# **Sensata** Technologies

# SERIESONE DR SERIES | AC OUTPUT

DIN RAIL MOUNT SOLID STATE RELAYS

Sensata | Crydom SeriesOne DR family of DIN Rail mount Solid State Relays incorporate proprietary thermal management technology to achieve exceptional output ratings of 3, 6 and 12 Amps at 24 to 600 VAC in compact 11mm and 18mm wide housings.

These compact SSRs are ideal for use in demanding applications where space may be limited, providing greater power density than other DIN Rail Solid State Relays.



# A

## PRODUCT SELECTION

#### 600V, 12 A **Control Voltage** 280V, 3 A 280V, 6 A 280V, 12 A 600V, 3 A 600V, 6 A 4-32 VDC DR24D03 DR24D06 DR24D12 DR48D03 DR48D06 DR48D12 90-140 VAC DR24B03 DR24B06 DR24B12 DR48B12 200-280 VAC DR24A03 DR24A06 DR24A12 DR48A12 18-36 VAC DR48E12 DR24E03 DR24E06 DR24E12

## Features

- Ratings of 3, 6 & 12 Amps
- Load voltage ratings of 24-280 VAC and 48-600 VAC
- Fits standard 35mm DIN Rail
- LED input status indicator
- AC or DC control
- Zero Voltage (resistive loads) or Instantaneous (inductive loads) turn-on output
- UL and cUL Listed, HP Rated, CE & RoHS Compliant
- UL 508 Endurance Rating for Enhanced Reliability
- UL Class I and II, Division 2, for Hazardous Locations

## Applications

- Industrial ovens
- Plastic injection molding equipment
- Packaging equipment
- Professional cooking equipment
- Lighting control
- HVAC&R

SPECIFICATIONS

## Output <sup>(1)</sup>

Description	DR24x03	DR24x06	DR24x12	DR48x03	DR48x06	DR48X12
Operating Voltage Range (47-63Hz) [Vrms]	24-280	24-280	24-280	48-600	48-600	48-600
Transient Overvoltage [Vpk]	600	600	600	1200	1200	1200
Maximum Load Current, resistive [Arms] <sup>(2)</sup>	3	6	12	3	6	12
Minimum Load Current [mArms]	150	150	150	150	150	150
Maximum Off-State Leakage Current @ Rated Voltage [mArms]	0.1	0.1	0.1	0.1	0.1	0.1
Minimum Off-State dv/dt @ Maximum Rated Voltage [V/µsec] <sup>(3)</sup>	500	500	500	500	500	500
Maximum On-State Voltage Drop @ Rated Current [Vrms]	1.3	1.3	1.3	1.3	1.3	1.3
Maximum Surge Current (50/60Hz, 1 cycle) [Apk]	285/300	285/300	715/750	285/300	285/300	715/750
Maximum I <sup>2</sup> t for Fusing (50/60 Hz, 1/2 cycle) [A <sup>2</sup> sec]	410/375	410/375	2560/2330	410/375	410/375	2560/2330
HP Rating UL 508/IEC60947 [HP (KW)] @ 240V	1/4 (.18)	1/2 (.37)	1 (.75)	1.4 (.18)	1/2 (.37)	1 (.75)
HP Rating UL 508/IEC60947 [HP (KW)] @ 380V	N/A	1 (.75)	2 (1.5)	1/3 (.25)	1 (1.5)	2 (1.5)
HP Rating UL 508/IEC60947 [HP (KW)] @ 480V	N/A	N/A	3 (2.2)	1/2 (.37)	2 (1.5)	3 (2.2)
Minimum Power Factor (at Maximum Load)	0.5	0.5	0.5	0.5	0.5	0.5
Min/Max stranded wire	22/14 AWG					
Min/Max solid wire	22/14 AWG					
Weight (Typical)	1.76 oz (50 g)	1.76 oz (50 g)	3.17 oz. (90g)	1.76 oz (50 g)	1.76 oz (50 g)	3.17 oz. (90g)

