

# ED SERIES | AC OUTPUT

## PLUG-IN SOLID STATE RELAYS

Sensata | Crydom ED Series AC Output Plug-in Solid State Relays are designed to replace industry standard 12 x 29 mm plug-in Electromechanical Relays, offering substantial performance advantages over traditional EMR switching solutions in many applications. Available in SPST N.O. configuration, the ED Series offer output ratings of 1 to 5 Amps at 24 to 280 VAC, and they are UL 508 recognized, IEC rated and CE certified.



### Features

- AC output Solid State Relay in an Industry standard EMR plug in package
- Ratings of 1, 3 & 5 Amps
- Load voltage range of 24-280 VAC
- Fits standard DIN rail & PCB mountable sockets
- LED input status indicator
- AC or DC control
- cUL Recognized, IEC Rated, CE & RoHS Compliant
- Horsepower Rated, Pilot Duty Rated

### Applications

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



## PRODUCT SELECTION

Control Voltage	1 A	3 A	5 A
3-15 VDC Control	ED24D1	ED24D3	ED24D5
18.5-32 VDC Control	ED24C1	ED24C3	ED24C5
48-72 VDC Control		ED24F3	ED24F5
18-36 VAC Control			ED24E5
90-140 VAC Control			ED24B5



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

Description	1 A	3 A	5 A
Operating Voltage (47-63Hz) [Vrms]	24-280	24-280	24-280
Transient Overvoltage [Vpk]	600	600	600
Maximum Resistive Load Current UL 508/ IEC 62314 LC-A [Arms, FLA] <sup>(2)</sup>	1.5	3	5
Minimum Load Current [Arms]	0.025	0.15	0.15
Maximum Off-State Leakage Current @ Rated Voltage [mArms]	0.1	0.1	0.1
Minimum Off-State dv/dt @ Maximum Rated Voltage [V/μsec] <sup>(3)</sup>	500	500	500
Maximum On-State Voltage Drop @ Rated Current [Vpk]	1.1	1.1	1.1
Maximum Surge Current (50/60 Hz, 1 cycle) [Apk]	38/40	240/250	600/625
Maximum I <sup>2</sup> t for Fusing (50/ 60 HZ, 1/2 cycle) [A <sup>2</sup> sec]	7/6	285/260	1780/1620
UL 508 HP/IEC 62314 LC-B Rating @ 240V, 40°C [HP/KW]	NA	0.25 / 0.37	0.5 / 0.55
Minimum Power Factor (with Maximum Load)	0.5	0.5	0.5

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

Description	ED24Dx	ED24Cx	ED24Fx	ED24Ex	ED24Bx
Control Voltage Range	3-15 VDC	18.5-32 VDC	48-72 VDC	18-36 VAC	90-140 VAC
Minimum Turn-On Voltage	3 VDC	18.5 VDC	48 VDC	18 VAC	90 VAC
Minimum Turn-Off Voltage	1.9 VDC	10.0 VDC	24 VDC	8 VAC	20 VAC
Maximum Reverse Voltage	6 VDC	6 VDC	6 VDC	N/A	N/A
Minimum Input Current [mA]	3.8	3.8	3.8	3.8	3.2
Maximum Input Current [mA]	33.8	6.9	5.8	8.5	4.9
Nominal Input Impedance [ohms]	500	4.8K	12.5K	4.5K	28K
Maximum Turn-On Time [msec] <sup>(4)</sup>	8.33	8.33	8.33	20	20
Maximum Turn-Off Time [msec]	8.33	8.33	8.33	30	30

