



# SERIES 1 | 240 VAC PANEL MOUNT



## Features

- Ratings from 10A to 125A @ 24-280 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	50A	75A	90A	110A	125A
3-32 VDC	D2410	D2425	D2450	D2475	D2490	D24110	D24125
90-280 VAC	A2410	A2425	A2450	A2475	A2490	A24110	A24125
18-36 VAC	A2410E	A2425E	A2450E	A2475E	A2490E	A24110E	A24125E

## ORDERING OPTIONS

**A** - **24** - **10** - **E** - **K** - **P** - **G** - **S** - **H** - **-10**

**Control Voltage**

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

**Operating Voltage**

**24:** 24-280 VAC

**Rated Load Current**

**10:** 10 Amps      **75:** 75 Amps      **125:** 125 Amps  
**25:** 25 Amps      **90:** 90 Amps  
**50:** 50 Amps      **110:** 110 Amps

**Termination**

**Blank:** Screw  
**F:** Quick Connect (Up to 50 Amps only) (1)  
**K:** Hex standoffs (2)

**Overvoltage Protection**

**Blank:** Not Included  
**P:** Included (3)

**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	50A	75A	90A	110A	125A
Operating Voltage (47-440Hz) [Vrms] (6)	24-280	24-280	24-280	24-280	24-280	24-280	24-280
Transient Overvoltage [Vpk]	600	600	600	600	600	600	600
Maximum Off-State Leakage Current @ Rated Voltage [mArms] (7)	1	1	1	1	1	1	1
Minimum Off-State dv/dt @ Maximum Rated Voltage [V/μsec]	500	500	500	500	500	500	500
Maximum Load Current [Arms] (2)(8)	10	25	50	75	90	110	125
Minimum Load Current [mArms]	150	150	150	150	150	250	250
Maximum 1 Cycle Surge Current (50/60Hz) [Apk]	115/120	239/250	597/625	954/1000	1145/1200	1432/1500	1670/1750
Maximum On-State Voltage Drop @ Rated Current [Vrms]	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Thermal Resistance Junction to Case (Rjc) [°C/W]	1.03	0.8	0.45	0.3	0.27	0.25	0.22
Maximum 1/2 Cycle I <sup>2</sup> t for Fusing (50/60Hz) [A <sup>2</sup> sec]	66/60	285/259	1770/1621	4555/4150	6560/5976	10249/9338	13950/12709
Minimum Power Factor (at Maximum Load) (3)	0.5	0.5	0.5	0.5	0.5	0.5	0.5

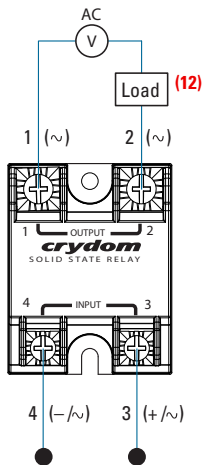
## INPUT SPECIFICATIONS (5)

Description	D24xx	A24xx	A24xxE
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

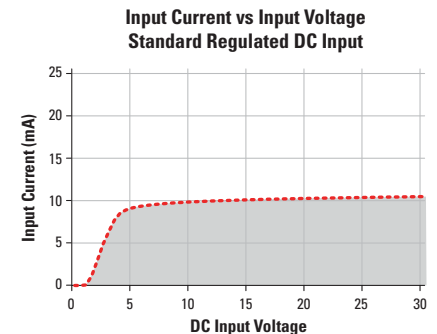
## GENERAL SPECIFICATIONS (5)

Description	Parameters
Dielectric Strength, Input/Output/Base (50/60Hz)	4000 Vrms
Minimum Insulation Resistance (@ 500 VDC)	10 <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 (74.9g)
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)

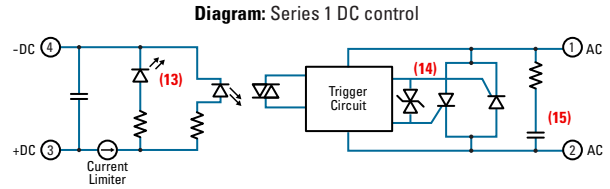
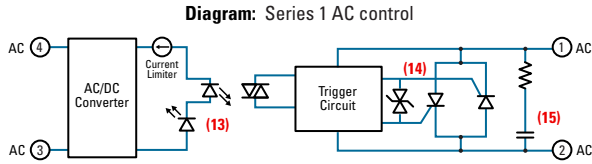
## WIRING DIAGRAM



