



SERIES 1 | 120 VAC
PANEL MOUNT



Features

- Ratings from 10A to 40A @ 24-140 VAC
- SCR output for heavy industrial loads
- Zero voltage or instantaneous turn-on outputs
- UL/CSA/TUV Approved, CE Compliant to EN60950-1
- Improved SEMS screw and washer
- Redesigned housing with anti-rotation barriers
- AC or DC control
- Direct bond copper substrate
- EMC compliant to Level 3
- Direct power lead frame
- Epoxy free design

PRODUCT SELECTION

| Control Voltage | 10A | 25A | 40A |
|-----------------|--------|--------|--------|
| 3-32 VDC | D1210 | D1225 | D1240 |
| 90-280 VAC | A1210 | A1225 | A1240 |
| 18-36 VAC | A1210E | A1225E | A1240E |

ORDERING OPTIONS

A - **12** - **10** - **E** - **K** - **P** - **G** - **S** - **H** - **-10**

Control Voltage

A: 90-280 VAC
D: 3-32 VDC
AxxxxE: 18-36 VAC

Operating Voltage

12: 24-140 VAC

Rated Load Current

10: 10 Amps (1)
25: 25 Amps
40: 40 Amps (2)

Termination

Blank: Screw
F: Quick Connect (Up to 50 Amps only)
K: Hex standoffs (3)

Overvoltage Protection

Blank: Not Included
P: Included

Input Status LED

Blank: Not Included
G: Included

Snubber

Blank: Not Included
S: Included

Thermal Pad

Blank: Not Included
H: Included

Switching Type

Blank: Zero Voltage Turn-On
-10: Instantaneous Turn-On (4)

— Required for valid part number
□ For options only and not required for valid part number

Note: Not all part number combinations are available. Contact Crydom Technical support for information on the availability of a specific part number.

OUTPUT SPECIFICATIONS ⁽⁵⁾

| Description | 10A | 25A | 40A |
|--|---------|---------|-----------|
| Operating Voltage (47-440Hz) [Vrms] ⁽⁶⁾ | 24-140 | 24-140 | 24-140 |
| Transient Overvoltage [Vpk] | 600 | 600 | 600 |
| Maximum Off-State Leakage Current @ Rated Voltage [mA rms] ⁽⁷⁾ | 1 | 1 | 1 |
| Minimum Off-State dv/dt @ Maximum Rated Voltage [V/μsec] | 500 | 500 | 500 |
| Maximum Load Current [Arms] ⁽²⁾⁽⁸⁾ | 10 | 25 | 40 |
| Minimum Load Current [mA rms] | 150 | 150 | 150 |
| Maximum 1 Cycle Surge Current (50/60Hz) [A pk] | 115/120 | 239/250 | 597/625 |
| Maximum On-State Voltage Drop @ Rated Current [Vrms] | 1.15 | 1.15 | 1.15 |
| Thermal Resistance Junction to Case (Rjc) [°C/W] | 1.03 | 0.8 | 0.5 |
| Maximum 1/2 Cycle I ² t for Fusing (50/60Hz) [A ² sec] | 66/60 | 285/259 | 1770/1629 |
| Minimum Power Factor (at Maximum Load) ⁽³⁾ | 0.5 | 0.5 | 0.5 |

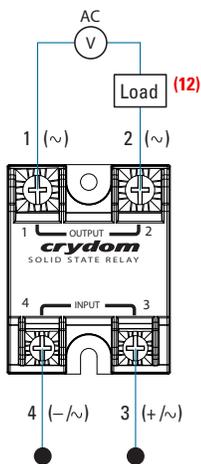
INPUT SPECIFICATIONS ⁽⁵⁾

| Description | D12xx | A12xx | A12xxE |
|--------------------------------|---------------------------|-------------------|------------|
| Control Voltage Range | 3-32 VDC | 90-280 Vrms | 18-36 Vrms |
| Maximum Reverse Voltage | -32 VDC | - | - |
| Minimum Turn-On Voltage | 3.0 VDC ⁽⁹⁾ | 90 Vrms | 18 Vrms |
| Must Turn-Off Voltage | 1.0 VDC | 10 Vrms | 4 Vrms |
| Minimum Input Current [mA] | 7 | 5 | 16 |
| Maximum Input Current [mA] | 12 | 10 | 20 |
| Nominal Input Impedance [Ohms] | | Current Regulated | |
| Maximum Turn-On Time [msec] | 1/2 Cycle ⁽¹⁰⁾ | 20 | 20 |
| Maximum Turn-Off Time [msec] | 1/2 Cycle | 30 | 30 |

