 |
| EMC Emission | EN60947-4-3 | Radio Interference Field Emission (Radiated) | IEC/EN 55011 |
| Radio Interference Voltage Emission (Conducted) | IEC/EN 55011 | 30 - 1000MHz | Class B |
| 0.15 - 30MHz | Class A (industrial) with filters IEC/EN 60947-4-3 Class A (no filtering needed up to 75AAC) | | |

Notes:

- Use of AC solid state relays may, according to the application and the load current, cause conducted radio interferences. Use of mains filters may be necessary for cases where the user must meet E.M.C requirements. The capacitor values given inside the filtering specification tables should be taken only as indications, the filter attenuation will depend on the final application.
- The control terminals A1, A2 (RS1..A) shall be supplied by a secondary circuit where power is limited by a transformer, rectifier, voltage divider, or similar device that derives power from a primary circuit, and where the short-circuit limit between conductors of the secondary circuit or between conductors and ground is 1500 VA or less. The short-circuit volt ampere limit is the product of the open circuit voltage and the short circuit ampere.
- Control input lines must be installed together to maintain products' susceptibility to Radio Frequency interference.
- Performance Criteria 1: No degradation of performance or loss of function is allowed when the product is operated as intended.
- Performance Criteria 2: During the test, degradation of performance or partial loss of function is allowed. However, when the test is complete the product should return operating as intended by itself.
- Performance Criteria 3: Temporary loss of function is allowed, provided the function can be restored by manual operation of the controls.

Heatsink Dimensions (load current versus ambient temperature)

RS..25E

| Load current [A] | Thermal resistance [K/W] | | | | | | Power dissipation [W] |
|------------------|--------------------------|------|------|------|------|------|-----------------------|
| | 20 | 30 | 40 | 50 | 60 | 70 | |
| 25.0 | 1.02 | 0.70 | 0.37 | 0.05 | - | - | 31 |
| 22.5 | 1.39 | 1.04 | 0.68 | 0.32 | - | - | 27.9 |
| 20.0 | 1.86 | 1.46 | 1.06 | 0.65 | 0.25 | - | 24.8 |
| 17.5 | 2.47 | 2.00 | 1.54 | 1.08 | 0.62 | 0.16 | 21.7 |
| 15.0 | 3.27 | 2.73 | 2.19 | 1.66 | 1.12 | 0.58 | 18.6 |
| 12.5 | 4.39 | 3.75 | 3.10 | 2.46 | 1.18 | 1.17 | 15.5 |
| 10.0 | 6.08 | 5.28 | 4.47 | 3.66 | 2.86 | 2.05 | 12.4 |
| 7.5 | 8.89 | 7.82 | 6.74 | 5.67 | 4.59 | 3.50 | 9.3 |
| 5.0 | 13.7 | 12.0 | 10.4 | 8.82 | 7.20 | 5.59 | 6.2 |
| 2.5 | - | - | - | 17.7 | 14.5 | 11.2 | 3.1 |

T_A
Ambient temp. [°C]

RS..40E

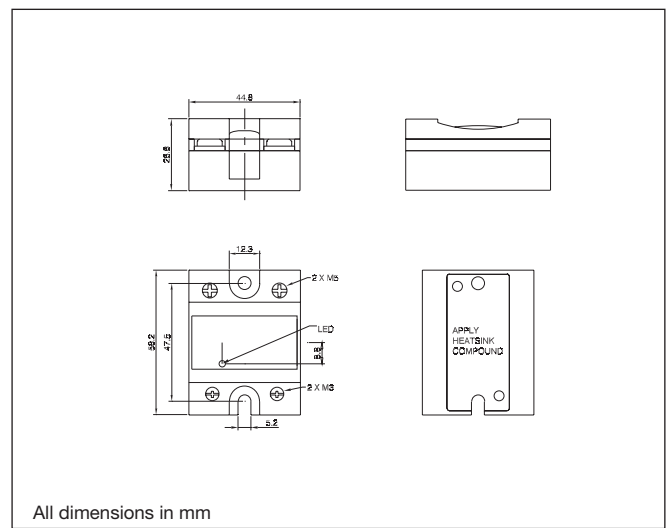
| Load current [A] | Thermal resistance [K/W] | | | | | | Power dissipation [W] |
|------------------|--------------------------|------|------|------|------|------|-----------------------|
| | 20 | 30 | 40 | 50 | 60 | 70 | |
| 40.0 | 0.36 | 0.16 | - | - | - | - | 50.5 |
| 36.0 | 0.60 | 0.38 | 0.16 | - | - | - | 45.5 |
| 32.0 | 0.89 | 0.65 | 0.40 | 0.15 | - | - | 40.4 |
| 28.0 | 1.27 | 0.99 | 0.71 | 0.43 | 0.14 | - | 35.4 |
| 24.0 | 1.78 | 1.45 | 1.12 | 0.79 | 0.46 | - | 30.3 |
| 20.0 | 2.50 | 2.10 | 1.70 | 1.31 | 0.91 | 0.28 | 25.3 |
| 16.0 | 3.56 | 3.07 | 2.57 | 2.08 | 1.58 | 0.80 | 20.2 |
| 12.0 | 5.34 | 4.68 | 4.02 | 3.36 | 2.71 | 1.66 | 15.2 |
| 8.0 | 8.36 | 7.37 | 6.38 | 5.39 | 4.40 | 3.39 | 10.1 |
| 4.0 | 16.8 | 14.8 | 12.8 | 10.8 | 8.85 | 6.87 | 5.1 |