Recommended Wire Sizes		
Terminals	Wire Size (Solid / Stranded)	Wire Pull-Out Strength (lb)[N]
Input	24 AWG (0.2 mm <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]



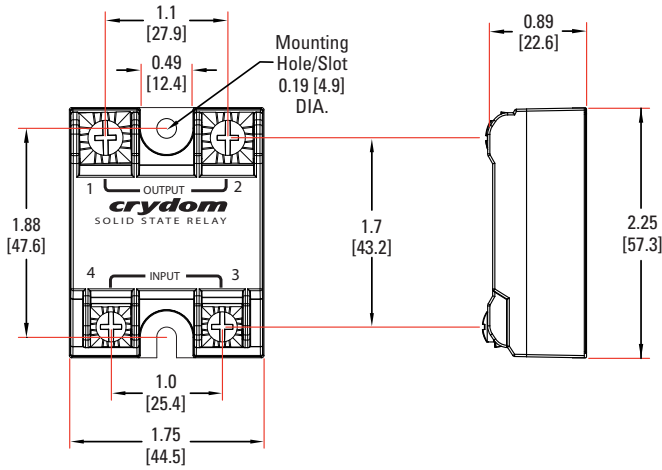
# EQUIVALENT CIRCUIT BLOCK DIAGRAMS



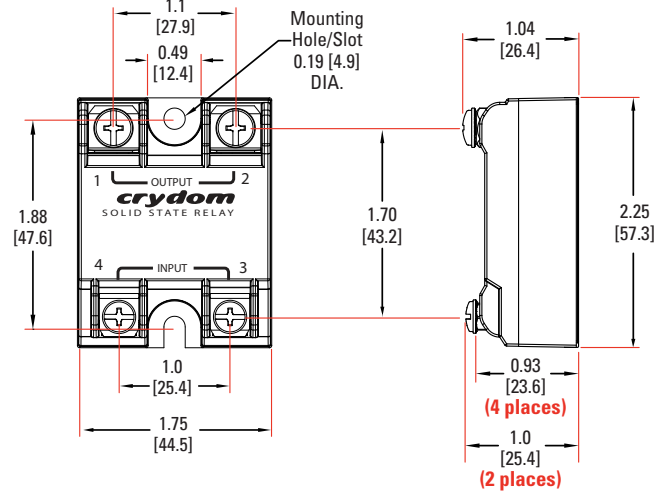
# MECHANICAL SPECIFICATIONS (5)

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

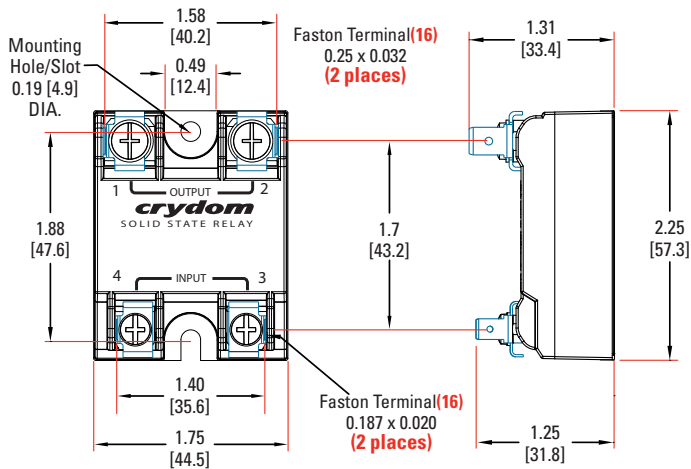
## Screw Termination



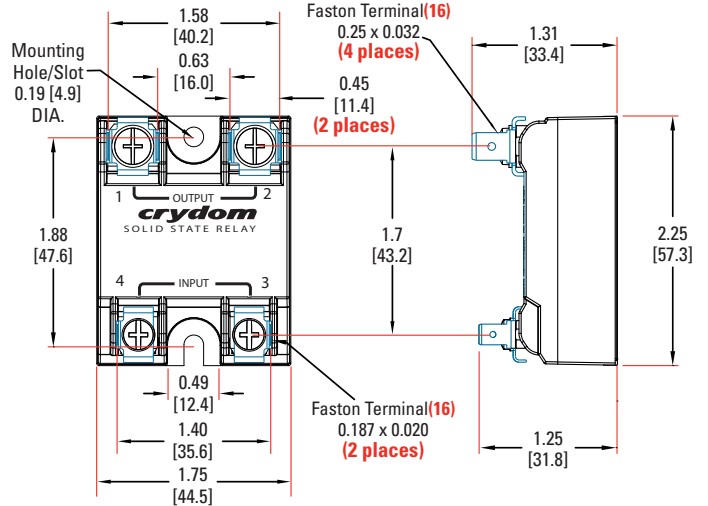
## Hex Standoff Termination ("K" Option) (2)



