



## 1-DCL SERIES

PANEL MOUNT



### Features

- Ratings from 7 A to 40 A @ 200 VDC and from 7 A to 10 A @ 500VDC
- Mosfet Output
- UL Approved, CE Compliant to EN60950-1
- Improved SEMS screw and washer
- Redesigned housing with anti-rotation barriers
- DC control
- EMC Compliant to Level 3
- Epoxy Free Design



### PRODUCT SELECTION

Load Voltage	7 A	10 A	12 A	20 A	40 A
100 VDC	D1D07L		D1D12L	D1D20L	D1D40L
200 VDC	D2D07L		D2D12L		D2D40L
400 VDC	D4D07L		D4D12L		
500 VDC	D5D07L	D5D10L			



### SPECIFICATIONS

#### Output <sup>(2)</sup>

Description	7 A	12 A	20 A	40 A	7 A	12 A	40 A	7 A	12 A	7 A	10 A
Recommended Operating Voltage [Vdc]	1-72	1-72	1-72	1-72	1-150	1-150	1-150	1-300	1-300	1-385	1-385
Absolute Maximum Rating [Vdc]	100	100	100	100	200	200	200	400	400	500	500
Maximum Off-State Leakage Current @ Rated Voltage [mA]	0.1	0.2	0.3	0.3	0.1	0.3	0.3	0.3	0.3	0.2	0.3
Maximum Load Current [Adc] <sup>3</sup>	7	12	20	40	7	12	40	7	12	7	10
Minimum Load Current [mA] <sup>4</sup>	1	1	1	1	1	1	1	1	1	1	1
Maximum Surge Current (10msec) [Adc]	23	28	42	106	22	31	106	18	36	19	29
Maximum On-State Voltage Drop @ Rated Current [Vdc]	0.5	0.9	0.8	1	1.5	0.7	0.8	2.3	2.6	3.5	3.3
Maximum On-State Resistance [RDS-ON] [Ohms]	0.07	0.072	0.039	0.025	0.21	0.062	0.021	0.33	0.22	0.5	0.33
Thermal Resistance Junction to Case (Rjc) [°C/W]	2	2	1.71	0.68	1.24	0.71	0.22	0.56	0.39	0.6	0.43

<b>Minimum Heat Sink for Rated Current @ 40°C [°C/W]</b>	5	3	2	1	3	3	0.7	2	1	1	0.7
<b>Maximum Pulse Width Modulation Frequency [Hz]<sup>5</sup></b>	5000	4000	3500	2500	3500	2000	950	1200	900	1100	900

## Input <sup>(2)</sup>

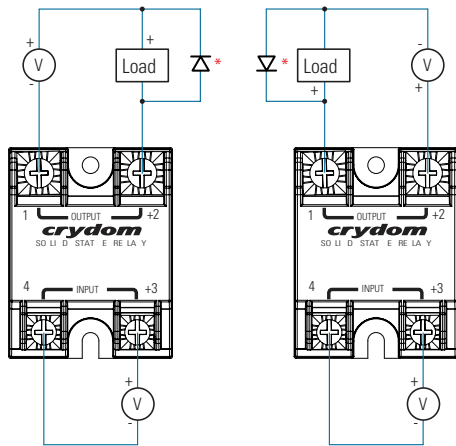
Description	DC Control
<b>Control Voltage Range</b>	3.5-32 VDC
<b>Maximum Reverse Voltage</b>	-32 VDC
<b>Minimum Turn-On Voltage<sup>6</sup></b>	3.5 VDC
<b>Must Turn-Off Voltage</b>	1 VDC
<b>Minimum Input Current (for on-state)</b>	10 mA
<b>Maximum Input Current</b>	15 mA
<b>Nominal Input Impedance</b>	Current Regulated
<b>Maximum Turn-On Time [µsec]</b>	100
<b>Maximum Turn-Off Time [µsec]</b>	100

