

Solid State Relays SOLITRON MIDI - With Integrated Heatsink Types RJ1A, RJ1B

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- AC semiconductor contactor
- Zero switching (RJ1A) or instant-on switching (RJ1B)
- Direct copper bonding (DCB) technology
- LED-indication
- Cage clamp output terminals
- 2 input ranges: 4-32 VDC and 24-275 VAC/24-48VDC
- Operational ratings up to 75 AACrms and 600 VAC¹
- Non-repetitive voltage: Up to 1200 Vp
- Opto-isolation > 4000 VACrms
- Over-temperature safety option²
- Integrated fan option

Product Description

The SOLITRON Midi is a single-phase Solid State Contactor designed to replace electro-mechanical contactors in industrial heating and motor applications, especially when switching is frequent. The product is ready to mount on DIN-rail or chassis and comes with integral heatsink. For current rating of 75AACrms (AC1) convection cooling is used. The standard housing dimensions enable straightforward replacement of alternative

products and the terminal layout allows both contactor (E) and SSR (U) type connection. Cage clamp terminals are used to ensure secure load connection with cable up to 25mm².

An LED indicates the status of the control input. The superior heat-transfer efficiency combined with a robust power management system make this a high reliability product that can meet the most stringent functional requirements.

Ordering Key

RJ 1 A 60 D 50 E P

Solid State Relay _____
Number of poles _____
Switching mode _____
Rated operational voltage _____
Control voltage _____
Rated operational current _____
Terminal Layout _____
Options _____

Type Selection

| Switching mode | Rated operational voltage ¹ | Control voltage | Rated operational current | Terminal Layout | Options |
|--|--|---|--|------------------------|---|
| A: Zero switching B: Instant-on switching | 23: 230 VACrms 60: 600 VACrms | D: 4-32 VDC A: 24-275 VAC 24-48 VDC | 45: 45 AACrms 50: 50 AACrms 75: 75 AACrms* | U: SSR E: Contactor | P: Over-temperature protection ² |

* With integrated fan and over-temperature protection

Selection Guide

| Rated operational voltage | Non-rep. voltage | Control voltage | Rated operational current | | |
|---------------------------|---------------------|----------------------------|---------------------------|--------------------------|------------------------------|
| | | | 45 A | 50 A | 75 A* (FAN+OTP) ² |
| 230 VACrms | 650 V _p | 4 - 32 VDC | RJ1A23D45E RJ1A23D45U | RJ1A23D50E RJ1A23D50U | RJ1A23D75EP |
| | | 24 - 275 VAC / 24 - 48 VDC | RJ1A23A45E RJ1A23A45U | RJ1A23A50E RJ1A23A50U | RJ1A23A75EP |
| | | | | | |
| 600 VACrms | 1200 V _p | 4 - 32 VDC | RJ1A60D45E RJ1A60D45U | RJ1A60D50E RJ1A60D50U | RJ1A60D75EP |
| | | 24 - 275 VAC / 24 - 48 VDC | RJ1A60A45E RJ1A60A45U | RJ1A60A50E RJ1A60A50U | RJ1A60A75EP |
| | | | | | |

*With integrated fan and over-temperature protection

Notes

- 1 690 VACrms rated operational voltage available on request. Example: RJ1A69D45U
- 2 "P" suffix: Over-temperature protection (OTP), available with type "E" terminals only

General Specifications

| | RJ1.23.. | RJ1.60.. |
|-----------------------------|--------------------|---------------------|
| Operational voltage range | 24 to 265 VAC | 42 to 660 VAC |
| 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 @ 600 VACrms |
| Over-temperature alarm | | |
| I _{max} | 50mADC | 50mADC |
| U _{max} | 50VDC | 50VDC |
| Approvals | UL, cUL, CSA* | UL, cUL, CSA* |
| CE-marking | Yes | Yes |