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



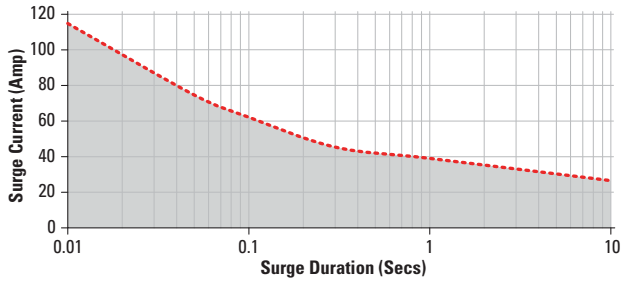
## Quick Connect Termination ("F" Option) - Up to 50 Amp (1)



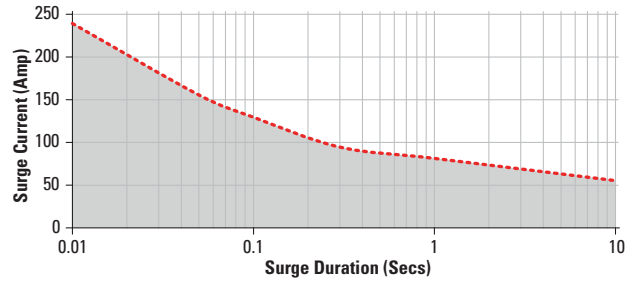


# SURGE CURRENT INFORMATION

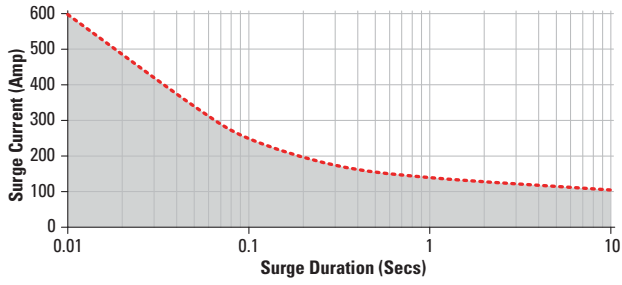
### 10 A



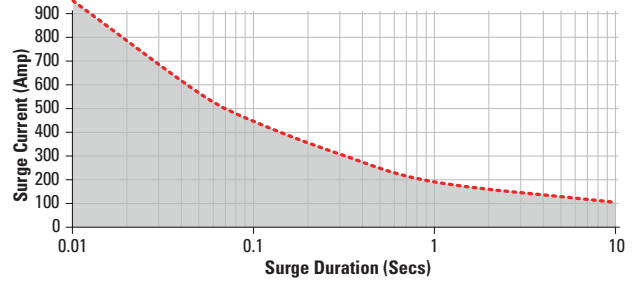
### 25 A



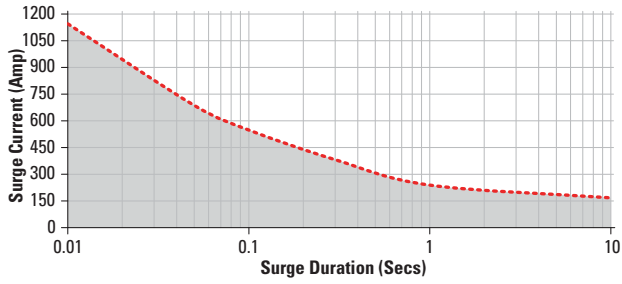
### 50 A



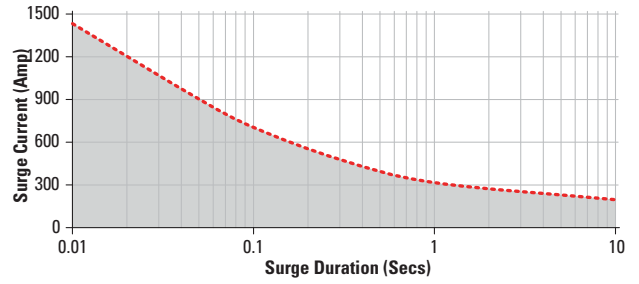
### 75 A



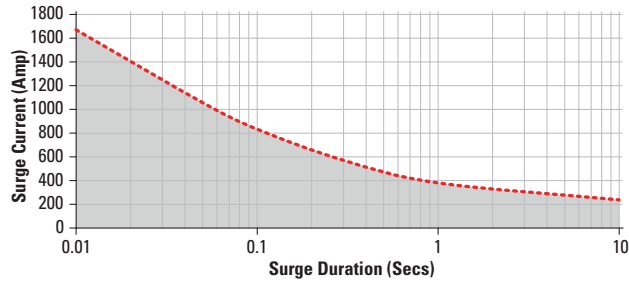
### 90 A



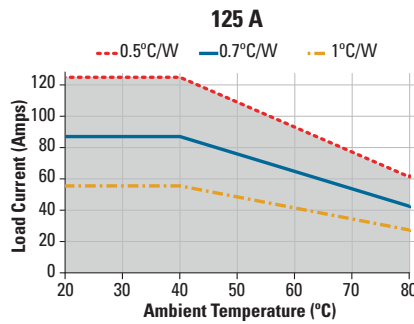
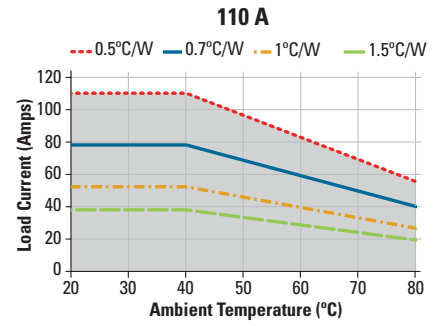
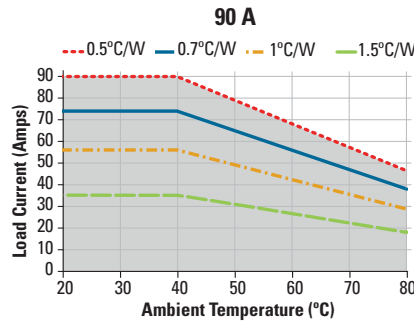
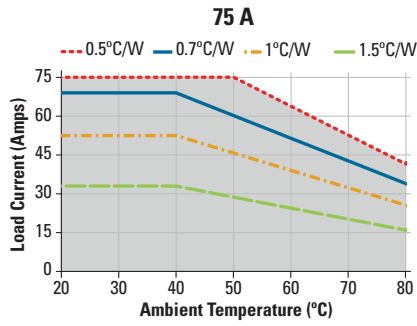
