

Installation Instructions

CurrentWatch™ ECS7 Series Current Switches

Self-Calibrating AC Current Switch with Solid State Outputs



WARNING

IN ORDER TO AVOID ELECTRIC SHOCK OR OTHER POSSIBLE INJURY:

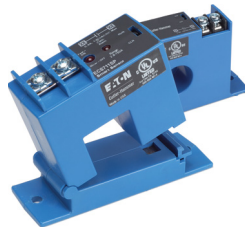
- **DO NOT USE THIS PRODUCT FOR HUMAN SAFETY APPLICATIONS. IT WAS NOT DESIGNED, TESTED OR RECOMMENDED FOR THIS USE.**
- **DO NOT USE THIS PRODUCT IN HAZARDOUS LOCATIONS (E.G. EXPLOSIVE ATMOSPHERES). IT WAS NOT DESIGNED, TESTED OR RECOMMENDED FOR THIS USE.**
- **ENSURE THE PRODUCT IS PROPERLY WIRED FOR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

MODELS COVERED IN THIS MANUAL

Catalog Number	Description
ECS701SC	Solid Core, N.O., Over/Under Load
ECS700SC	Solid Core, N.O., Overload Only
ECS702SC	Solid Core, N.O., Underload Only
ECS711SP	Split Core, N.O., Over/Under Load
ECS710SP	Split Core, N.O., Overload Only
ECS712SP	Split Core, N.O., Underload Only

INTRODUCTION

The CurrentWatch™ ECS7 Series current switches are designed for overload, underload or operating window applications. Upon sensing an average operating current, the ECS7 Series self-learns and establishes a limit-alarm trip point based on plus or minus 15 percent of the average expected current being monitored. The ECS7 Series is available in solid or split core housing styles.



The ECS7 Series magnetically isolated solid state output contacts are rated for 0.30A @ 135V AC/DC. This “universal” output makes this product especially well suited for PLC control systems or a variety of load connections.

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 technology in your control systems.

Note: Unless otherwise specified, the term “load” refers to the current being monitored.

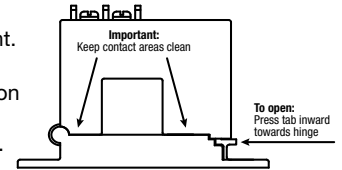
INSTALLATION

Considerations for all ECS7 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 a wire with a wire tie.
- Be sure to leave at least one inch distance between sensor and other magnetic devices.

Considerations for split-core models only...

- Press the tab in the direction shown in the diagram to the right.
- 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 split-core contact areas clean. Silicon grease is factory applied on the mating surfaces to prevent rust and improve performance. Be careful not to allow grit or dirt into the grease in the contact area, particularly on core mating surfaces of split core models. Sensor operation could be impaired if mating surfaces do not have good contact. Check visually before closing.



QUICK INSTALL GUIDE

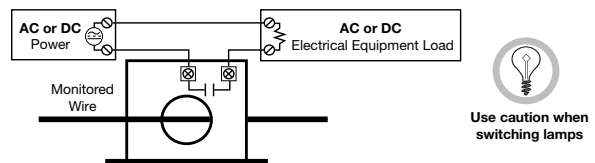
The below steps can be followed to quickly install a CurrentWatch™ ECS7 Series switch.

1. Run the wire to be monitored through the aperture
 2. Mount the sensor
 3. Connect output wire to the solid state relay terminals
 - a. Use up to 14 AWG copper wires
 - b. Don't exceed output rating
 4. Slide the Function Switch from “CLR” to “RUN”
 5. Turn load “on”, equipment is now energized and sensor is calibrated
- *Note: Refer to the LED Indication table on page two for switch operation.*

WIRING DIAGRAM

Connect control or monitoring wires to the sensor. Use up to 14 AWG copper wire and tighten terminals to 7 inch-pounds torque. Be sure the output load does not exceed the solid state output rating.

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



SETPOINT ADJUSTMENT

The CurrentWatch™ ECS7 Series has an internal microprocessor that “learns” your load characteristics and calibrates the setpoint and setpoint window.

Initial Calibration

1. This product is shipped from the factory with Function Switch in the “CLR” position, which clears the memory.
2. After installation is complete and the output is connected properly, slide this switch into the “RUN” position.
3. Turn on the load. The LED indicator marked “CALIB/ALARM” will flash slowly (about one flash every two seconds) during the learning period. When this LED goes out, the sensor has been calibrated.

Re-Calibration

If the load or conditions change, you may need to recalibrate the sensor. Below are the steps for doing so.

1. Safety first—turn load power off before recalibrating.
 2. Slide the Function Switch to the “CLR” position.
 3. Turn the load power back on for five seconds, then turn it off. This clears the memory.
 4. Slide the Function Switch to the “RUN” position.
 5. Turn the load back on. The sensor is now re-calibrated.
- *Note: For special situations, re-calibration can be performed while the load is running. **Exercise extreme caution when placing your hands into a high voltage environment!** With the load running, flip the Function Switch to the “CLR” position, wait five seconds, then move the Function Switch back to the “RUN” position. The sensor will then re-calibrate.*

LED INDICATION

State	Contact LED	Calibration LED
Off	Load off or below threshold. Caution! Load power may be on!	Sensor is operating normally or is off.
Slow Flash (Once Every Two Seconds)	Output open, normal state.	Sensor is learning the load and self-calibrating.
Fast Flash (About Two Flashes Per Second)	Switch is tripped, output closed.	Calibration error. Perform re-calibration.

CURRENT SWITCH OPERATION

Model	Output Diagram
Underload Only Models	
Overload Only Models	
Over/Underload Models	

RANGES AND MAXIMUM AMPS

Housing	Range	Maximum Amps		
		Continuous	6 sec.	1 sec.
Solid Core	1.5-150A	500A	500A	1,000A
Split Core	2.8-150A	500A	500A	1,000A

TROUBLESHOOTING

Problem	Solution
Switch is always tripped	Switch may have been overloaded and contacts are burned out. Check the output load, remembering to include inrush on inductive loads (coils, motors).
Switch will not trip	For split core models, the core contact area may be dirty. Open the sensor and clean the contact area.
	Switch may have been overloaded and contacts are burned out. Check the output load, remembering to include inrush on inductive loads (coils, motors).
	Make sure function switch is in “RUN” mode.

SPECIFICATIONS

Specification	Value
Power Supply	Self Powered—No Power Supply Needed
Output	Magnetically Isolated Solid State Switch
Output Rating	Normally Open (N.O.) Models: 0.30A @ 135V AC/DC
Off-State Leakage	< 10 µA
Response Time	200 ms
Setpoint	Overload Only Models: +15% of Load Underload Only Models: -15% of Load Over/Underload Models: ±15% of Load (Operating Window)
Setpoint Ranges	Solid Core: 1.5-150A Split Core: 2.8-150A
Hysteresis	Approx. 5% of Setpoint
Isolation Voltage	UL Listed to 1,270V AC, Tested to 5,000V AC
Frequency Range	6-100Hz
Sensing Aperture	Solid Core Models: 0.75 in. (19mm) dia. Split Core Models: 0.85 in. (21.7mm) sq.
Housing	UL94 V0 Flammability Rated
Environmental	Operating Temperature: -58 to +149° F (-50 to +65° C) Humidity: 0-95% RH, Non-Condensing
Approvals	UL and ULC Listed CE Certified