



## H1 SERIES | H12WD

PANEL MOUNT



### Features

- Ratings from 25A to 125A @ 48-660 VAC
- Low off-state leakage current (snubberless)
- SCR output for heavy industrial loads
- Zero Voltage or instantaneous turn-on outputs
- UL/CSA/VDE Approved, CE Compliant to EN60950-1
- Improved SEMS screw and washer
- Redesigned housing with anti-rotation barriers
- DC control
- Direct bond copper substrate
- EMC Compliant to Level 3
- Direct power lead frame
- Epoxy free design

For **Generation 3** datasheet [click here](#)



### PRODUCT SELECTION

| Control Voltage | 25A       | 50A       | 75A       | 90A       | 125A       |
|-----------------|-----------|-----------|-----------|-----------|------------|
| 4-32 VDC        | H12WD4825 | H12WD4850 | H12WD4875 | H12WD4890 | H12WD48125 |



### ORDERING OPTIONS

|                                                                                                           |           |            |           |           |          |          |          |          |            |
|-----------------------------------------------------------------------------------------------------------|-----------|------------|-----------|-----------|----------|----------|----------|----------|------------|
|                                                                                                           | <b>H1</b> | <b>2WD</b> | <b>48</b> | <b>25</b> | <b>K</b> | <b>P</b> | <b>G</b> | <b>H</b> | <b>-10</b> |
| Series                                                                                                    |           |            |           |           |          |          |          |          |            |
| <b>H1</b>                                                                                                 |           |            |           |           |          |          |          |          |            |
| Transient Overvoltage                                                                                     |           |            |           |           |          |          |          |          |            |
| <b>2WD</b> : 1200 Vpk                                                                                     |           |            |           |           |          |          |          |          |            |
| Operating Voltage                                                                                         |           |            |           |           |          |          |          |          |            |
| <b>48</b> : 48-660 VAC                                                                                    |           |            |           |           |          |          |          |          |            |
| Rated Load Current                                                                                        |           |            |           |           |          |          |          |          |            |
| <b>25</b> : 25 Amps<br><b>50</b> : 50 Amps<br><b>75</b> : 75 Amps                                         |           |            |           |           |          |          |          |          |            |
| <b>90</b> : 90 Amps<br><b>125</b> : 125 Amps                                                              |           |            |           |           |          |          |          |          |            |
| Termination                                                                                               |           |            |           |           |          |          |          |          |            |
| <b>Blank</b> : Screw<br><b>F</b> : Quick Connect (Up to 50 Amps only) (1)<br><b>K</b> : Hex standoffs (2) |           |            |           |           |          |          |          |          |            |
| Overvoltage Protection                                                                                    |           |            |           |           |          |          |          |          |            |
| <b>Blank</b> : Not Included<br><b>P</b> : Included (3)                                                    |           |            |           |           |          |          |          |          |            |
| Input Status LED                                                                                          |           |            |           |           |          |          |          |          |            |
| <b>Blank</b> : Not Included<br><b>G</b> : Included                                                        |           |            |           |           |          |          |          |          |            |
| Thermal Pad                                                                                               |           |            |           |           |          |          |          |          |            |
| <b>Blank</b> : Not Included<br><b>H</b> : Included                                                        |           |            |           |           |          |          |          |          |            |
| Switching Type                                                                                            |           |            |           |           |          |          |          |          |            |
| <b>Blank</b> : Zero Voltage Turn-On<br><b>-10</b> : 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                                                                  | 25A     | 50A       | 75A       | 90A       | 125A        |
|------------------------------------------------------------------------------|---------|-----------|-----------|-----------|-------------|
| Operating Voltage (47-440Hz) [Vrms]                                          | 48-660  | 48-660    | 48-660    | 48-660    | 48-660      |
| Transient Overvoltage [Vpk]                                                  | 1200    | 1200      | 1200      | 1200      | 1200        |
| Maximum Off-State Leakage Current @ Rated Voltage [mArms]                    | 1.0     | 1.0       | 1.0       | 1.0       | 1.0         |
| Minimum Off-State dv/dt @ Maximum Rated Voltage [V/μsec]                     | 500     | 500       | 500       | 500       | 500         |
| Maximum Load Current [Arms] (6)(3)                                           | 25      | 50        | 75        | 90        | 125         |
| Minimum Load Current [mArms]                                                 | 150     | 150       | 150       | 150       | 150         |
| Maximum 1 Cycle Surge Current (50/60Hz) [Apk]                                | 239/250 | 597/625   | 954/1000  | 1145/1200 | 1670/1750   |
| Maximum On-State Voltage Drop @ Rated Current [Vrms]                         | 1.15    | 1.15      | 1.15      | 1.15      | 1.15        |
| Thermal Resistance Junction to Case (Rjc) [°C/W]                             | 0.8     | 0.45      | 0.3       | 0.27      | 0.22        |
| Maximum 1/2 Cycle I <sup>2</sup> t for Fusing (50/60Hz) [A <sup>2</sup> sec] | 285/259 | 1779/1621 | 4555/4150 | 6560/5976 | 13950/12709 |
| Minimum Power Factor (at Maximum Load) (7)                                   | 0.5     | 0.5       | 0.5       | 0.5       | 0.5         |

