



CW SERIES | 240 VAC

PANEL MOUNT SOLID STATE RELAYS

The Sensata | Crydom CW Series Panel Mount AC output Solid State Relays offer a back-to-back SCR output for reliable switching of commercial and heavy industrial loads. This type of high performing SSR is available with output ratings from 10 Amps up to 125 Amps at 24 to 280 VAC. The CW Series panel mount solid state relay includes a removable IP20 “touch-safe” cover for added safety and is also available with zero voltage turn-on (for resistive loads) or instantaneous turn-on (for inductive loads) outputs.



Features

- Ratings from 10 A to 125 A @ 24-280 VAC
- SCR Output for heavy industrial loads
- LED Status Indicator
- UL/CSA/TUV Approved, CE Compliant to EN60950-1
- Improved SEMS screw and washer
- Redesigned housing with anti-rotation barriers
- AC or DC control and Universal AC/DC control
- EMC Compliant to Level 3
- Epoxy Free Design
- Removable IP20 touch-safe cover
- DBC substrate for superior thermal performance



PRODUCT SELECTION

| Control Voltage | 10 A | 25 A | 50 A | 90 A | 125 A |
|----------------------|----------|----------|----------|----------|-----------|
| 3-32 VDC | CWD2410 | CWD2425 | CWD2450 | CWD2490 | CWD24125 |
| 90-280 VAC | CWA2410 | CWA2425 | CWA2450 | CWA2490 | CWA24125 |
| 18-36 VAC | CWA2410E | CWA2425E | CWA2450E | CWA2490E | CWA24125E |
| 20-48 VDC/20-280 VAC | CWU2410 | CWU2425 | CWU2450 | CWU2490 | CWU24125 |



SPECIFICATIONS

Output ⁽¹⁾

| Description | 10 A | 25 A | 50 A | 90 A | 125 A |
|---|---------|-----------|-----------|-----------|-------------|
| Operating Voltage (47-440Hz) [Vrms] | 24-280 | 24-280 | 24-280 | 24-280 | 24-280 |
| Transient Overvoltage [Vpk] ⁽²⁾ | 600 | 600 | 600 | 600 | 600 |
| Maximum Off-State Leakage Current @ Rated Voltage [mArms] | 1 | 1 | 1 | 1 | 1 |
| Minimum Off-State dv/dt @ Maximum Rated Voltage [V/μsec] | 500 | 500 | 500 | 500 | 500 |
| Maximum Load Current [Arms] ⁽³⁾ | 10 | 25 | 50 | 90 | 125 |
| Minimum Load Current [Arms] | 150 | 150 | 150 | 250 | 250 |
| Maximum 1 Cycle Surge Current (50/60Hz) [Apk] | 380/400 | 570/600 | 810/850 | 1290/1350 | 1900/2000 |
| Maximum On-State Voltage Drop @ Rated Current [Vpk] | 1.3 | 1.3 | 1.3 | 1.3 | 1.25 |
| Thermal Resistance Junction to Case (Rjc) [°C/W] | 0.35 | 0.3 | 0.2 | 0.16 | 0.11 |
| Maximum 1/2 Cycle I ² t for Fusing (50/60Hz, 1/2 cycle) [A ² sec] | 720/660 | 1620/1500 | 3280/3000 | 8320/7560 | 18000/16600 |

| | | | | | |
|---|------------|-------------|----------|-----------|-----------|
| Minimum Power Factor (with Maximum Load) ⁽²⁾ | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| HP Rating UL 508/IEC60947 [-10 Option][HP (KW)]: 120 VAC | 0.5 (0.37) | 1 (0.74) | 2 (1.5) | 3 (2.24) | 5 (3.37) |
| HP Rating UL 508/IEC60947 [-10 Option][HP (KW)]: 240 VAC | 1.5 (1.1) | 3 (2.2) | 5 (3.73) | 7.5 (5.6) | 10 (7.5) |
| HP Rating UL 508/IEC60947 [HP (KW)]: 120 VAC | 0.5 (0.37) | 0.75 (0.56) | 1 (0.74) | 2 (1.5) | 3 (2.24) |
| HP Rating UL 508/IEC60947 [HP (KW)]: 240 VAC | 1.5 (1.1) | 2 (1.5) | 3 (2.2) | 5 (3.73) | 7.5 (5.6) |