## Input <sup>(1)</sup>

Description	DRxxDxx	DRxxBxx	DRxxAxx	DRxxExx
Control Voltage Range <sup>(3)</sup>	4-32 VDC	90-140 Vrms	200-265 Vrms	18-36 Vrms <sup>(5)</sup>
Minimum Turn-On Voltage	4.0 VDC	90 Vrms	200 Vrms	18 Vrms
Must Turn-Off Voltage	1.0 VDC	10 Vrms	40 Vrms	4 Vrms
Minimum Input Current for [mA] (4)	9	3	2.5	3.5
Maximum Input Current for [mA] <sup>(4)</sup>	11	5	3.3	8
Maximum Turn-on Time [msec] <sup>(5)</sup>	1/2 Cycle	20 msec	20 msec	20 msec
Maximum Turn-off Time [msec]	1/2 Cycle	30 msec	30 msec	30 msec
Min/Max stranded/solid wire	22/16 AWG	22/16 AWG	22/16 AWG	22/16 AWG

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

Description	Parameters
Dielectric Strength, Input/Output/Base (50/60Hz)	4000 Vrms
Minimum Insulation Resistance (@ 500 V DC)	10 <sup>9</sup> Ohms
Maximum Capacitance, Input/Output	10 pF
Ambient Operating Temperature Range	-30 to 80 °C
Ambient Storage Temperature Range	-30 to 100 °C
Recommended Terminal Screw Torque Range	4.4-7.0 lb-in (0.5-0.8 Nm)



## MECHANICAL SPECIFICATIONS<sup>(1)</sup>





## **THERMAL DERATE INFORMATION**



#### 1 0 0 10 20 30 40 50 60 70 Ambient Temperature (°C)

DRxxx06

- Single and multiple units (for DRxxx03)
- Single unit, distance to adjacent components  $\geq$  11 mm for DRxxx06 and  $\geq$  18 mm for DRxxx12
- Multiple units, no minimum spacing between components

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## IEC 62314

LC A, Resistive or Slightly Inductive Load Ratings: 3A @40°C ambient for DR24x03, 3A @ 40°C ambient for DR48x03 LC A, Resistive or Slightly Inductive Load Ratings: 12 A @40°C ambient for DR24x12, 12 A @ 40°C ambient for DR48x12

- LC A, Resistive or Slightly Inductive Load Ratings: 6 A @ 40°C ambient for DR24x06, 6 A @ 40°C ambient for DR48x06
- LC B, Motor Loads Ratings: 0.18KW @ 240VAC for DR24x03 and 0.375KW @ 480VAC DR48x03
- LC B, Motor Loads Ratings: 0.75KW @ 240 VAC for DR24x06 and 2.2KW @ 480 VAC DR48x12
- LC B, Motor Loads Ratings: 0.375KW @ 240 VAC for DR24x06 and 1.5KW @ 480 VAC DR48x12

## Shock and Vibration (Applies to all part numbers)

Vibration Resistance according to IEC 60068-2-6: 0.35mm and 0.75mm Amplitude over 10-55 Hz Shock Resistance according to IEC 60068-2-27: 15g/11ms

**EMC** (Applies to all part numbers) 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

## ANSI / ISA 12.12.01-2013

Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Division 1 and 2 Hazadous (classified) locations This equipment is open-type device and is meant to be installed in an enclosure suitable for the environment such that the equipment is only accesible with the use of a tool suitable for use in Class 1, Division 2, Group A,B,C and Hazardous locations, or Nonhazardous locations only

WARNING-Explosion Hazard- Do not disconnect equipment while the circuit is live or unless the area is known to be free of ignitable concentrations WARNING-Explosion Hazard- Substitution of any component may impair suitability for Class I, Division 2