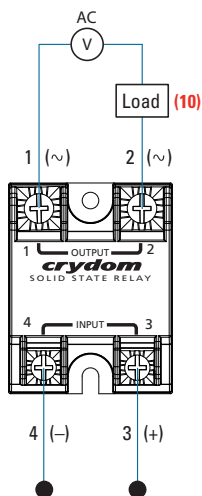
## INPUT SPECIFICATIONS (5)

| Description                     | DC Control        |
|---------------------------------|-------------------|
| Control Voltage Range           | 4-32 VDC          |
| Minimum Turn-On Voltage (7)     | 4.0 VDC           |
| Must Turn-Off Voltage           | 1.0 VDC           |
| Maximum Reverse voltage         | -32 VDC           |
| Minimum Input Current           | 7 mADC            |
| Maximum Input Current           | 12 mADC           |
| Nominal Input Impedance         | Current Regulated |
| Maximum Turn-On Time [msec] (8) | 1/2 Cycle         |
| Maximum Turn-Off Time [msec]    | 1/2 Cycle         |

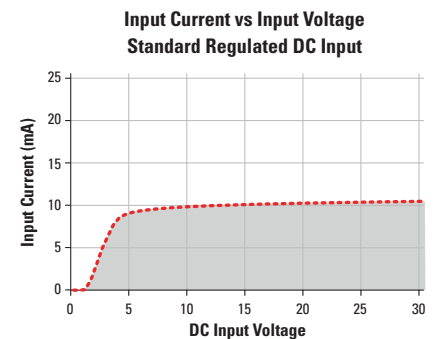
## GENERAL SPECIFICATIONS (5)

| Description                                                       | Parameters                     |
|-------------------------------------------------------------------|--------------------------------|
| Dielectric Strength, Input/Output/Base (50/60Hz)                  | 4000 Vrms                      |
| Minimum Insulation Resistance (@ 500 V DC)                        | 10 <sup>9</sup> 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 (74.9 g)                |
| Housing Material                                                  | 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) (3)             | 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 (9) | 11,641,553 hours (1,328 years) |
| MTBF (Mean Time Between Failures) at 60°C ambient temperature (9) | 7,210,376 hours (823 years)    |