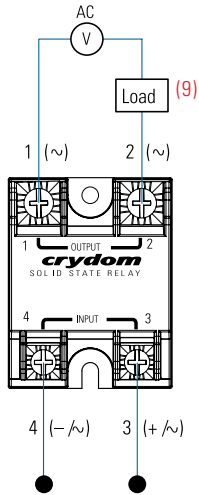
Input ⁽¹⁾

| Description | CWD | CWA | CWAxxxxE | CWU |
|---|--------------------------|---------------------------|-------------------|-----------------------|
| Control Voltage Range | 3-32 VDC | 90-280 VAC ⁽⁴⁾ | 18-36 VAC | 20-48 VDC/ 20-280 VAC |
| Maximum Reverse Voltage | -32 VDC | - | - | - |
| Minimum Turn-On Voltage | 3 VDC ⁽⁵⁾ | 90 VAC | 18 VAC | 19 VDC/VAC |
| Must Turn-Off Voltage | 1 VDC | 10 VAC | 4 VAC | 5 VDC/VAC |
| Minimum Input Current (for on-state) | 10 mA | 6 mA | 13 mA | 7/13 mA |
| Maximum Input Current | 15 mA | 10 mA | 15 mA | 11/9 mA |
| Nominal Input Impedance | Current Regulated | Current Regulated | Current Regulated | Current Regulated |
| Maximum Turn-On Time [msec] | 1/2 Cycle ⁽⁶⁾ | 20 | 20 | 20 |
| Maximum Turn-Off Time [msec] | 1/2 Cycle | 30 | 30 | 30 |

General ⁽¹⁾

| Description | Parameters |
|---|--------------------------------|
| Dielectric Strength, Input/Output/Base (50/60Hz) | 4000 Vrms |
| Minimum Insulation Resistance (@ 500 VDC) | 10 ⁹ Ohms |
| Maximum Capacitance, Input/Output | 8 pF |
| Ambient Operating Temperature Range ⁽⁷⁾ | -40 to 80 °C |
| Ambient Storage Temperature Range | -40 to 125 °C |
| Weight (typical) | 2.88 oz (81.53 g) |
| Housing Material | UL94 V-0 |
| Baseplate Material | Aluminum |
| Input Terminal Screw Torque Range (lb-in/Nm) | 13-15 / 1.5-1.7 |
| Load Terminal Screw Torque Range (lb-in/Nm) | 18-20 / 2-2.2 |
| SSR Mounting Screw Torque Range (lb-in/Nm) | 18-20 / 2-2.2 |
| Input/Output Terminal Screw Thread Size | #6-32 UNC / #8-32 UNC |
| Humidity per IEC60068-2-78 | 93% non-condensing |
| LED Input Status Indicator | Green |
| MTBF (Mean Time Between Failures) at 40°C ambient temperature ⁽⁸⁾ | 11,641,553 hours (1,328 years) |
| MTBF (Mean Time Between Failures) at 60°C ambient temperature ⁽⁸⁾ | 7,210,376 hours (823 years) |