* Approvals pending

Input Specifications

| | RJ1A...D | RJ1B..D | RJ1A...A |
|------------------------|------------|--------------|------------------------|
| Control voltage range | 4 - 32 VDC | 4.5 - 32 VDC | 24-275 VAC/24 - 48 VDC |
| Pick-up voltage | 3.8 VDC | 4.25 VDC | 22 VAC/DC |
| Reverse voltage | 32 VDC | 32 VDC | n/a |
| Drop-out voltage | 1.2 VDC | 1.0 VDC | 6 VAC/DC |
| Maximum input current | 12 mA | 15 mA | 17 mA |
| Response time pick-up | 1 cycle | 1 ms | 1 cycle |
| Response time drop-out | 1 cycle | 1 cycle | 1 cycle |

Output Specifications

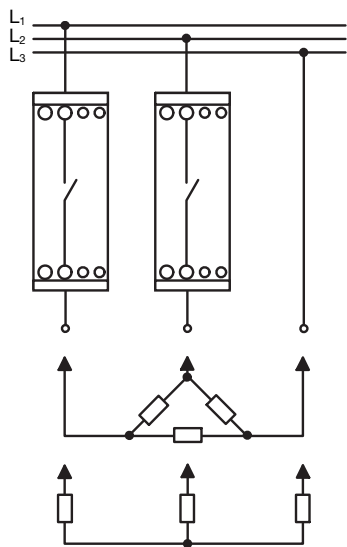
| | RJ..45 | RJ..50 | RJ..75 (With integrated fan) |
|--|------------------------|------------------------|---------------------------------|
| Rated operational current AC51 @Ta=25°C AC53a @Ta=25°C | 45 AACrms 20 AACrms | 50 AACrms 30 AACrms | 75 AACrms 30 AACrms |
| Min. operational current | 150 mAACrms | 150mAACrms | 150mAACrms |
| Rep. overload current t = 1s | < 150 AACrms | <200 AACrms | <200 AACrms |
| Non rep. surge current Tj(init.) = 25°C and t = 10 ms | 1150 Ap | 1900 Ap | 1900 Ap |
| Off-state leakage current @ rated voltage and frequency | < 3 mArms | < 3 mArms | < 3 mArms |
| I ² t for fusing t = 10 ms | 6600 A²s | 18000 A²s | 18000 A²s |
| Critical di/dt | ≥ 150 A/μs | ≥ 150 A/μs | ≥ 150 A/μs |
| On-state voltage drop @ rated current | 1.6 Vrms | 1.6 Vrms | 1.6 Vrms |
| Critical dv/dt commutating | 500 V/μs | 500 V/μs | 500 V/μs |
| Critical dV/dt off-state | 500 V/μs | 500 V/μs | 500 V/μs |

Thermal Specifications

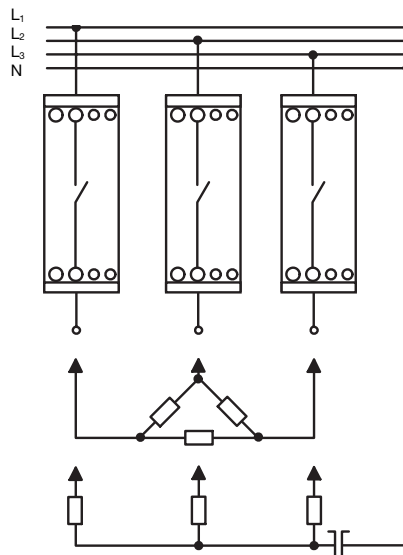
| | RJ...D | RJ...A |
|-----------------------|---------------|---------------|
| Operating temperature | -30 to +70°C | -30 to +70°C |
| Storage temperature | -40 to +100°C | -40 to +100°C |
| Junction temperature | 125°C | 125°C |

Applications

Two single pole relays in 3-phase application
Delta and star.
(Economy Switch)