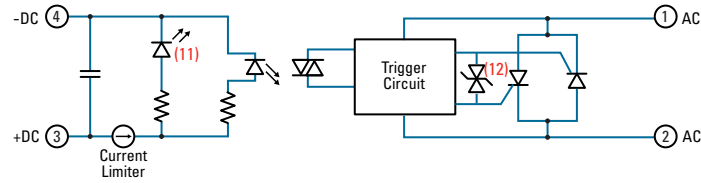
## WIRING DIAGRAM



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



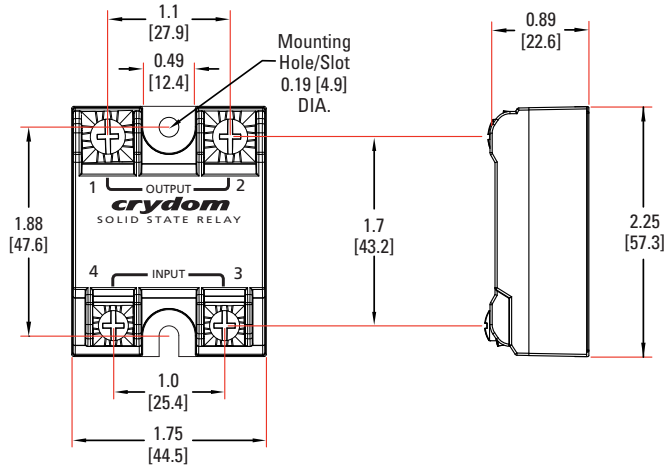
# EQUIVALENT CIRCUIT BLOCK DIAGRAM



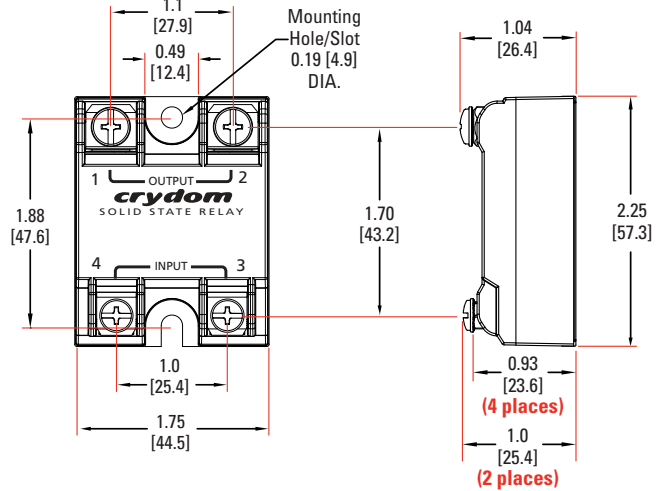
## MECHANICAL SPECIFICATIONS (5)

Tolerances:  $\pm 0.02$  in / 0.5 mm  
All dimensions are in: inches [millimeters]

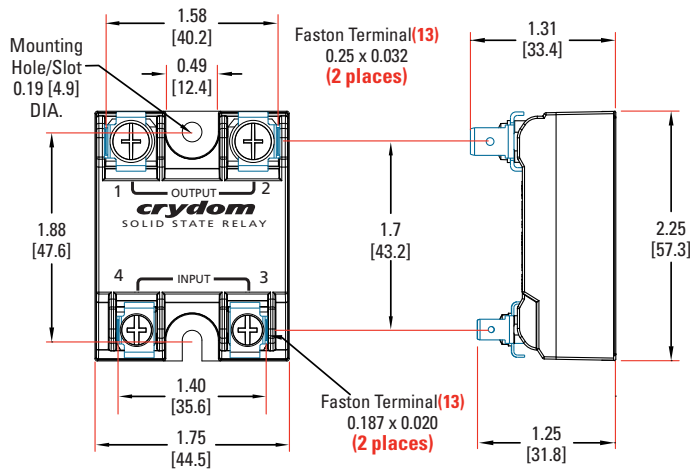
### Screw Termination



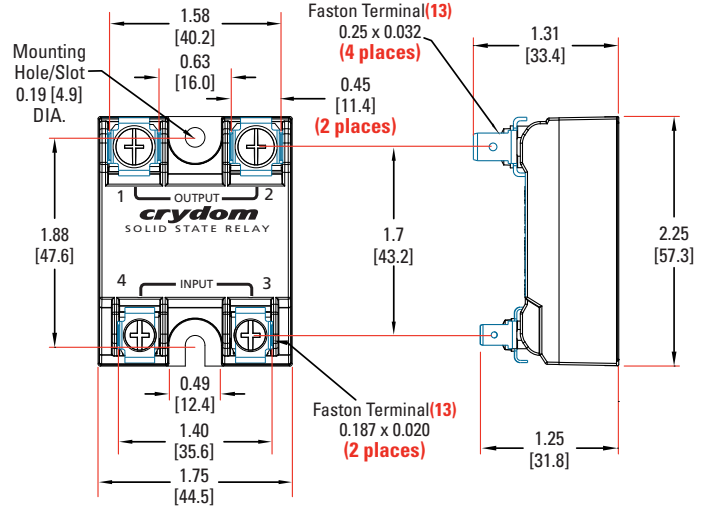
### Hex Standoff Termination ("K" Option) (3)