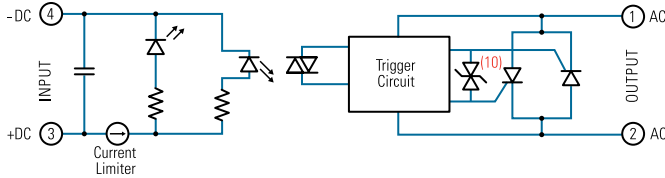
WIRING DIAGRAM



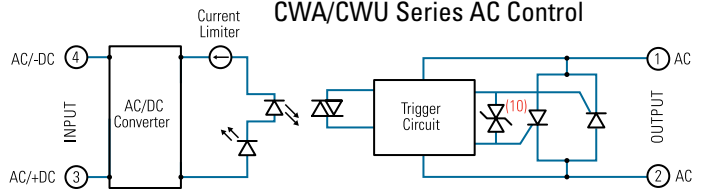
| Recommended Wire Sizes | | |
|------------------------|---|--------------------------------|
| Terminals | Wire Size (Solid / Stranded) | Wire Pull-Out Strength (lb)[N] |
| Input | 24 AWG (0.2 mm ²) / 0.2 [minimum] | 10 [44.5] |
| | 2 x 12 AWG (3.3 mm ²) / 3.3 [maximum] | 90 [400] |
| Output | 20 AWG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

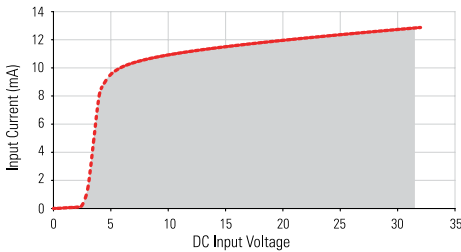
CWD Series DC Control



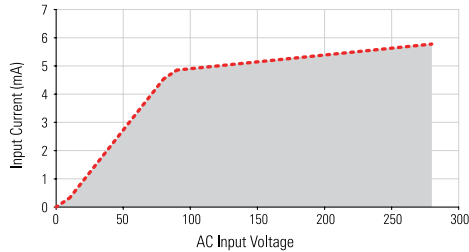
CWA/CWU Series AC Control



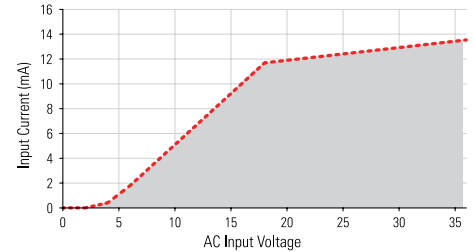
Input Current vs Input Voltage
Standard Regulated DC Input



Input Current vs Input Voltage
Standard Regulated AC Input



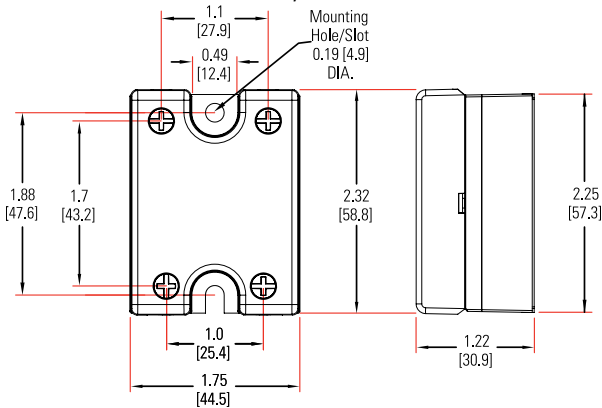
Input Current vs Input Voltage
Regulated AC Input Option "E"



MECHANICAL SPECIFICATIONS (1)