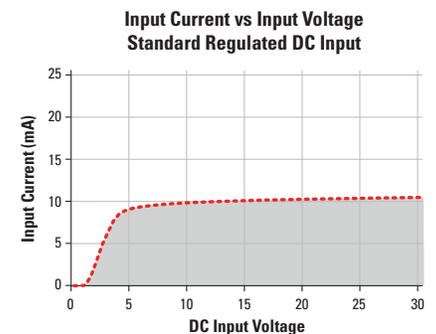
GENERAL SPECIFICATIONS ⁽⁵⁾

| Description | Parameters |
|---|--------------------------------|
| Dielectric Strength, Input/Output/Base (50/60Hz) | 4000 Vrms |
| Minimum Insulation Resistance (@ 500 VDC) | 10 ⁹ Ohm |
| Maximum Capacitance, Input/Output | 8 pF |
| Ambient Operating Temperature Range | -40 to 80 °C |
| Ambient Storage Temperature Range | -40 to 125 °C |
| Weight (typical) | 2.6 oz (74.9g) |
| Housing Material | UL 94 V-0 |
| Baseplate Material | Aluminum |
| Input Terminal Screw Torque Range (in-lb/Nm) | 13-15 / 1.5-1.7 |
| Load Terminal Screw Torque Range (in-lb/Nm) | 18-20 / 2.0-2.2 |
| SSR Mounting Screw Torque Range (in-lb/Nm) | 18-20 / 2.0-2.2 |
| Input/Load Terminal Screw Torque Range (in-lb/Nm) ⁽²⁾ | w/"K" option 8-10 / 0.9-1.13 |
| Input/Output Terminal Screw Thread Size | #6-32 UNC / #8-32 UNC |
| Humidity per IEC60068-2-78 | 93% non-condensing |
| LED Input Status Indicator | w/"G" option (green) |
| MTBF (Mean Time Between Failures) at 40°C ambient temperature ⁽¹¹⁾ | 11,641,553 hours (1,328 years) |
| MTBF (Mean Time Between Failures) at 60°C ambient temperature ⁽¹¹⁾ | 7,210,376 hours (823 years) |

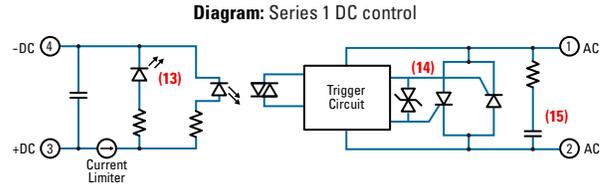
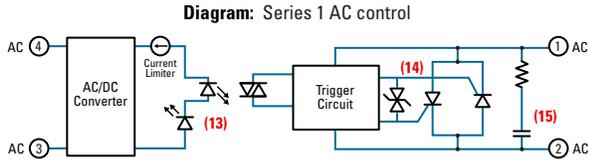
WIRING DIAGRAM



| Recommended Wire Sizes | | |
|------------------------|---|--------------------------------|
| Terminals | Wire Size (Solid / Stranded) | Wire Pull-Out Strength (lb)[N] |
| Input | 24 AWG (0.2 mm ²) / 0.2 [minimum] | 10 [44.5] |
| | 2 x 12 AWG (3.3 mm ²) / 3.3 [maximum] | 90 [400] |
| Output | 20 AWG (0.5 mm ²) / 0.518 [minimum] | 30 [133] |
| | 2 x 10 AWG (5.3 mm ²) / 5.3 | 110 [490] |
| | 2 x 8 AWG (8.4 mm ²) / 8.4 [maximum] | 90 [400] |



