# **Protection Relays** Current Monitoring Relays and Transducers



# **Current Sensors**



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V = Voltage

I> = Overcurrent

toward the load.

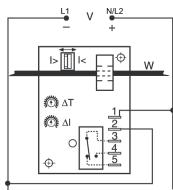
I< = Undercurrent

W = Insulated Wire Carrying

Monitored Current

Relay contacts are isolated. Arrow on the toroid points

## **Wiring Diagram**



# **Ordering Information**

See next page.

# 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 undercurrent 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 or zero, 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. To increase sensitivity, multiple turns may be made through the ECS's toroidal sensor. The appropriate trip point range is determined by multiplying the amperage load by the number of turns/passes through the toroidal sensor. When using an external CT, select a 2VA, 0-5A output CT rated for the current to be monitored. Select ECS adjustment range 0. Pass one secondary wire lead through the ECS toroid and connect the secondary leads together.

# Features & Benefits

FEATURES	BENEFITS		
Built-in toroidal current sensing	Eliminates need to install stand-alone current transformer and provides isolation from monitored circuit		
Encapsulated	Protects against shock, vibration, and humidity		
Adjustable mode, trip point and trip delay	Provides flexibility for use in many applications		
10A, SPDT isolated relay output	Allows control of AC voltage loads		

#### Accessories



P1015-13 (AWG 10/12), P1015-64 (AWG 14/16), P1015-14 (AWG 18/22) Female Quick Connect These 0.25 in. (6.35 mm) female terminals are constructed with an insulator barrel to provide strain relief.

# ECS SERIES

MODEL

**Ordering Information** 

SENSING

SENSING DELAY ON STARTUP

#### ECS20BC Selectable, over or undercurrent 24VAC 0.5 - 5A 0.5 - 50s 1s 24VAC 2 - 20A ECS21BC Selectable, over or undercurrent 0.5 - 50s 1s 24VAC 5 - 50A ECS2HBC Selectable, over or undercurrent 0.5 - 50s 1s ECS30AC Selectable, over or undercurrent 24VDC 0.5 - 5A 0.150 - 7s 1s ECS40A Selectable, over or undercurrent 120VAC 0.5 - 5A 0.150 - 7s 0s ECS40AC Selectable, over or undercurrent 120VAC 0.5 - 5A 0.150 - 7s 1s ECS40BC 120VAC 0.5 - 5A Selectable, over or undercurrent 0.5 - 50s 1s ECS41A Selectable, over or undercurrent 120VAC 2 - 20A 0.150 - 7s Os 120VAC ECS41AC Selectable, over or undercurrent 2 - 20A 0.150 - 7s 1s ECS41BC 120VAC 2 - 20A 0.5 - 50s Selectable, over or undercurrent 1s ECS41BD 120VAC 2 - 20A Selectable, over or undercurrent 0.5 - 50s 2s ECS41BH Selectable, over or undercurrent 120VAC 2 - 20A 0.5 - 50s 6s ECS4HBC Selectable, over or undercurrent 120VAC 5 - 50A 0.5 - 50s 1s ECS4HBH Selectable, over or undercurrent 120VAC 5 - 50A 0.5 - 50s 6s ECS60AH 230VAC 0.5 - 5A 0.150 - 7s 6s Selectable, over or undercurrent ECS60BC Selectable, over or undercurrent 230VAC 0.5 - 5A 0.5 - 50s 1s ECS61BC Selectable, over or undercurrent 230VAC 2 - 20A 0.5 - 50s 1s ECS6HAH Selectable, over or undercurrent 230VAC 5 - 50A 0.150 - 7s 6s ECSH21F2.5C Overcurrent 24VAC 2 - 20A 2.5s 1s ECSH30AC 0.5 - 5A 0.150 - 7s Overcurrent 24VDC 1s 24VDC 2 - 20A 2s ECSH31AD Overcurrent 0.150 - 7s