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

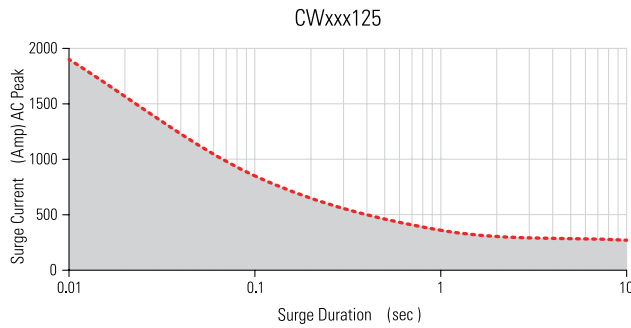
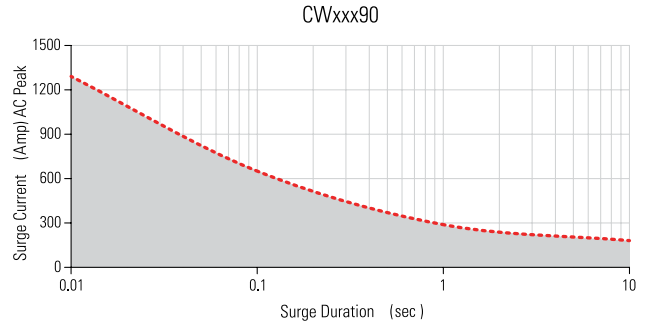
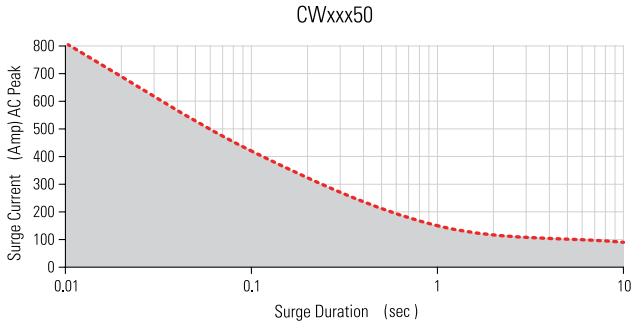
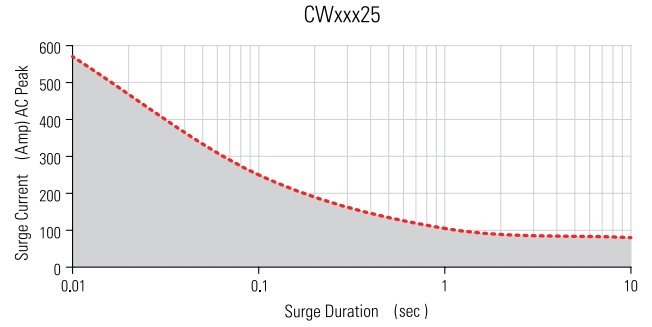
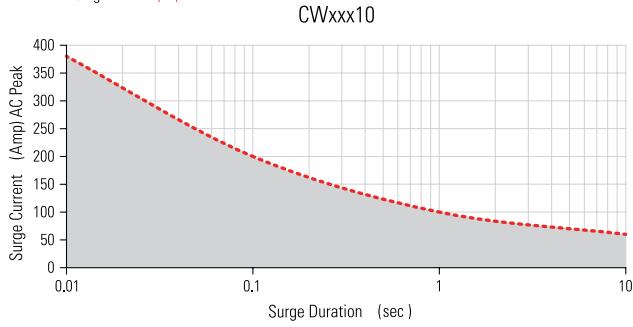
Screw Termination, IP20





