

Installation Instructions

CurrentWatch™ ECS Series Current Switch

AC Current Switch, Fixed or Adjustable Setpoint



WARNING

IN ORDER TO AVOID ELECTRIC SHOCK OR OTHER POSSIBLE INJURY:

- **DO NOT USE THIS PRODUCT FOR HUMAN SAFETY APPLICATIONS. IT WAS NOT DESIGNED, TESTED OR RECOMMENDED FOR THIS USE.**
- **DO NOT USE THIS PRODUCT IN HAZARDOUS LOCATIONS (E.G. EXPLOSIVE ATMOSPHERES). IT WAS NOT DESIGNED, TESTED OR RECOMMENDED FOR THIS USE.**
- **ENSURE THE PRODUCT IS PROPERLY WIRED FOR THE APPLICATION. REFER TO THE SPECIFICATIONS AND WIRING DIAGRAMS IN THIS MANUAL.**

MODELS COVERED IN THIS MANUAL

Catalog Number	Description
ECSNOASC	Self-Powered, Solid Core, N.O., Adjustable Setpoint (1-150A), LED
ECSNOFSC	Self-Powered, Solid Core, N.O., Fixed Setpoint (1.0A), No LED
ECSNCASC	Self-Powered, Solid Core, N.C., Adjustable Setpoint (1-150A), LED
ECSNCFSC	Self-Powered, Solid Core, N.C., Fixed Setpoint (1.0A), No LED
ECSNOASP	Self-Powered, Split Core, N.O., Adjustable Setpoint (1.75-150A), LED
ECSNOFSP	Self-Powered, Split Core, N.O., Fixed Setpoint (1.5A), No LED
ECSNCASP	Self-Powered, Split Core, N.C., Adjustable Setpoint (1.75-150A), LED
ECSNCFSP	Self-Powered, Split Core, N.C., Fixed Setpoint (1.5A), No LED

INTRODUCTION

The Cutler-Hammer CurrentWatch™ ECS Series are a family of self-powered, solid-state current-operated switches which trigger when the current level sensed through the aperture exceeds the adjusted setpoint. The solid-state output contacts can switch AC or DC, making the ECS Series well suited for applications in automation systems.



Eaton's current sensor family encompasses a broad range of products for cost-effective monitoring, status, and predictive maintenance. Downtime and costly repairs can be avoided by utilizing Eaton's products and technologies in your control systems.

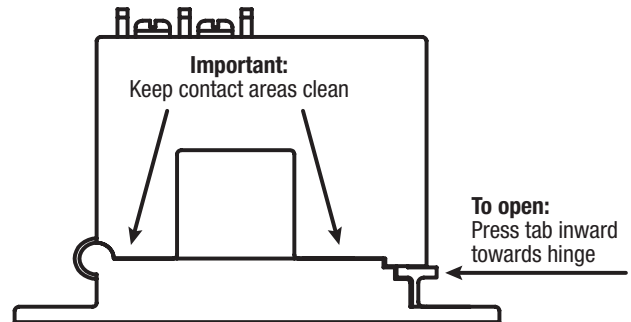
INSTALLATION

Considerations for all ECS Series models...

- Run wire to be monitored through the aperture (opening) in the switch body
- These switches can be located in the same environment as motors, contactors, heaters, pull-boxes and other electrical enclosures
- Mounting can be done in any position or hung directly on wires with a wire tie

Considerations for split core versions (-SP suffix)...

- To open the switch, press the tab inward (toward the body of the switch) as shown below
- After placing the wire in the aperture, press the hinged portion firmly downward until a click is heard and the tab pops out fully
- Keep the contact areas of split-core switches clean at all times



QUICK INSTALL GUIDE

The below steps can be followed to quickly install a CurrentWatch™ ECS Series switch.

1. Run the wire to be monitored through the aperture
2. Mount the switch
3. Connect output wiring
 - a. Use up to 14 AWG copper wires
 - b. Use caution not to exceed solid state output rating (see specification table on following page)
3. Adjust the setpoint
 - a. Use the potentiometer to adjust the setpoint

LED/OUTPUT STATUS TABLE

Monitored Amps	Output		Smart-LED (If Present)
	N.C.	N.O.	
None or Minimum	Closed	Open	Off
Below Trip Level	Closed	Open	Slow (2 sec.)
Above Trip Level	Open	Closed	Fast (0.5 sec.)