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

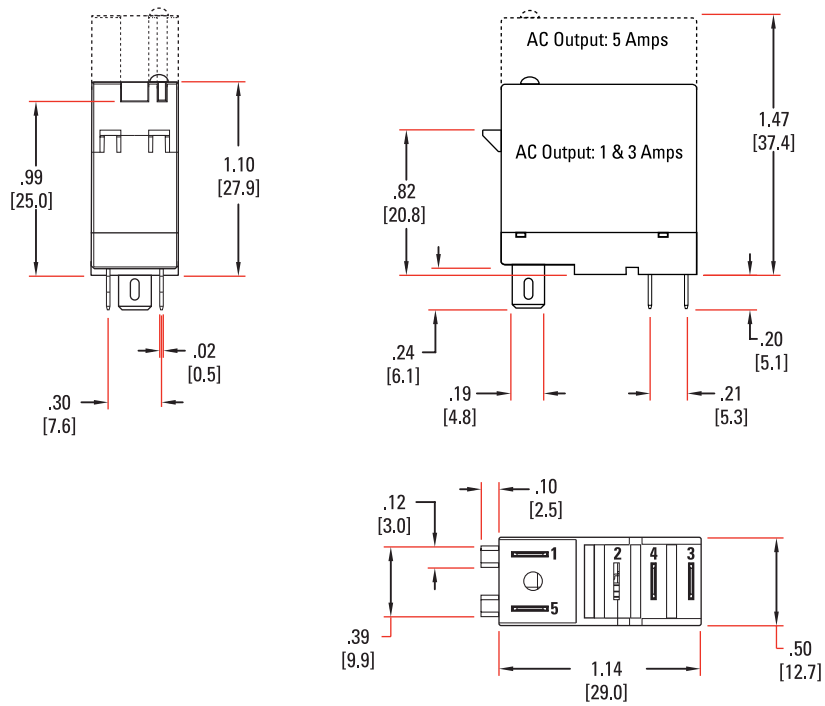
Description	Parameters
Dielectric Strength, Input to Output (50/60Hz)	3750 Vrms
Minimum Insulation Resistance (@ 500 VDC)	10 <sup>9</sup> Ohms
Maximum Capacitance, Input/Output	10 pF
Ambient Operating Temperature Range	-30°C to 80°C
Ambient Storage Temperature Range	-40°C to 125°C
Weight (typical)	1.06 oz. (30 g)
Maximum Humidity	95% non-condensing
Housing Material	Polyamide Class V0 (UL94)
Terminals Material	Copper w/ Sulfamate Nickel finish



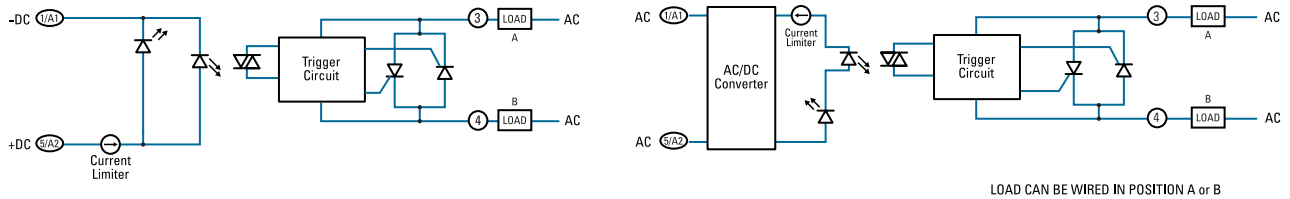
## MECHANICAL SPECIFICATIONS

Tolerance:  $\pm 0.02$  in / 0.5 mm

All dimensions are in millimeters [inches]

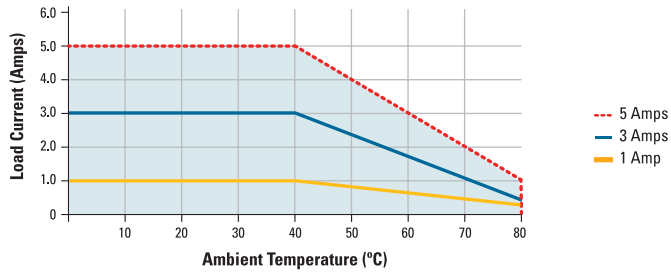


## WIRING DIAGRAM





## THERMAL DERATE INFORMATION



Above curve is based on a minimum spacing between parts of 17mm for ED24x5 and 13mm for ED24x3.

Maximum current @ 0mm spacing is 2.7A for ED24x5 and 2.3A for ED24x3 @ 40°C.

Derating Value: ED24x5 = 0.135A per mm

ED24x3 = 0.054A per mm

Derating based on Relay air gap:

Example: 10mm spacing with a ED24D5 SSR

1.- Subtract spacing from the minimum required spacing of the part (17mm) to get the correction value.

17-10=7

2.- Multiply air gap derating value found above with correction value

0.135 x 7 = 0.945A

Now using this final number we can figure out what the maximum current the relay can carry with 10mm spacing @ 60°C Ambient.

3.- using the Ambient Derating Curve above find the current for the 5A model @ 60°C. In this case that value is 3A.

4.- Subtract the value above (0.945A) from 3A. 3-0.945 = 2.055A

The maximum current you can switch with the ED24D5 with a 10mm air gap between relays @ 60°C ambient is 2.055A



## ACCESSORIES

### ED Series Accessories

#### DRSED



#### **DIN Rail Mountable Socket**

Part no.: DRSED  
Fingersafe IP10 DIN rail mountable socket to mount ED series relays onto standard 35 mm DIN rail. Rated at 250 V AC/DC, 12 Amps. The DRSED includes M3 Combo screws.