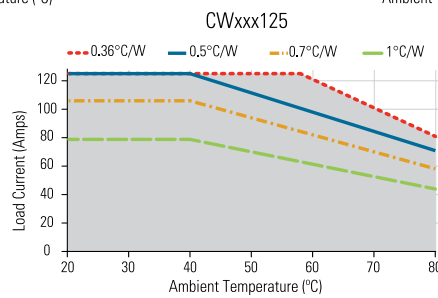
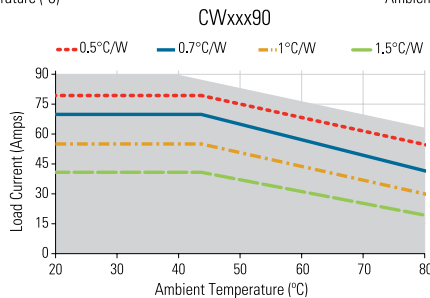
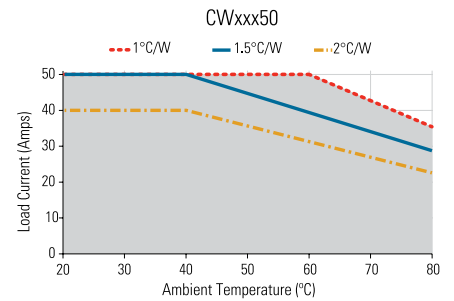
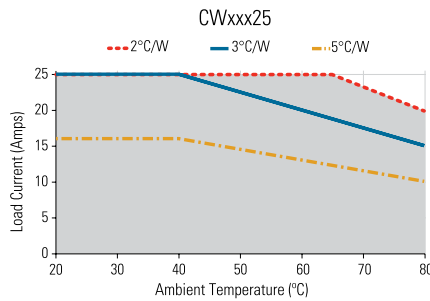
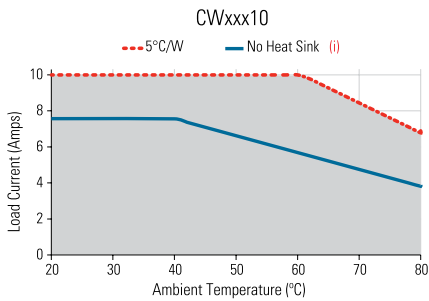
SURGE CURRENT INFORMATION

--- Single Pulse (11)



THERMAL DERATE INFORMATION

(i) SSR metal base plate acting as heat sink, it must be exposed to free ambient air.