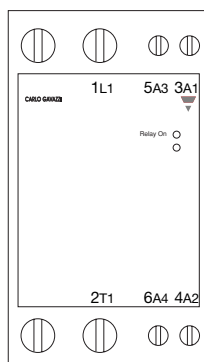


3 single pole relays in
3-phase application
Delta, Star, Star with neutral



Terminal Layout

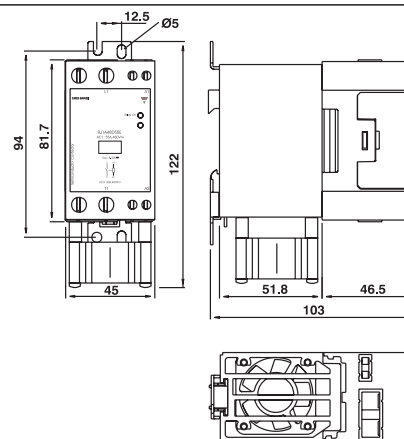
RJ1A.....E



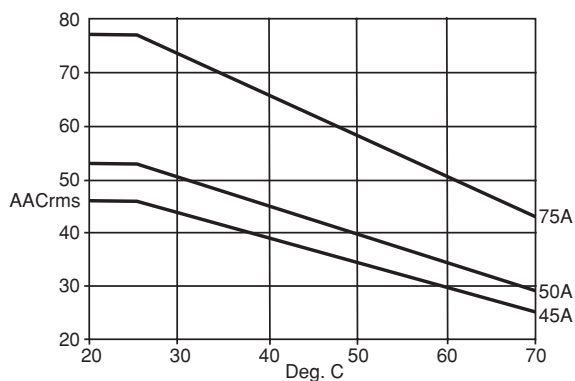
RJ1A.....U



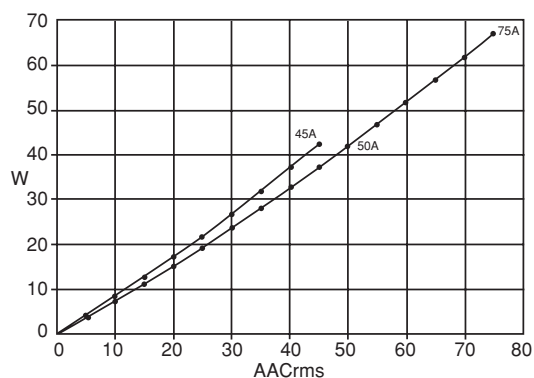
Dimensions



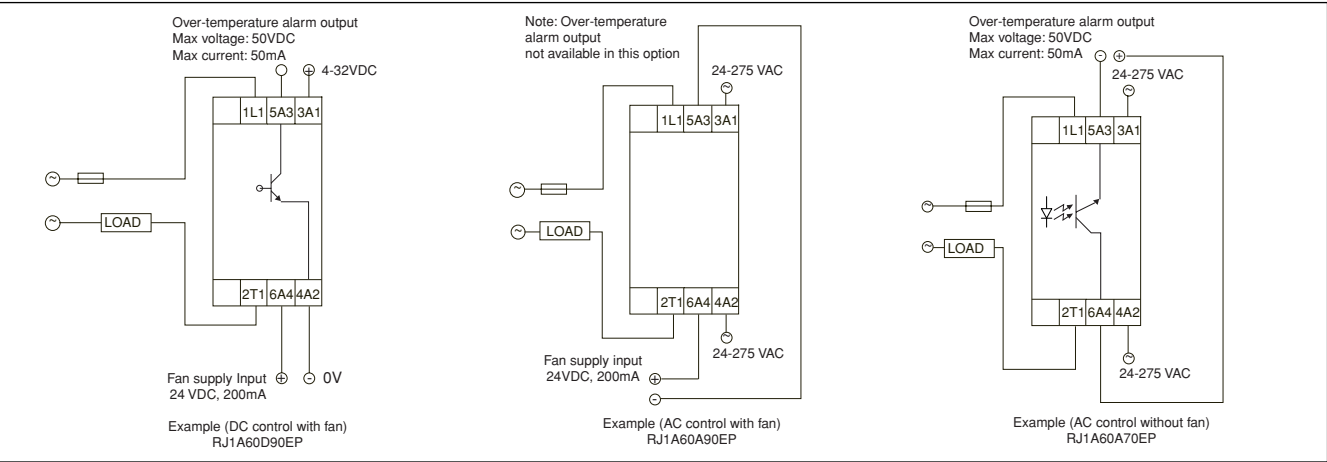
Derating Curve



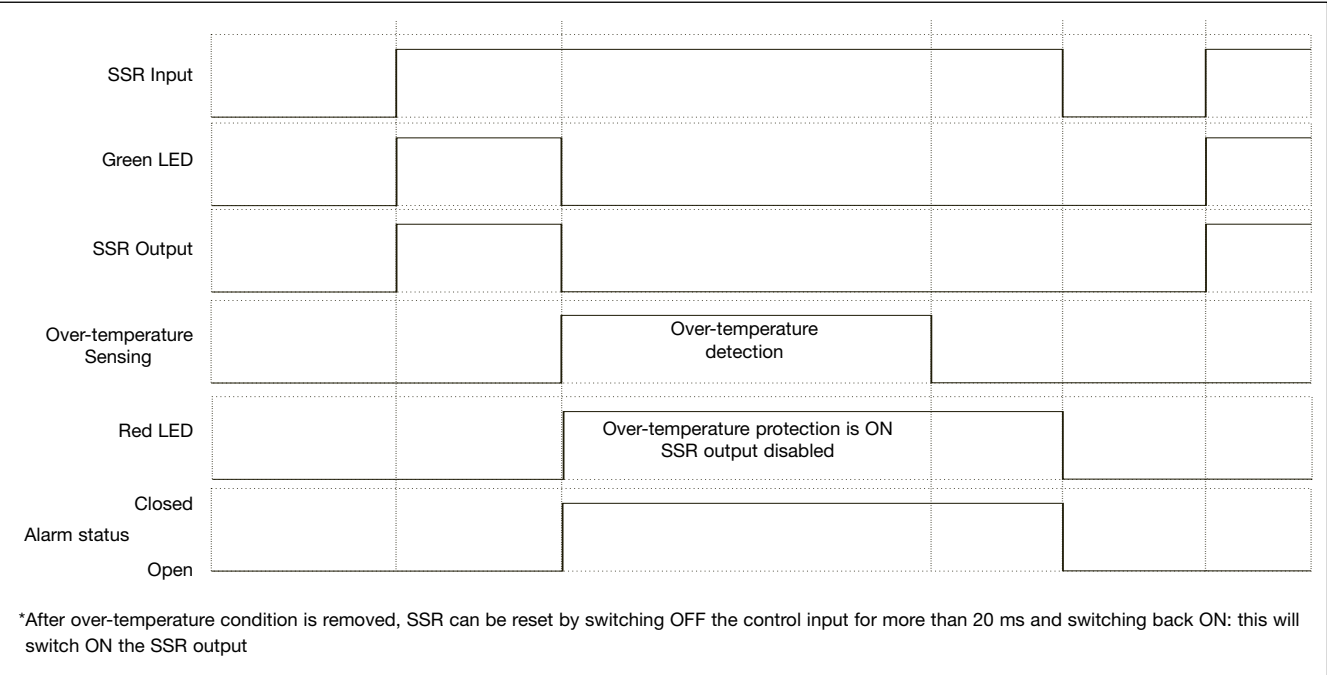
Dissipation Curve



Connection Examples



Over-temperature Protection (Option: ...P)



Housing Specifications

| | |
|-----------------------------|---|
| Weight | Approx. 360 g |
| Housing material | PBT FR |
| Control terminal cable size | |
| Min | 1 x 0.5 mm ² (1 x AWG20) |
| Max | 1 x 4.0 mm ² (1 x AWG12) or 2 x 2.5 mm ² (2 x AWG14) |
| Mounting torque max. | 0.6 Nm |
| Power terminal cable size | |
| Min | 1 x 4 mm ² (1 x AWG12) |
| Max | 1 x 25 mm ² (1 x AWG3) or 2 x 10 mm ² (2 x AWG6) |
| Mounting torque max. | 2.5 Nm |

Insulation

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