#### PCBSED



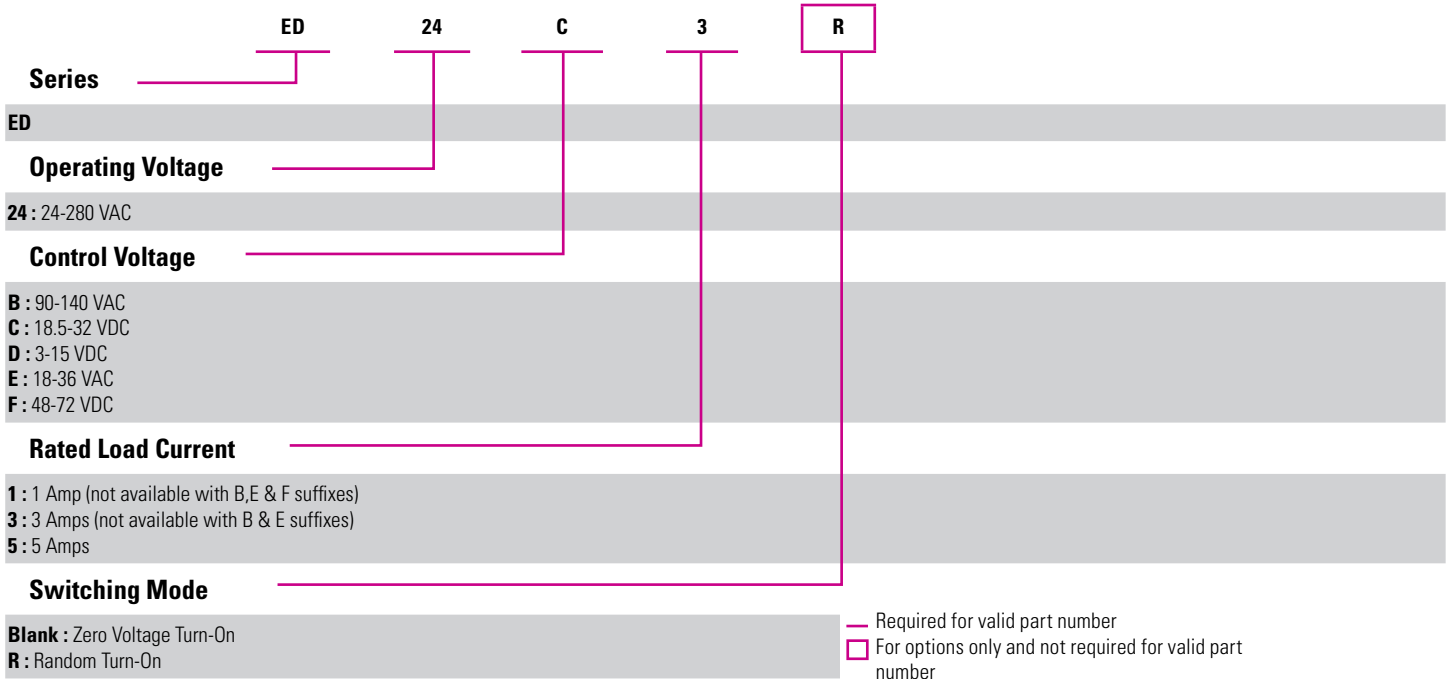
#### **PC Board Mountable Socket**

Part no.: PCBSED  
PC Board mountable socket for ED series relays. Rated at 250 V AC/DC, 12 Amps. Suggested Pin-out hole diameter: 1.0 mm



## ORDERING OPTIONS

Example : ED24C3R



## GENERAL NOTES

- (1) All parameters at 25°C unless otherwise specified.
- (2) Based on 17mm (5A model) and 13mm (3A model) spacing minimum between parts.
- (3) Off-State dv/dt test method per EIA/NARM standard RS-443, paragraph 13.11.1
- (4) Turn-On time for Random turn-on versions is 0.1ms for DC control and 5ms for AC control.



## AGENCY APPROVALS & CERTIFICATIONS



Designed in accordance with the requirements of IEC 62314  
 Pilot Duty Rated C300  
 IEC 61000-4-2 : Electrostatic Discharge Level 3 – Criteria A  
 IEC 61000-4-4 : Electrically Fast Transients Level 3 – Criteria B  
 IEC 61000-4-5 : Electrical Surges Level 3 – Criteria A



## 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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