### Quick Connect Termination ("F" Option) - Up to 25 Amp (2)

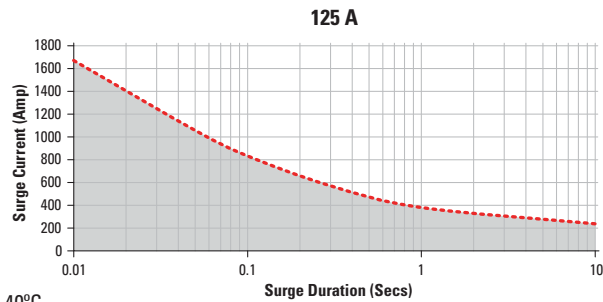
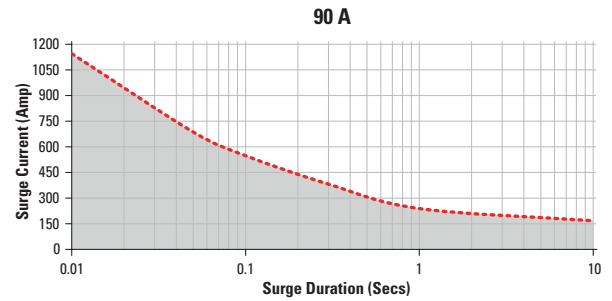
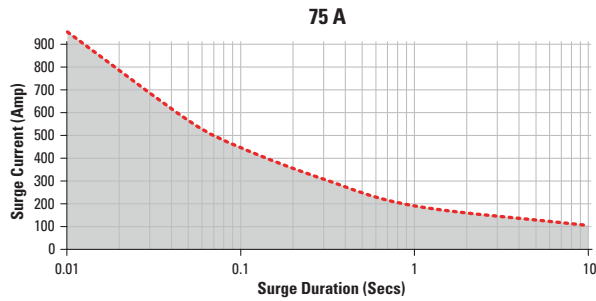
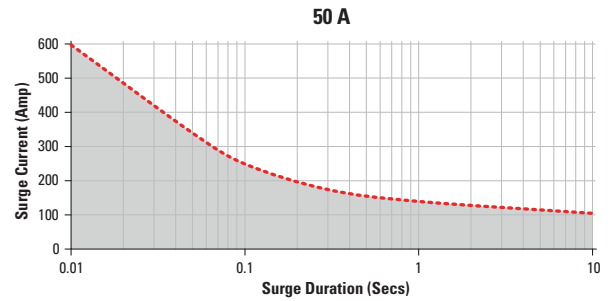
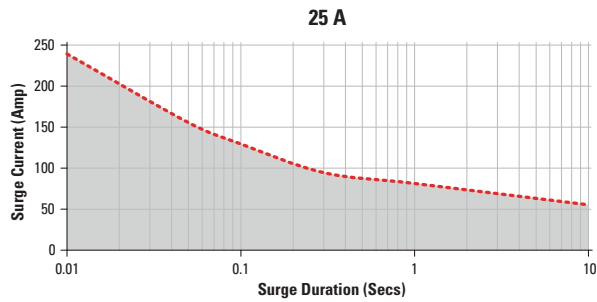