INPUT VOLTAGE

TRIP POINT ADJUSTABLE

TRIP DELAY

ECSH31F.08D	Overcurrent	24VDC	2 - 20A	0.08s	2s
ECSH3HF0.08D	Overcurrent	24VDC	5 - 50A	0.08s	2s
ECSH34F.08C	Overcurrent	24VDC	4A non-adjustable	0.08s	1s
ECSH40A	Overcurrent	120VAC	0.5 - 5A	0.150 - 7s	Os
ECSH40AC	Overcurrent	120VAC	0.5 - 5A	0.150 - 7s	1s
ECSH40AD	Overcurrent	120VAC	0.5 - 5A	0.150 - 7s	2s
ECSH41AC	Overcurrent	120VAC	2 - 20A	0.150 - 7s	1s
ECSH41AD	Overcurrent	120VAC	2 - 20A	0.150 - 7s	2s
ECSH41BC	Overcurrent	120VAC	2 - 20A	0.5 - 50s	1s
ECSH41F.08D	Overcurrent	120VAC	2 - 20A	0.08s	2s
ECSH4HAD	Overcurrent	120VAC	5 - 50A	0.150 - 7s	2s
ECSH4HF.08D	Overcurrent	120VAC	5 - 50A	0.08s	2s
ECSH61AD	Overcurrent	230VAC	2 - 20A	0.150 - 7s	2s
ECSL31A	Undercurrent	24VDC	2 - 20A	0.150 - 7s	Os
ECSL40AC	Undercurrent	120VAC	0.5 - 5A	0.150 - 7s	1s
ECSL40B	Undercurrent	120VAC	0.5 - 5A	0.5 - 50s	Os
ECSL40BH	Undercurrent	120VAC	0.5 - 5A	0.5 - 50s	6s
ECSL41A	Undercurrent	120VAC	2 - 20A	0.150 - 7s	Os
ECSL41AD	Undercurrent	120VAC	2 - 20A	0.150 - 7s	2s
ECSH4HAD	Overcurrent	120VAC	5 - 50A	0.150 - 7s	2s
ECSL41AH	Undercurrent	120VAC	2 - 20A	0.150 - 7s	6s
ECSL4HAC	Undercurrent	120VAC	5 - 50A	0.150 - 7s	1s
ECSL4HBH	Undercurrent	120VAC	5 - 50A	0.5 - 50s	6s
ECSL61AH	Undercurrent	230VAC	2 - 20A	0.150 - 7s	6s
ECSL6HAC	Undercurrent	230VAC	5 - 50A	0.150 - 7s	1s

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### Specifications

ECS SERIES

<mark>Sensor</mark> Type Mode

Trip Point Range Tolerance Adjustable Fixed

Maximum Allowable Current

Trip Point Hysteresis Trip Point vs. Temperature Response Time Frequency Type of Detection Trip Delay Type Range Adjustable Factory Fixed Delay vs. Temperature Sensing Delay on Startup Input Voltage

Tolerance 12VDC & 24VDC/AC 120 & 230VAC AC Line Frequency Output

Type Form Rating

Life

#### Protection Circuitry Isolation Voltage Insulation Resistance Mechanical

Mounting Dimensions

Termination

#### Environmental

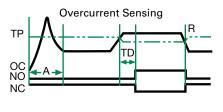
Operating/Storage Temperature Humidity Weight

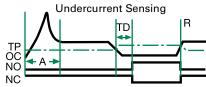
Over or undercurrent, switch selectable on the unit or factory fixed 0.5 - 50A in 3 adjustable ranges or fixed Guaranteed range 0.5 - 25A: 0.5A or ±5% whichever is less; 26 - 50A: ±2.5% Steady - 50A turns; Inrush - 300A turns for 10s ≅ ±5% ±5% ≤ 75ms 45/500 Hz Peak detection Analog 0.150 - 7s; 0.5 - 50s (guaranteed ranges) +/- 10% ±15% Factory fixed 0 - 6s: +40%, -0% 24, 120, or 230VAC; 12 or 24VDC -15 - 20% -20 - 10% 50/60 Hz Electromechanical relay Isolated, SPDT 10A resistive @ 240VAC; 1/4 hp @ 125VAC; 1/2 hp @ 250VAC Mechanical - 1 x 106; Electrical - 1 x 105 Encapsulated ≥ 2500V RMS input to output ≥ 100 MΩ Surface mount with two #6 (M3.5 x 0.6) screws H 88.9 mm (3.5"); W 63.5 mm (2.5"); **D** 44.5 mm (1.75") 0.25 in. (6.35 mm) male guick connect terminals (5)

Toroidal through hole wiring

-40° to 60°C / -40° to 85°C 95% relative, non-condensing ≅ 6.4 oz (181 g)

# **Function Diagrams**





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

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