T_A
Ambient temp. [°C]

Heatsink Selection

| Carlo Gavazzi Heatsink (see Accessories) | Thermal resistance... | ...for power dissipation |
|--|-----------------------|--------------------------|
| No heatsink required | --- | N/A |
| RHS 300 | 5.00 K/W | > 0 W |
| RHS 100 | 3.00 K/W | > 25 W |
| RHS 45C | 2.70 K/W | > 60 W |
| RHS 45B | 2.00 K/W | > 60 W |
| RHS 90A | 1.35 K/W | > 60 W |
| RHS 45A plus fan | 1.25 K/W | > 0 W |
| RHS 45B plus fan | 1.20 K/W | > 0 W |
| RHS 112A | 1.10 K/W | > 100 W |
| RHS 301 | 0.80 K/W | > 70 W |
| RHS 90A plus fan | 0.45 K/W | > 0 W |
| RHS 112A plus fan | 0.40 K/W | > 0 W |
| RHS 301 plus fan | 0.25 K/W | > 0 W |
| Consult your distribution | > 0.25 K/W | N/A |
| Infinite heatsink - No solution | --- | N/A |

Dimensions



Environmental Information

The declaration in this section is prepared in compliance with People's Republic of China Electronic Industry Standard SJ/T11364-2014: Marking for the Restricted Use of Hazardous Substances in Electronic and Electrical Products.

| Part Name | Toxic or Harardous Substances and Elements | | | | | |
|--|--|--------------|--------------|------------------------------|--------------------------------|---------------------------------------|
| | Lead (Pb) | Mercury (Hg) | Cadmium (Cd) | Hexavalent Chromium (Cr(VI)) | Polybrominated biphenyls (PBB) | Polybrominated diphenyl ethers (PBDE) |
| Power Unit Assembly | x | ○ | ○ | ○ | ○ | ○ |
| <p>O: Indicates that said hazardous substance contained in homogeneous materials for this part are below the limit requirement of GB/T 26572.</p> <p>X: Indicates that said hazardous substance contained in one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.</p> | | | | | | |

环境特性

这份申明根据中华人民共和国电子工业标准 SJ/T11364-2014：标注在电子电气产品中限定使用的有害物质

| 零件名称 | 有毒或有害物质与元素 | | | | | |
|--|------------|--------|--------|--------------|-------------|--------------|
| | 铅 (Pb) | 汞 (Hg) | 镉 (Cd) | 六价铬 (Cr(VI)) | 多溴化联苯 (PBB) | 多溴联苯醚 (PBDE) |
| 功率单元 | x | ○ | ○ | ○ | ○ | ○ |
| <p>O:此零件所有材料中含有的该有害物低于GB/T 26572的限定。</p> <p>X: 此零件某种材料中含有的该有害物高于GB/T 26572的限定。</p> | | | | | | |



FASTON terminals



- Faston tabs
- Tab dimensions according to DIN 46342 part 1
- Pure tin-plated brass

Ordering Key

Screw mounted Faston terminals

RS1A48D25E F 4*

RS, RM Solid State Relay
Faston terminals
Tab orientation

Input Tab width: 4.8mm
Output Tab width: 6.3mm

Faston terminals in packs of 20

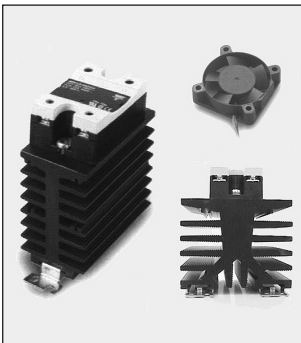
RM48 F4***

RS, RM Solid State Relay
Tab orientation

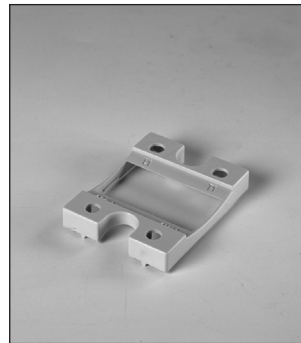
* 0: Flat (0°)
4: Angled (45°)

** 48: 4.8mm faston for input
63: 6.3mm faston for output

Other Accessories



- Heatsinks and fans
- Type RHS
- 0.25 to 5.00 k/W
- Single and dual relay types



- Touch safety cover
- Type RMIP20
- IP20 protection degree
- Pack size: 20 pieces

All accessories can be ordered pre-assembled with Solid State Relays.
Other accessories include DIN rail adaptors, fuses, varistors and spacers.
For further information refer to Accessories datasheets.

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