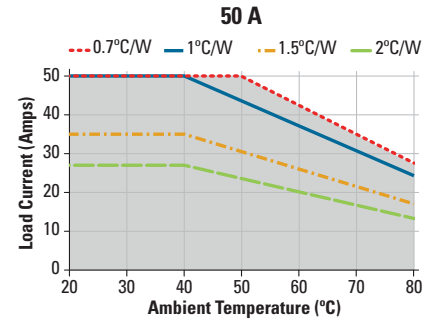
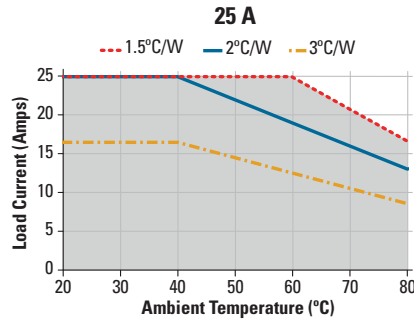
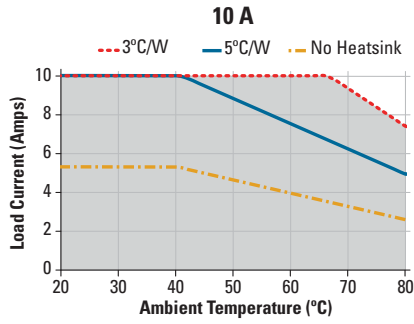
### 110 A



### 125 A



Non repetitive peak surge current at T<sub>j</sub> initial 40°C.



## 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



(except 110A & 125A models)

## 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
		Heat Sink Part No.	Thermal Resistance [°C/W]		
KS101	HK1	HS501DR	5.0	TRM1	HSP-1
		HS301 / HS301DR	3.0		
	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\* (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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