RANGES AND MAXIMUM AMPS

Housing Style	Setpoint	Outputs	Maximum Input Amps		
			Continuous	6 sec.	1 sec.
Solid Core	Fixed (1.0A)	N.O.	250A	400A	1,000A
		N.C.	150A	400A	1,000A
	Adjustable (1-150A)	N.O.	150A	400A	1,000A
		N.C.	150A	400A	1,000A
Split Core	Fixed (1.5A)	N.O.	250A	400A	1,000A
		N.C.	150A	400A	1,000A
	Adjustable (1.75-150A)	N.O.	150A	400A	1,000A
		N.C.	150A	400A	1,000A

SETPOINT ADJUSTMENT

The CurrentWatch™ ECS Series setpoint is adjusted with a four-turn potentiometer (for models ending -SP) or a fifteen-turn potentiometer (for models ending -SC). The pot is shipped factory set to the lowest setpoint, fully clockwise. Turning the pot counter-clockwise will increase the setpoint. The pot has a slip-clutch to prevent damage at either end of its rotation. To determine where the adjustment is, turn the pot all the way clockwise. This will return it to the minimum setpoint.

Important Setpoint Adjustment Notes

- Output contacts are solid-state. Check output status by applying voltage to the contacts and reading the voltage drop across the contacts. An Ohmmeter set on “continuity” will give misleading results.
- It is recommended the setpoint be adjusted to allow for voltage variations of 10 to 15 percent.
- Mounting can be done in any position or hung directly on wires with a wire tie

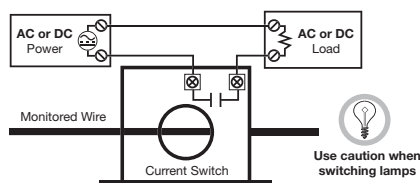
Typical Adjustment Steps

1. Turn the pot to the minimum setpoint (four or fifteen turns clockwise).
2. Have normal operating current running through the switch. The output should be tripped since the pot is at its minimum setpoint. For units with an LED, it should be flashing fast (two to three times per second).
3. Turn the pot counter-clockwise until the unit un-trips. This is indicated by the slow flashing of the LED (once every two to three seconds), or by changing of the output switch status.
4. Now turn the pot clockwise slowly until the unit trips again. It is now set at the current level being monitored.
 - a. To set underload, turn the pot about 1/8 turn further clockwise
 - b. To set overload, turn the pot about 1/8 turn further counter-clockwise

WIRING DIAGRAM

Connect control or monitoring wires to the sensor. Use up to 14 AWG copper wire and tighten terminals to 5 inch-pounds torque. Be sure the output load does not exceed the switch rating.

CAUTION! Incandescent lamps can have “cold filament inrush” current of up to ten times their rated amperage. Use caution when switching lamps.



TROUBLESHOOTING

Problem	Solution
Switch is always tripped	The setpoint may be too low. Turn the pot counter-clockwise to increase the setpoint. The switch may have been overloaded and the contacts are burned out. Check the output load, remembering to include inrush on inductive loads (coils, motors, ballasts).
Switch will not trip	The setpoint may be too high. Turn the pot clockwise to decrease the setpoint. On split core models, the core contact area may be dirty. Open the switch and clean the contact area. The monitored current may be below the minimum required. Loop the monitored wire several times through the aperture until the “sensed” current rises above the minimum. The sensed amps equals “actual amps” multiplied by the “number of loops.” Count loops on the inside of the aperture. The switch may have been overloaded and the contacts are burned out. Check the output load, remembering to include inrush on inductive loads (coils, motors, ballasts).

SPECIFICATIONS

	Solid Core	Split Core
Power Supply	Self Powered—No Power Supply Needed	
Output	Magnetically Isolated Solid-State Switch	
Output Rating	Normally Open Models: 0.15A, 240V AC/DC Normally Closed Models: 0.20A, 135V AC/DC	
Off-State Leakage	< 10 µA	
Response Time	120 ms	
Adjustable Setpoint Range	1-150A	1.75-150A
Setpoint Adjustment	15-Turn Potentiometer	4-Turn Potentiometer
Fixed Setpoints	1.0A	1.5A
Hysteresis	Approximately 5% of Setpoint	
Overload	Fixed Setpoint, N.O. Models: 6 sec. @ 500A; 1 sec. @ 1,000A All Other Models: 6 sec. @ 400A; 1 sec. @ 1,000A	
Isolation Voltage	UL Listed to 1,270V AC, Tested to 5,000V AC	
Frequency Range	6-100Hz	
Sensing Aperture	0.74 in. (19mm)	0.85 in. (21.6mm)
Housing	UL94 V0 Flammability Rated	
Environmental	Operating Temperature: -58 to +122° F (-50 to +50° C) Humidity: 0-95% RH, Non-Condensing	
Approvals	UL and ULC Listed CE Certified	