

# CSW SERIES

PANEL MOUNT



## Features

- Ratings from 10A to 90A @ 24-280 VAC
- 3-32 VDC input range
- Low off-state leakage current (snubberless)
- SCR output for heavy industrial loads
- EMC Compliant for reliable operation in harsh environments
- Replaces the CSD and CSE Series relays
- Improved SEMS screw and washer
- Redesigned housing with anti-rotation barriers
- Direct bond copper substrate
- Direct power lead frame
- Epoxy free design

## PRODUCT SELECTION

Control Voltage	10A	25A	50A	75A	90A
3-32 VDC	CSW2410	CSW2425	CSW2450	CSW2475	CSW2490

## ORDERING OPTIONS

**CSW** - **24** - **10** - **K** - **P** - **G** - **S** - **H** - **-10**

**Series**  
CSW

**Operating Voltage**  
24: 24-280 VAC

**Rated Load Current**  
10: 10 Amps    25: 25 Amps    50: 50 Amps  
75: 75 Amps    90: 90 Amps

**Termination**  
Blank: Screw  
F: Quick Connect (Up to 50 Amps. Single pair [up to 25 Amps] Double pair [up to 50 Amps]) (1)  
K: Hex standoffs for PC Board mounting (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	10 A	25 A	50 A	75 A	90 A
Operating Voltage (47-440Hz) [Vrms] (6)	24-280	24-280	24-280	24-280	24-280
Transient Overvoltage [Vpk]	600	600	600	600	600
Maximum Off-State Leakage Current @ Rated Voltage [mA] (7)	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 [A] (8)	10	25	50	75	90
Minimum Load Current [mA]	150	150	150	150	150
Maximum 1 Cycle Surge Current (50/60) [A] [pk]	115/120	239/250	597/625	954/1000	1145/1200
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]	1.03	0.8	0.45	0.3	0.27
Maximum I <sup>2</sup> t for Fusing 50/60Hz (1/2 cycle) [A <sup>2</sup> sec]	66/60	285/259	1770/1621	4555/4150	6560/5976
Minimum Power Factor (at Maximum Load)	0.5	0.5	0.5	0.5	0.5

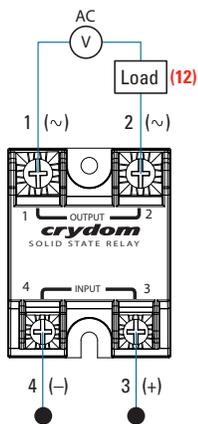
## INPUT SPECIFICATIONS (5)

Description	Parameters
Control Voltage Range (9)	3-32 VDC
Minimum Turn-On Voltage	3 VDC
Must Turn-Off Voltage	1.0 VDC
Maximum Reverse Voltage	-32 VDC
Typical Input Current	10 mA @ 12 VDC
Nominal Input Impedance	Active Current Limiter
Maximum Turn-On Time [msec] (10)	1/2 Cycle
Maximum Turn-Off Time [msec]	1/2 Cycle

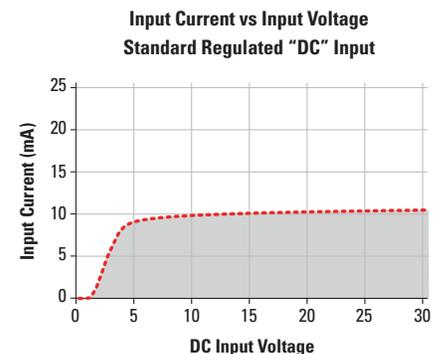
## GENERAL SPECIFICATIONS (5)

Description	Parameters
Dielectric Strength, Input/Output/Base (50/60Hz)	4000 Vrms
Minimum Insulation Resistance (@ 500 VDC)	10 <sup>9</sup> Ohm
Maximum Capacitance, Input/Output	10 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	UL94 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 Status Indicator (Color)	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)

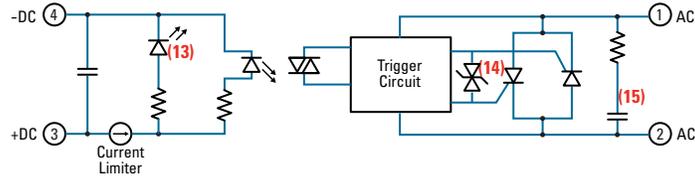
## WIRING DIAGRAM



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]