## General <sup>(2)</sup>

Description	Parameters
<b>Dielectric Strength, Input/Output/Base (50/60Hz)</b>	3750 Vrms
<b>Minimum Insulation Resistance (@ 500 VDC)</b>	109 Ohms
<b>Maximum Capacitance, Input/Output</b>	8 pF
<b>Ambient Operating Temperature Range<sup>7</sup></b>	-40 to 100 °C
<b>Ambient Storage Temperature Range</b>	-40 to 125 °C
<b>Weight (typical)</b>	2.66 oz (75.5 g)
<b>Housing Material</b>	UL94 V-0
<b>Baseplate Material</b>	Aluminum
<b>Input Terminal Screw Torque Range (in-lb/Nm)</b>	13-15 / 1.5-1.7
<b>Load Terminal Screw Torque Range (in-lb/Nm)</b>	18-20 / 2-2.2
<b>SSR Mounting Screw Torque Range (in-lb/Nm)</b>	18-20 / 2-2.2
<b>Input/Load Terminal Screw Torque Range (in-lb/Nm)<sup>1</sup></b>	w/"K" option 8-10 / 0.9-1.13
<b>Input/Output Terminal Screw Thread Size</b>	#6-32 UNC / #8-32 UNC
<b>Humidity per IEC60068-2-78</b>	93% non-condensing
<b>MTBF (Mean Time Between Failures) at 40°C ambient temperature<sup>8</sup></b>	21,395,130 hours (2,441 years)
<b>MTBF (Mean Time Between Failures) at 60°C ambient temperature<sup>8</sup></b>	11,545,504 hours (1,317 years)

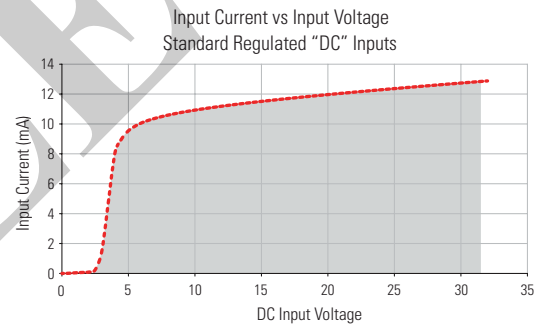
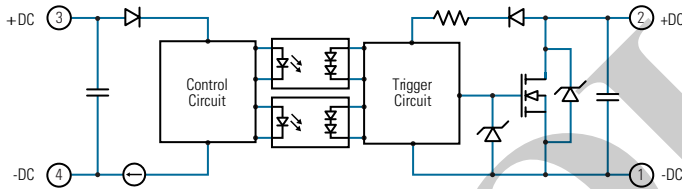
# WIRING DIAGRAM

\* Inductive loads must be diode suppressed.



Recommended Wire Sizes		
Terminals	Wire Size (Solid / Stranded)	Wire Pull-Out Strength (lbs)[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	110 [490]
	2 x 8 AWG (8.4 mm <sup>2</sup> ) / 8.4 [maximum]	90 [400]

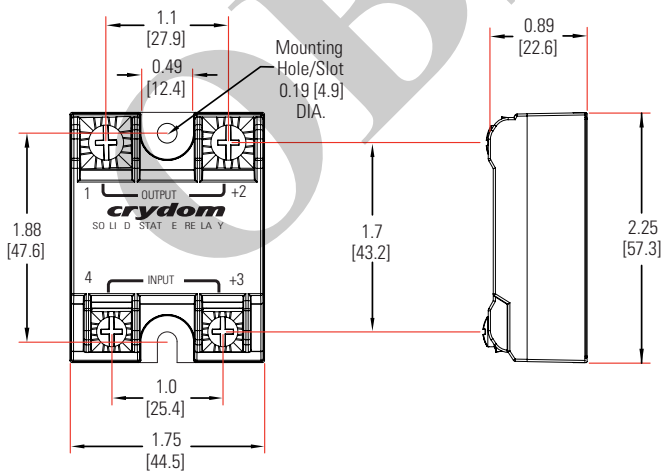
# EQUIVALENT CIRCUIT BLOCK DIAGRAMS



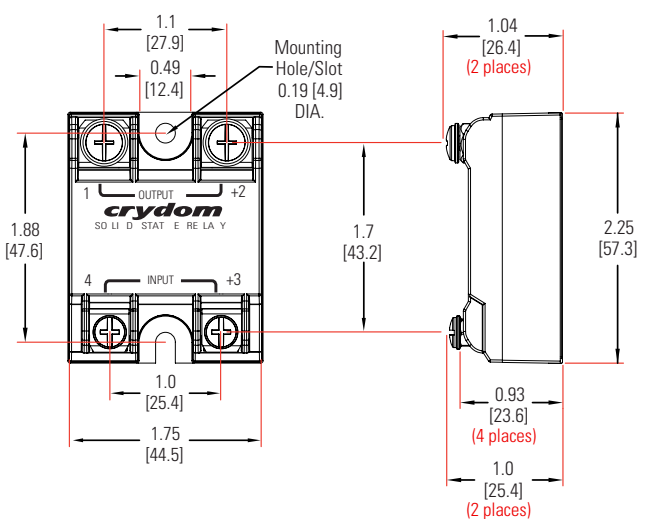
# MECHANICAL SPECIFICATIONS <sup>2</sup>