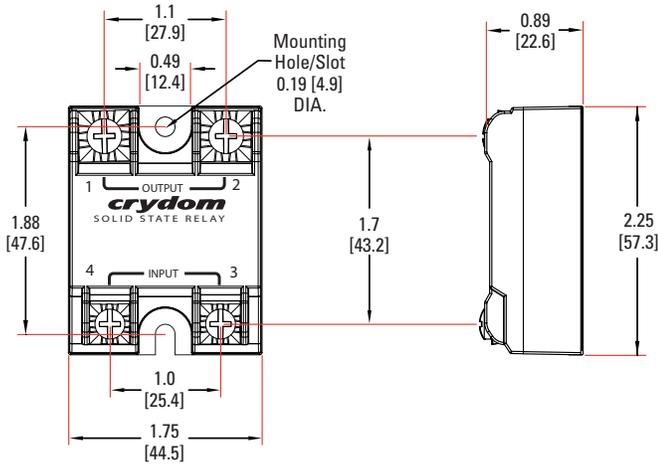
EQUIVALENT CIRCUIT BLOCK DIAGRAMS



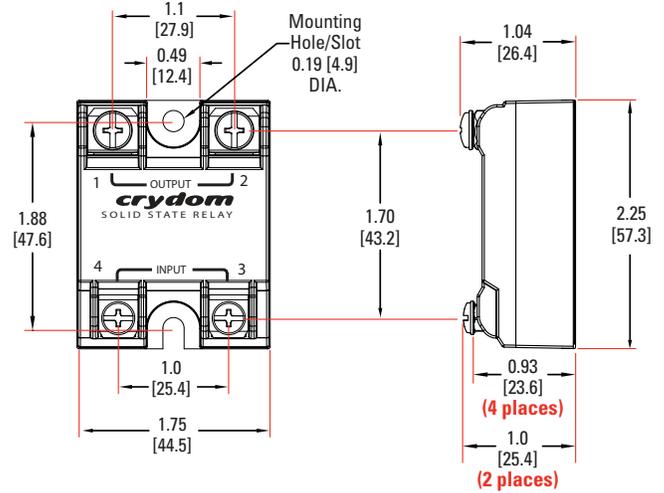
MECHANICAL SPECIFICATIONS (5)

Tolerances: ± 0.02 in / 0.5 mm
All dimensions are in: inches [millimeters]

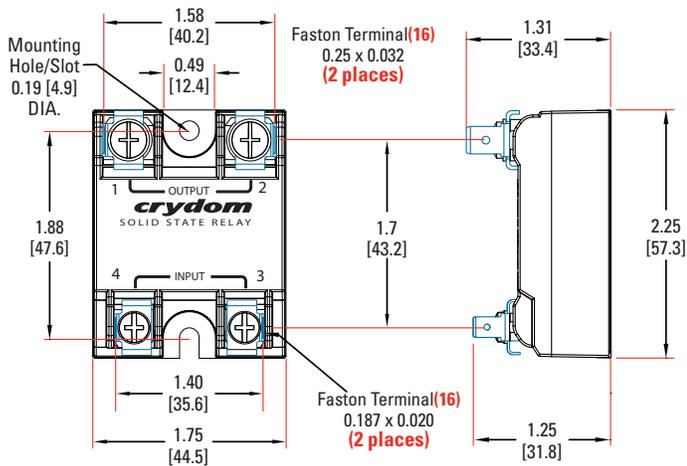
Screw Termination



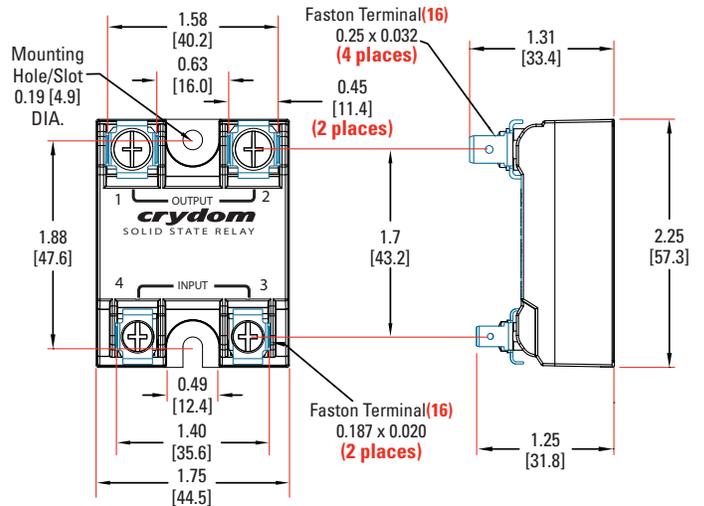
Hex Standoff Termination ("K" Option) (2)