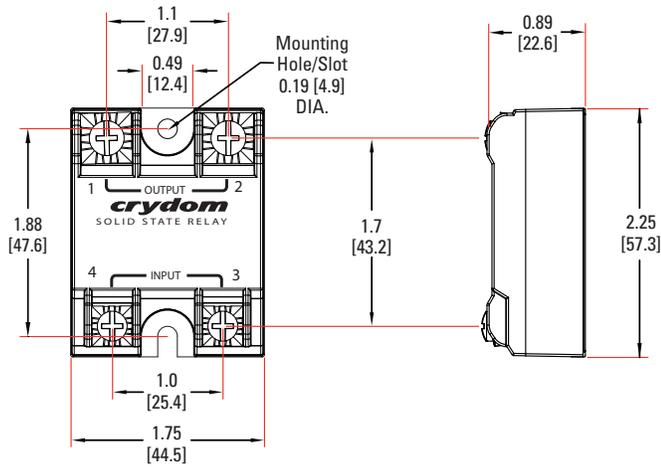
# EQUIVALENT CIRCUIT BLOCK DIAGRAM



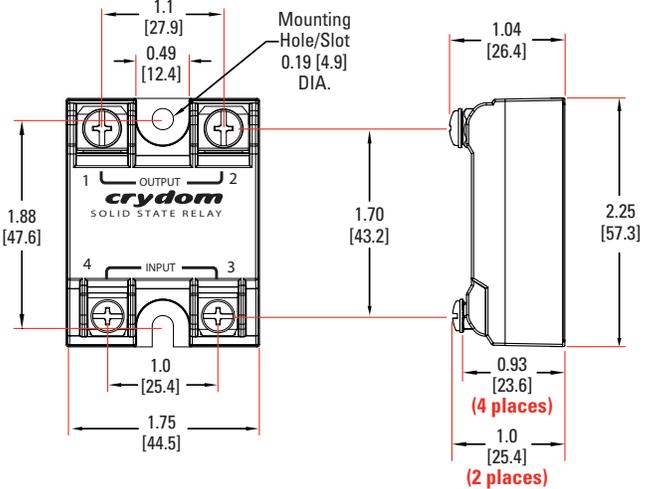
# MECHANICAL SPECIFICATIONS (5)

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

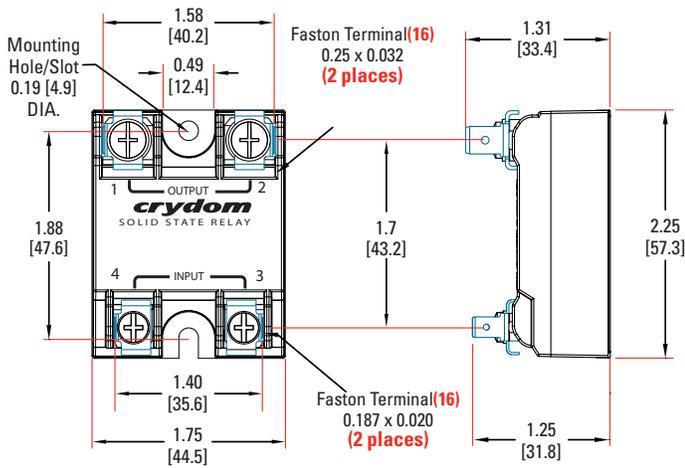
## Screw Termination



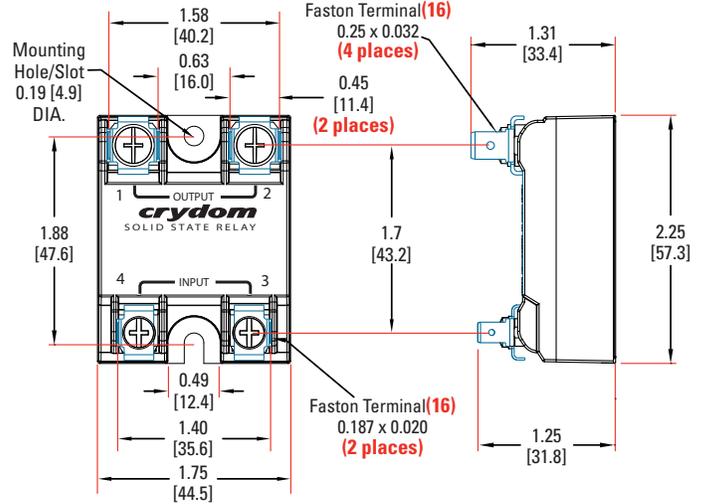
## Hex Standoff Termination ("K" Option) (2)