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

## Screw Termination



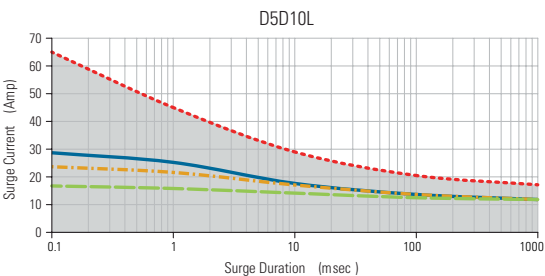
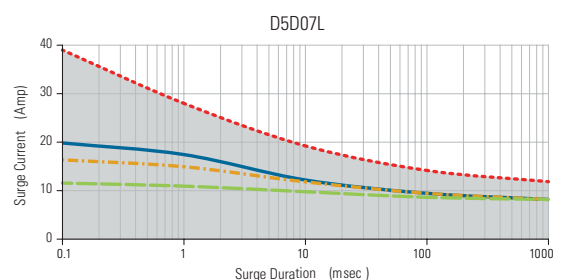
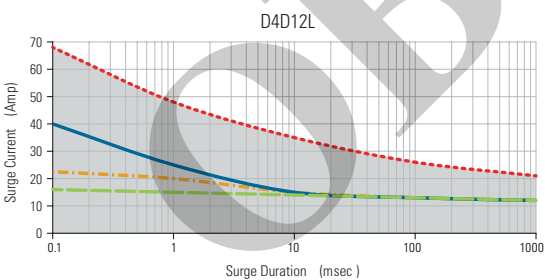
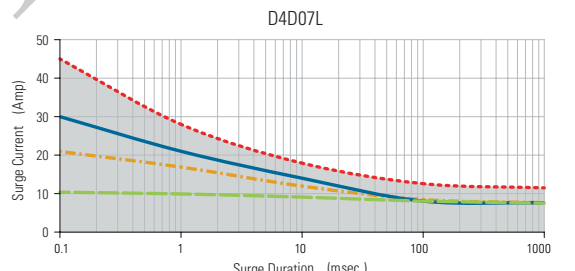
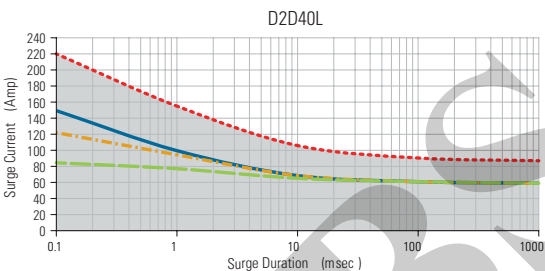
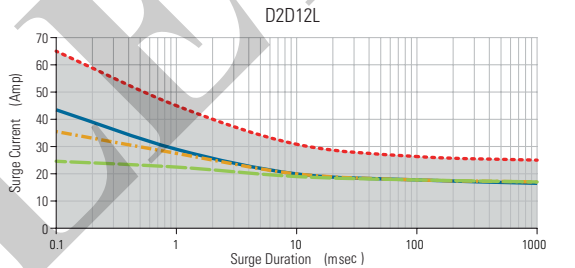
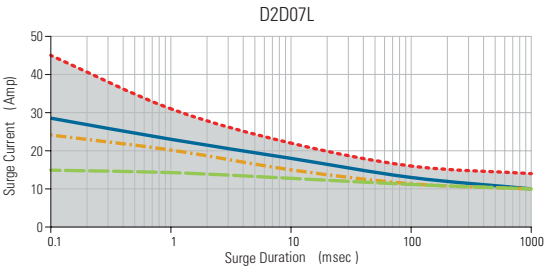
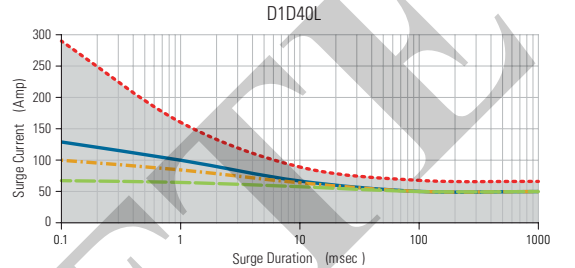
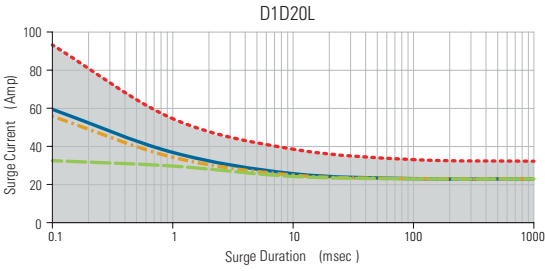
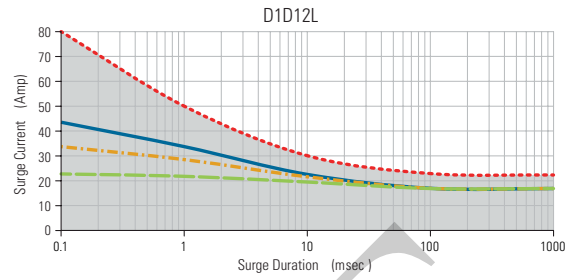
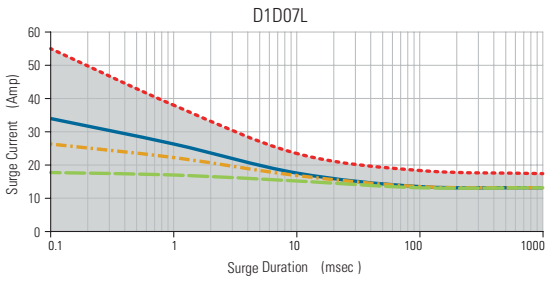
## Hex Standoff Termination ("K" Option) <sup>1</sup>