Quick Connect Termination ("F" Option) - Up to 25 Amp (1)

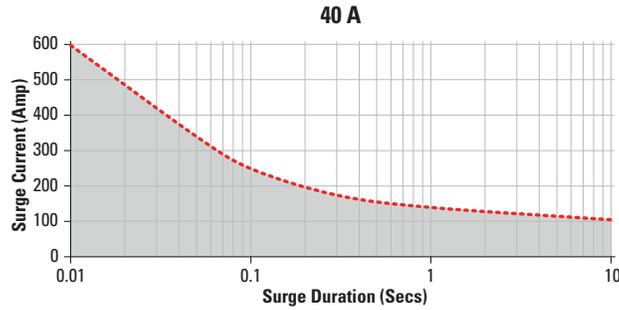
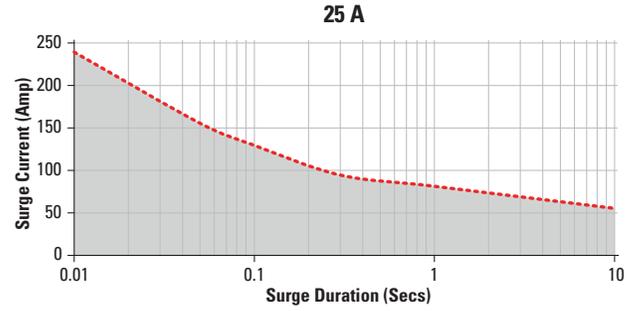
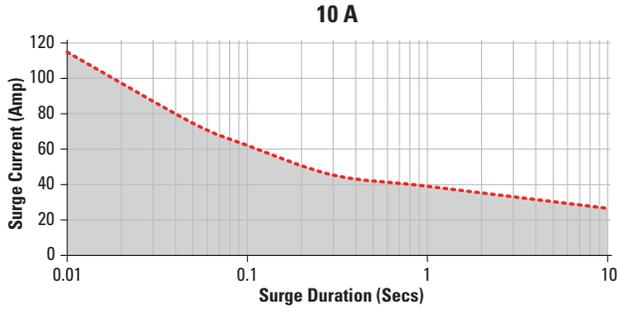


Quick Connect Termination ("F" Option) - Up to 50 Amp (1)





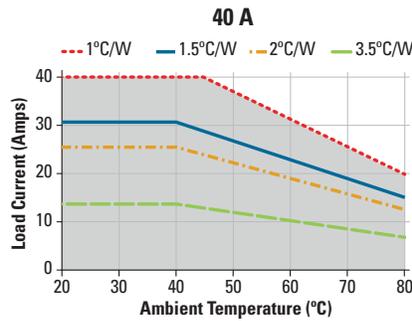
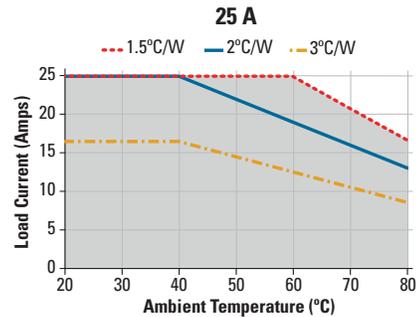
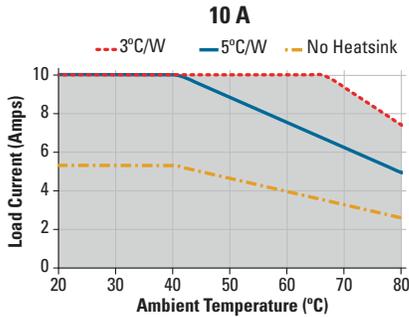
SURGE CURRENT INFORMATION



Non repetitive peak surge current at Tj initial 40°C.