### Quick Connect Termination ("F" Option) - Up to 50 Amp (2)





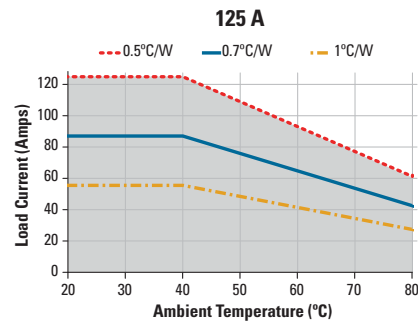
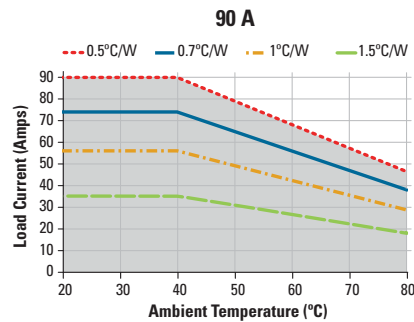
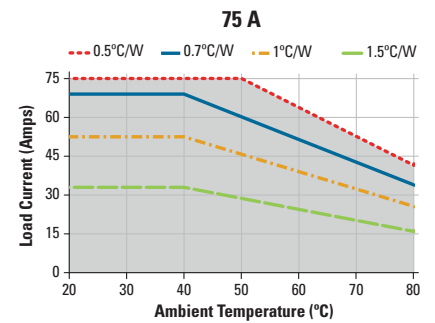
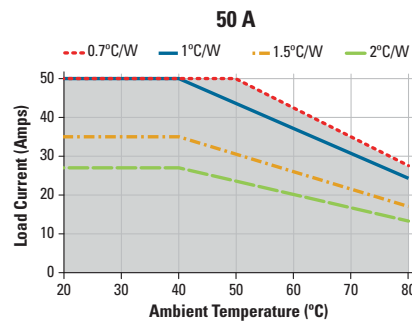
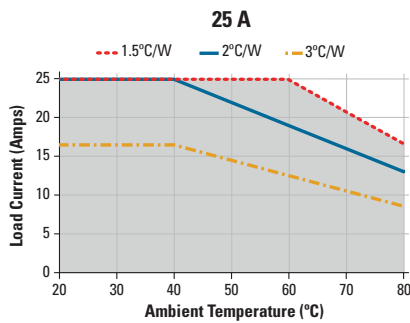
## SURGE CURRENT INFORMATION



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



## THERMAL DERATE INFORMATION



## AGENCY APPROVALS

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 0.75mm Amplitude over 10-55 Hz  
 IEC 60068-2-27: Shock Resistance 15g/11ms

**UL**® E116949 (25, 50, 75 and 90A)  
 E116950 (125A)

**SP**® LR81689

**VDE** 10143 UG

**CE**

**RoHS**

## ACCESORIES

### 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

| <br>Cover | <br>Hardware Kit |  |                           | <br>Lug Terminal | <br>Thermal Pad |
|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
|                                                                                            |                                                                                                   | Heat Sink Part No.                                                                  | Thermal Resistance [°C/W] |                                                                                                     |                                                                                                    |
| KS101                                                                                      | HK1<br>HK4                                                                                        | HS501DR                                                                             | 5.0                       | TRM1<br>TRM6                                                                                        | HSP-1                                                                                              |
|                                                                                            |                                                                                                   | HS301 / HS301DR                                                                     | 3.0                       |                                                                                                     | HSP-2                                                                                              |
|                                                                                            |                                                                                                   | HS251                                                                               | 2.5                       |                                                                                                     |                                                                                                    |
|                                                                                            |                                                                                                   | 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\* (50A model only). **\*Caution:** User must connect to 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 900-1200Vpk, 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) Heat sinking required, see derating curves.
- (7) Increase minimum voltage by 1V for operations from -20 to -40°C.
- (8) Turn-on time for Instantaneous turn-on versions is 0.02 msec.
- (9) All parameters at 50% power rating and 100% duty cycle (contact Crydom tech support for detailed report).
- (10) Load can be wired to either SSR output terminal 1 or 2.
- (11) Elective Input Status LED, "G" option.
- (12) Elective Overvoltage Protection, "P" option.
- (13) Mechanical dimensions vary from G3 models.

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



#### 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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