# SURGE CURRENT INFORMATION

--- Single Pulse (i) --- Duty Factor (10%) (ii) --- Duty Factor (20%) (ii) --- Duty Factor (50%) (ii)



Duty Factor 10%



Duty Factor 20%



Duty Factor 50%



For Pulse Wide Modulation applications select the curve according duty factor and pulse duration as following.

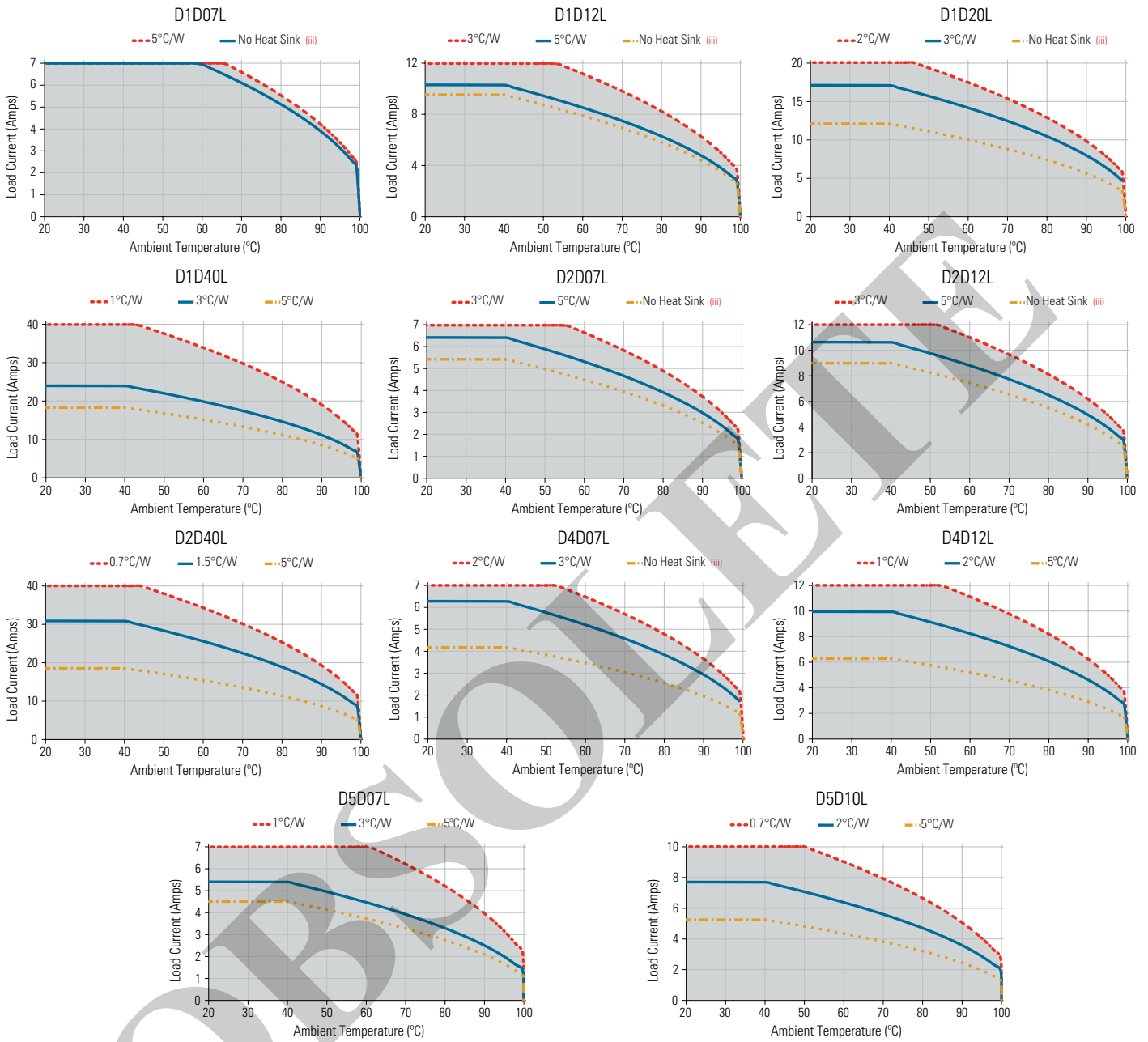
=Duty Factor  $\frac{\text{Pulse Wide}}{\text{Period}} \times 100 (\%)$

