

# Over/Under Current Sensing

## ECS Series

### Current Sensor



- Toroidal Through Hole Wiring
- 0.5...50 A Trip Point
- Adjustable or Factory Fixed Trip Delays
- 10 A SPDT Isolated Output Contacts
- 5% Trip Point Hysteresis (Dead Band)

Approvals:  

#### Description

The ECS Series of Single Phase AC Current Sensors is a universal, overcurrent or undercurrent sensing control. Its built-in toroidal sensor eliminates the inconvenience of installing a stand-alone current transformer. Includes onboard adjustments for current sensing mode, trip point, and trip delay. Detects over or under current events like locked rotor, loss of load, an open heater or lamp load, or proves an operation is taking place or has ended.

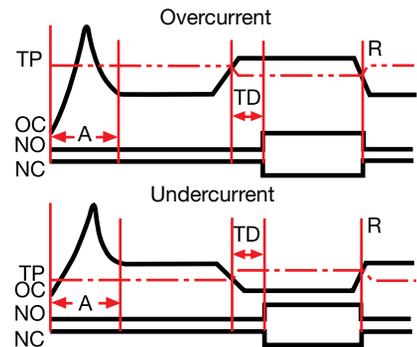
#### Operation

Input voltage must be supplied at all times for proper operation. When a fault is sensed throughout the trip delay, the output relay is energized. When the current returns to the normal run condition, the output and the delay are reset. If a fault is sensed and then corrected before the trip delay is completed, the relay will not energize and the trip delay is reset to zero.

#### Adjustment

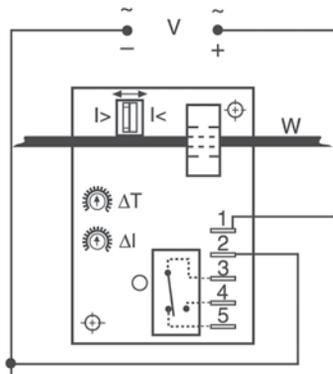
Select the desired function, over or under current sensing. Set the trip point and trip delay to approximate settings. Apply power to the ECS and the monitored load. Turn adjustment and watch the LED. LED will light; turn slightly in opposite direction until LED is off. Adjustment can be done while connected to the control circuitry if the trip delay is set at maximum.

#### Function



TP = Trip Point R = Reset OC = Monitored Current  
NO = Normally Open Contact NC = Normally Closed Contact  
A = Sensing Delay On Start Up TD = Trip Delay

#### Connection



Relay contacts are isolated.  
Dashed lines are internal connections.

V = Voltage I> = Overcurrent I< = Undercurrent  
W = Insulated Wire Carrying Monitored Current

#### Ordering Table

X Series	X Input	X Trip Point	X Trip Delay	X Sensing Delay on Start up
<b>ECS</b> - (selectable over or under current sensing)	<b>-1</b> - 12 V DC	Fixed - Specify <b>2 ... 50</b> A in 1 A increments	<b>-F</b> - Factory Fixed: Specify <b>.08 ... 50</b> s	<b>Blank</b> - 0 s
<b>ECSH</b> - (overcurrent sensing)	<b>-2</b> - 24 V AC	<b>Adjustable Ranges</b> <b>-0</b> - 0.5 ... 5 A <b>-1</b> - 2 ... 20 A <b>-H</b> - 5 ... 50 A	<b>Adjustable Ranges</b> <b>-A</b> - 0.150 ... 7 s <b>-B</b> - 0.5 ... 50 s	<b>C</b> - 1 s
<b>ECSL</b> - (undercurrent sensing)	<b>-3</b> - 24 V DC			<b>D</b> - 2 s
	<b>-4</b> - 120 V AC			<b>E</b> - 3 s
	<b>-6</b> - 230 V AC			<b>F</b> - 4 s
				<b>G</b> - 5 s
				<b>H</b> - 6 s

Example P/N: **ECS41AC** Fixed - **ECSH610AD**

#### Accessories



Female quick connect P/Ns:

- P1015-13** (AWG 10/12)
- P1015-64** (AWG 14/16)
- P1015-14** (AWG 18/22)

See accessory pages for specifications.