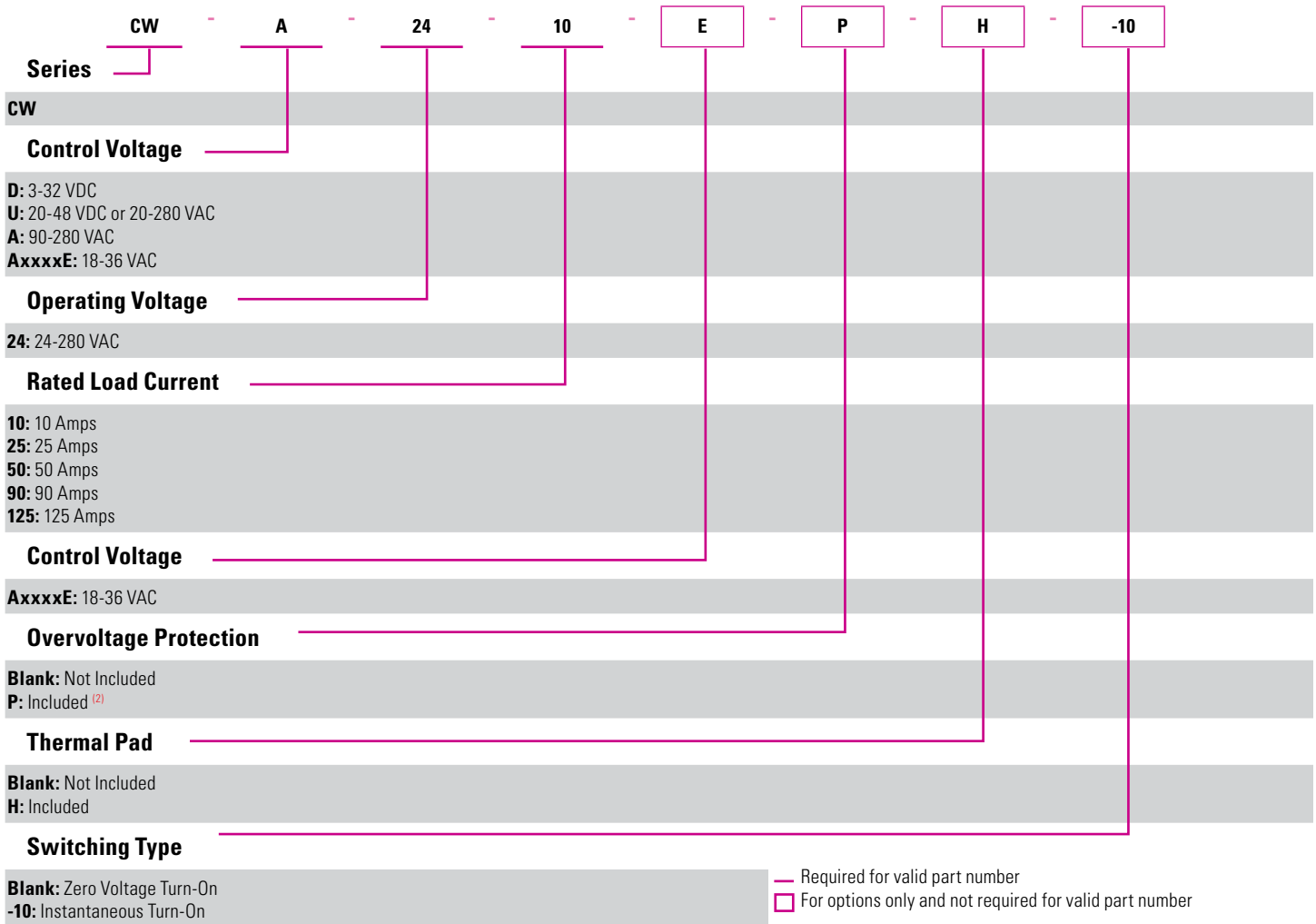




ORDERING OPTIONS

Example : CWA2410EPH-10

Not all part number combinations are available. Contact Technical Support for information on the availability of a specific part number.



GENERAL NOTES


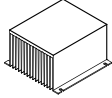
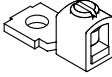
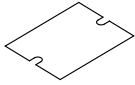
- ⁽¹⁾ All parameters at 25°C unless otherwise specified.
- ⁽²⁾ "P" option output will self trigger between 450-600 Vpk. Power factor 0.7 or higher, not suitable for capacitive loads.
- ⁽³⁾ Heat sinking required, see derating curves
- ⁽⁴⁾ For ambient temperature above 40°C the maximum control voltage must not exceed 250 VAC.
- ⁽⁵⁾ Increase minimum voltage by 1V for operations from -20 to -40°C.
- ⁽⁶⁾ Turn-on time for Instantaneous turn-on versions is 0.1 msec and 7msec for CWU models.
- ⁽⁷⁾ AC input models operating range is -20 to 80 °C.
- ⁽⁸⁾ All parameters at 50% power rating and 100% duty cycle (contact tech support for detailed report).
- ⁽⁹⁾ Load can be wired to either SSR output terminal 1 or 2.
- ⁽¹⁰⁾ Select P option for overvoltage protection.
- ⁽¹¹⁾ For single surge pulse Tc=25°C; Tj=125°C. For AC Output SSRs, AC Rms value of surge current equals the peak value divided by √2 (1.414).

For additional information or specific questions, contact Technical Support



ACCESSORIES

Recommended Accessories

|  Hardware Kit |  | |  Lug Terminal |  Thermal Pad |
|--|---|----------------------------------|--|---|
| | Heat Sink Part No. | Thermal Resistance [°C/W] | | |
| HK1 | HS501DR | 5.0 | TRM6 | HSP-1 HSP-2 |
| | HS301 / HS301DR | 3.0 | | |
| | HS251 | 2.5 | | |
| | HS201 / HS201DR | 2.0 | | |
| | HS202 / HS202DR | 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 | | |



AGENCY APPROVALS & CERTIFICATIONS

EN60950-1: Meets the requirements of sections 1.5: 1.7: 2.9: 2.10.5.3: 4.2: 4.5: 4.7:

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

Vibration Resistance: IEC 60068-2-6 : Amplitude Range 10-55 Hz, Displacement 0.75mm

Shock Resistance: IEC 60068-2-27 : Peak Acceleration 15g, Duration 11msec



**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 ARCH 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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