THERMAL DERATE INFORMATION



AGENCY APPROVALS AND CERTIFICATIONS

EN60950 : Meets the requirements of sections 1.5: 1.7: 2.9: 2.10.5.3: 4.2: 4.5: 4.7:
 Designed in accordance with the requirements of IEC 62314
 IEC 61000-4-2 : Electrostatic Discharge – Level 3
 IEC 61000-4-4 : Electrically Fast Transients – Level 3
 IEC 61000-4-5 : Electrical Surges – Level 3
 IEC 60068-2-6 : Vibration 0.33mm and 0.75 mm Amplitude over 10-55 Hz
 IEC 60068-2-27 : Shock Resistance 15g/11ms



ACCESSORIES

New Accessories! Protective Cover & Hardware Kits

Protective Cover

Part number: KS101



Clear plastic cover compatible with all new S1 designs. Safety covers provide added protection from electric shock when installing or checking equipment.

Hardware Kit

Part number: HK4



Bag with 2 square brass accessories and 2 screw 8-32 x 5/8 for output. Used to mount TMR1 lug terminals.

| Recommended Accessories | | | | | |
|-------------------------|--------------|-----------------|---------------------------|--------------|-------------|
| Cover | Hardware Kit | Heat Sink | | Lug Terminal | Thermal Pad |
| | | Part No. | Thermal Resistance [°C/W] | | |
| KS101 | HK1 | HS501DR | 5.0 | TRM1 | HSP-1 |
| | | HS301 / HS301DR | 3.0 | | |
| | HK4 | HS251 | 2.5 | TRM6 | HSP-2 |
| | | HS202 / HS202DR | 2.0 | | |
| | | HS201 / HS201DR | 2.0 | | |
| | | HS172 | 1.7 | | |
| | | HS151 / HS151DR | 1.5 | | |
| | | HS122 / HS122DR | 1.2 | | |
| | | HS103 / HS103DR | 1.0 | | |
| | | HS101 | 1.0 | | |
| | | HS073 | 0.7 | | |
| | | HS072 | 0.7 | | |
| | | HS053 | 0.5 | | |
| | | HS033 | 0.36 | | |
| HS023 | 0.25 | | | | |

GENERAL NOTES

- (1) Single pair (up to 25A) Double pair* (up to 50A). *Caution: User must connect both pairs.
- (2) Option "K" is designed and tested for use with printed circuit boards or ring/fork terminals having a thickness between 0.031 and 0.093 inches (0.79 to 2.36 mm), and loads rated up to 50 Amps. For higher load currents, the "K" standoff temperature must not exceed 105°C. For additional application assistance please contact Crydom Technical Support.
- (3) Output will self trigger between 450-600Vpk, Min. power factor 0.7 or higher, not suitable for capacitive loads.
- (4) Instantaneous turn-on version is not recommended for capacitive loads. Use zero turn-on only.
- (5) All parameters at 25°C unless otherwise specified.
- (6) For "S" option, operating voltage frequency is 47-63Hz.
- (7) For parts with option "S" maximum leakage current is 10mA.
- (8) Heat sinking required, see derating curves.
- (9) Increase minimum voltage by 1V for operations from -20 to -40°C.
- (10) Turn-on time for instantaneous turn-on versions is 0.02 msec (DC control Models).
- (11) All parameters at 50% power rating and 100% duty cycle (contact Crydom tech support for detailed report).
- (12) Load can be wired to either SSR output terminal 1 or 2.
- (13) Elective Input Status LED, "G" option
- (14) Elective Overvoltage Protection, "P" option.
- (15) Elective Internal Snubber, "S" option.
- (16) Mechanical dimensions vary from G3 models.

For additional information or specific questions, contact Crydom Technical Support.



WARNINGS



RISK OF MATERIAL DAMAGE AND HOT ENCLOSURE

- The product's side panels may be hot, allow the product to cool before touching.
- Follow proper mounting instructions including torque values.
- Do not allow liquids or foreign objects to enter this product.

Failure to follow these instructions can result in serious injury, or equipment damage.



HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Disconnect all power before installing or working with this equipment.
- Verify all connections and replace all covers before turning on power.

Failure to follow these instructions will result in death or serious injury.

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