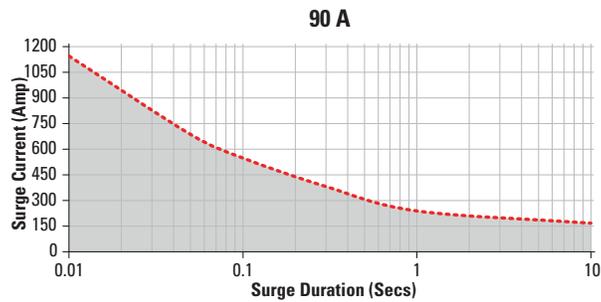
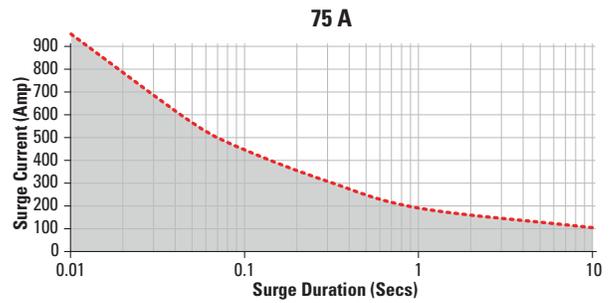
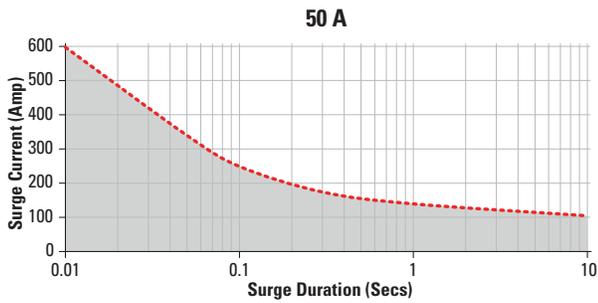
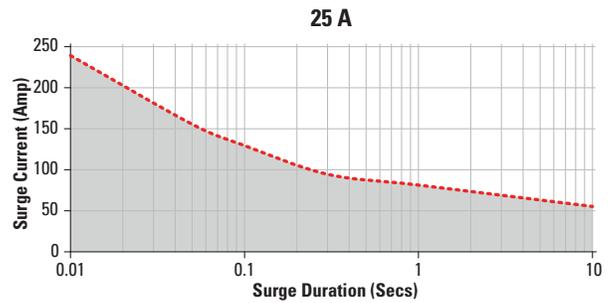
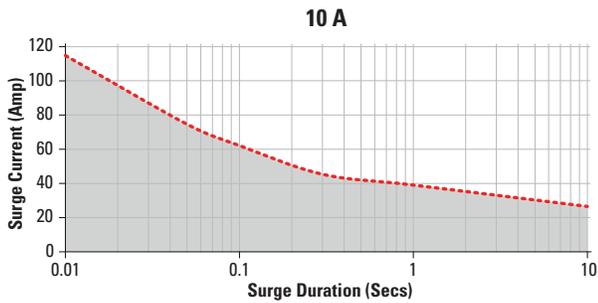
## Quick Connect Termination ("F" Option) - Up to 25 Amp (1)



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

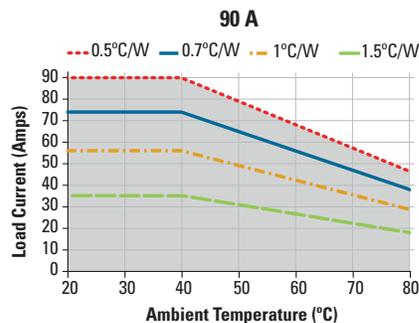
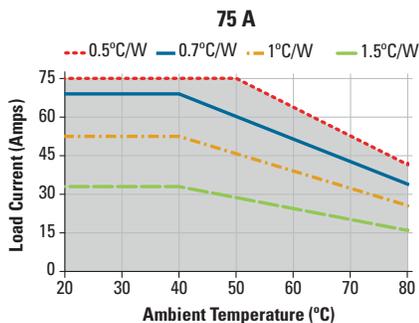
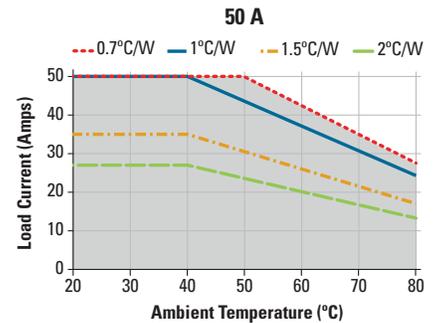
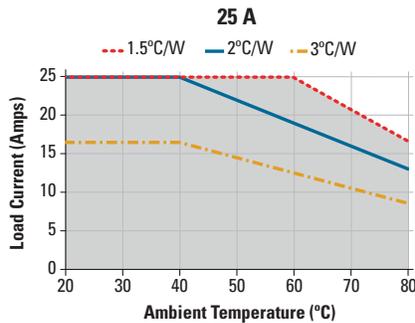
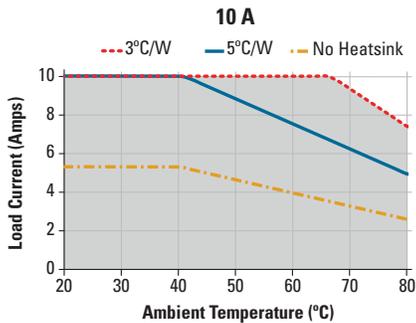


# SURGE CURRENT INFORMATION



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

# THERMAL DERATE INFORMATION



## AGENCY APPROVALS AND CERTIFICATIONS

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



## 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 TRM1 lug terminals.

### Recommended Accessories

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

## GENERAL NOTES

- (1) Single pair (up to 25 A) Double pair\* (up to 50 A). \*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, 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 version ("-10" option) is 0.1ms.
- (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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