(i) for Single Surge Pulse  $T_c=40^\circ\text{C}; T_j 175^\circ\text{C}$   
(ii) for Repetitive Surge Pulse  $T_c=40^\circ\text{C}; T_j 130^\circ\text{C}$

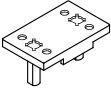

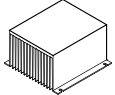




# THERMAL DERATE INFORMATION

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



New Accessories! Protective Cover & Hardware Kits			
<b>Protective Cover</b> Part number: KS101		<b>Hardware Kit</b> Part number: HK4	
	Clear plastic cover compatible with all new S1 designs. Safety covers provide added protection from electric shock when installing or checking equipment.		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 Part No.	Thermal Resistance [°C/W]	Lug Terminal	Thermal Pad	
KS101	HK1 HK4	HS501DR	5.0	TRM1	HSP-1	
		HS301 / HS301DR	3.0	TRM6	HSP-2	
		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			



## ORDERING OPTIONS

Example : D1D07-LK

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

	<b>D</b>	<b>1D</b>	<b>07</b>	-	<b>L</b>	<b>K</b>
<b>Family</b>	[Line connecting D to Family]					
<b>Operating Voltage</b>	[Line connecting 1D to Operating Voltage]					
<b>Rated Load Current</b>	[Line connecting 07 to Rated Load Current]					
<b>Termination Blank</b>	[Line connecting K to Termination Blank]					
<b>D</b>	Screws & clamps					
<b>K</b>	Installed standoffs with screws for PC Board mounting <sup>1</sup>					

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



## GENERAL NOTES

- <sup>(1)</sup> 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).
- <sup>(2)</sup> All parameters at Tc=25°C unless otherwise specified.
- <sup>(3)</sup> Heat sinking required, see derating curves.
- <sup>(4)</sup> Low current loads and high ambient temperature can affect turn-on time.
- <sup>(5)</sup> 8VDC Minimum control voltage. Resistive loads only. Consider switching losses; at maximum frequency reduce to 75% output current.
- <sup>(6)</sup> Increase minimum voltage by 1V for operations from -20 to -40°C.
- <sup>(7)</sup> Decrease maximum control voltage 1.35V/°C above 80°C ambient temperature.
- <sup>(8)</sup> All parameters at 50% power rating and 100% duty cycle (contact Crydom tech support for detailed report).

For additional information or specific questions, contact Technical Support



## 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



## 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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