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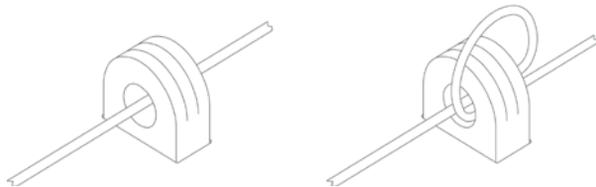
### Current Sensor

Current  
Sensors &  
Monitors

#### Technical Data

<b>Sensor</b>		
Type		Toroidal, through hole wiring
Mode		Over or under current, switch selectable on the unit or factory fixed
Trip Point Range		0.5 ... 50 A in 3 adjustable ranges or fixed
Tolerance:	Adjustable	Guaranteed range
	Fixed	0.5 ... 25 A: 0.5 A or +/-5% whichever is less; 26 ... 50 A: +/-2.5%
Maximum Allowable Current		Steady – 50 A turns; Inrush – 300 A turns for 10 s
Trip Point Hysteresis		≅ +/-5%
Trip Point vs. Temperature		+/-5%
Response Time		≤ 75 ms
Frequency		45 ... 500 Hz
Type of Detection		Peak detection
<b>Trip Delay</b>		
Type		Analog
Range:	Adjustable	0.150 ... 7 s; 0.5 ... 50 s (Guaranteed ranges)
	Factory Fixed	0.08 ... 50 s (+/-10%)
Delay vs. Temperature		+/-15%
Sensing Delay on Startup		Factory fixed 0 ... 6 s: +40% ... 0%
<b>Input</b>		
Voltage		24 , 120, or 230 V AC; 12 or 24 V DC
Tolerance	12 V DC & 24 V DC/AC	-15% ... +20%
	120 & 230 V AC	-20% ... +10%
Line Frequency		50 ... 60 Hz
<b>Output</b>		
Type		Electromechanical relay
Form		Isolated single pole double throw (SPDT)
Rating		10 A resistive at 240 V AC; 1/4 hp at 125 V AC; 1/2 hp at 250 V AC
Life		Mechanical – 1 x 10 <sup>6</sup> ; Electrical – 1 x 10 <sup>5</sup>
<b>Protection</b>		
Circuitry		Encapsulated
Isolation Voltage		≥ 2500 V RMS input to output
Insulation Resistance		≥ 100 MΩ
<b>Mechanical</b>		
Mounting		Surface mount with two #6 (M3.5 x 0.6) screws
Termination		0.25 in. (6.35 mm) male quick connect terminals (5)
Humidity		95% relative, non-condensing
Operating/Storage Temperature		-40°C ... +60°C / -40°C ... +85°C
Weight		≅ 6.4 oz (181 g)

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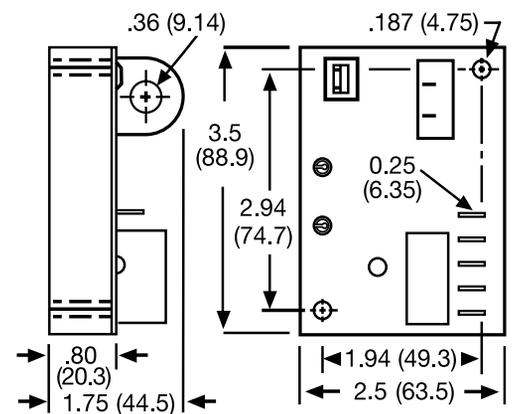
#### Multiple Turns To Increase Sensitivity

To increase sensitivity, multiple turns may be made through the ECS's toroidal sensor. The trip point range is divided by the number of turns through the toroidal sensor to create a new range.

#### Using an External Current Transformer (CT)

Select a 2 VA, 0 to 5 A output CT, rated for the current to be monitored. Select ECS adjustment range 0. Pass the CT's secondary wire lead through the ECS's toroid and connect both ends together.

#### Mechanical View



Inches (Millimeters)