Operating Voltage       Image: Control Voltage         24: 24-280 VAC       Image: Control Voltage         Control Voltage       Image: Control Voltage         D: 4-32 VDC       Image: Control Voltage         A: 200-265 VAC       Image: Control Voltage         B: 90-140 VAC       Image: Control Voltage         E: 18-36 VAC (")       Image: Control Voltage         Rated Load Current       Image: Control Voltage         03: 3 Amps       Image: Control Voltage		DR	24	D	12	x	R	
Operating Voltage   24: 24-280 VAC   24: 24-280 VAC   48: 48-600 VAC   Control Voltage   D: 4.32 VDC   A: 200-265 VAC   B: 30-140 VAC   E: 18-36 VAC "   Rated Load Current   03: 3 Amps   05: 6 Amps   12: 12 Amps   ATEX Approvals   Blank: Not ATEX approved   X: ATEX II 3G Ex nA IIIC T4 Gc approved   Switching Type   Blank: Zero Voltage Turn-On	Series							_
24: 24-280 VAC 24: 24-280 VAC Control Voltage D: 4-32 VDC A: 200-265 VAC B: 90-140 VAC E: 18-36 VAC " Rated Load Current 03: 3 Amps 06: 6 Amps 12: 12 Amps ATEX Approvals Blank: Not ATEX approved X: ATEX II 36 Ex nA IIC 74 Gc approved X: ATEX II 36 Ex nA IIC 74 Gc approved X: ATEX II 36 Ex nA IIC 74 Gc approved X: ATEX II 36 Ex nA IIC 74 Gc approved Switching Type Blank: Zero Voltage Turn-On	DR							
48: 48-600 VAC   Control Voltage   D: 4-32 VDC   A: 200-265 VAC   B: 90-140 VAC   E: 18-36 VAC "   Rated Load Current   O3: 3 Amps   06: 6 Amps   12: 12 Amps   ATEX Approvals   Blank: Not ATEX approved   X: ATEX II 3G Ex nA IIC T4 Gc approved   X: ATEX II 3G Ex nA IIC T4 Gc approved   Switching Type   Blank: Zero Voltage Turn-On	Operatin	ıg Voltage 🗕						
D: 4-32 VDC A: 200-265 VAC B: 90-140 VAC E: 18-36 VAC (**) Rated Load Current 03: 3 Amps 06: 6 Amps 12: 12 Amps ATEX Approvals I2: 12 Amps ATEX Approvals Blank: Not ATEX approved X: ATEX II 3G Ex n A IIC T4 Gc approved X: ATEX II 3G Ex n A IIC T4 Gc approved Switching Type Blank: Zero Voltage Turn-On								
A: 200-265 VAC B: 90-140 VAC E: 18-36 VAC " Rated Load Current 03: 3 Amps 06: 6 Amps 12: 12 Amps ATEX Approvals Blank: Not ATEX approved X: ATEX II 3G Ex nA IIC T4 Gc approved Switching Type Blank: Zero Voltage Turn-On	Control V	Voltage —						
03: 3 Amps 06: 6 Amps 12: 12 Amps ATEX Approvals Blank: Not ATEX approved X: ATEX II 3G Ex nA IIC T4 Gc approved Switching Type Blank: Zero Voltage Turn-On	<b>A:</b> 200-265 V <b>B:</b> 90-140 V/	VAC AC						
06: 6 Amps 12: 12 Amps ATEX Approvals Blank: Not ATEX approved X: ATEX II 3G Ex nA IIC T4 Gc approved Switching Type Blank: Zero Voltage Turn-On	Rated Lo	ad Current						
Blank: Not ATEX approved X: ATEX II 3G Ex nA IIC 74 Gc approved Switching Type Blank: Zero Voltage Turn-On Required for valid part number	03: 3 Amps 06: 6 Amps 12: 12 Amps	1						
X: ATEX II 3G Ex nA IIC T4 Gc approved       Switching Type       Blank: Zero Voltage Turn-On	ATEX Ap	provals —						
Blank: Zero Voltage Turn-On _ Required for valid part number			approved					
	Switchin	ig Type 🛛 —						
			uffix Only)					



**GENERAL NOTES** 

- <sup>(1)</sup> All parameters at 25°C unless otherwise specified.
- <sup>(2)</sup> See Derating curves
- <sup>(3)</sup> Off-State dv/dt test method per EIA/NARM standard RS-443, paragraph 13.11.1
- <sup>(4)</sup> DC control includes reverse polarity protection.
- <sup>(5)</sup> E option is UL certified for AC control voltage, but it works also with 18-36 VDC input range.
- <sup>(6)</sup> Input circuitry incorporates active current limiter.
- <sup>(7)</sup> Turn-on time for DC control random turn-on versions is 0.1 msec.





### **ID Marker Strips**

**Black Strips** 

Part no.: CNLB

### CNLB, CNLN, CNL2





### Numbered 11 to 20 Strips Part no.: CNL2

A package of 10 plastic strips comprising 10 markers printed individually from 1 to 10 which can be placed on sockets' terminal block for easy identification during the use of multiple units. A package of 10 plastic strips comprising 10 markers printed individually from 11 to 20 which can be placed on sockets' terminal block for easy identification during the use of multiple units.



DANCER

during the use of multiple units.

A package of 10 plastic strips comprising 10

individual unprinted markers which can be placed

on sockets' terminal block for easy identification

#### 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.

Numbered 1 to 10 Strips

Part no.: CNLN



#### 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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