

Installation Instructions

CurrentWatch™ EGF Series Ground Fault Sensors

120V AC Powered, N.O. or N.C., Solid State Relay Output



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 TO THE CORRECT POWER SUPPLY FOR THE APPLICATION. REFER TO THE SPECIFICATIONS AND WIRING DIAGRAMS IN THIS MANUAL.**

MODELS COVERED IN THIS MANUAL

Catalog Number	Description
EGF1NOACNE050	N.O. 1A @ 240V AC, Normally Energized, 50 mA Range
EGF1NOACDE050	N.O. 1A @ 240V AC, Normally De-Energized, 50 mA Range
EGF1NCACNE050	N.C. 1A @ 240V AC, Normally Energized, 50 mA Range
EGF1NCACDE050	N.C. 1A @ 240V AC, Normally De-Energized, 50 mA Range
EGF1NOACNE100	N.O. 1A @ 240V AC, Normally Energized, 100 mA Range
EGF1NOACDE100	N.O. 1A @ 240V AC, Normally De-Energized, 100 mA Range
EGF1NCACNE100	N.C. 1A @ 240V AC, Normally Energized, 100 mA Range
EGF1NCACDE100	N.C. 1A @ 240V AC, Normally De-Energized, 100 mA Range
EGF1NODCNE050	N.O. 0.15A @ 30V DC, Normally Energized, 50 mA Range
EGF1NODCDE050	N.O. 0.15A @ 30V DC, Normally De-Energized, 50 mA Range
EGF1NCDCNE050	N.C. 0.15A @ 30V DC, Normally Energized, 50 mA Range
EGF1NCDCDE050	N.C. 0.15A @ 30V DC, Normally De-Energized, 50 mA Range
EGF1NODCNE100	N.O. 0.15A @ 30V DC, Normally Energized, 100 mA Range
EGF1NODCDE100	N.O. 0.15A @ 30V DC, Normally De-Energized, 100 mA Range
EGF1NCDCNE100	N.C. 0.15A @ 30V DC, Normally Energized, 100 mA Range
EGF1NCDCDE100	N.C. 0.15A @ 30V DC, Normally De-Energized, 100 mA Range
EGF3NOACNET3	N.O. 1A @ 240V AC, Normally Energized, 5/10/30 mA Range
EGF3NOACDET3	N.O. 1A @ 240V AC, Normally De-Energized, 5/10/30 mA Range
EGF3NODCNET3	N.O. 0.15A @ 30V DC, Normally Energized, 5/10/30 mA Range
EGF3NODCDET3	N.O. 0.15A @ 30V DC, Normally De-Energized, 5/10/30 mA Range
EGF3NCACNET3	N.C. 1A @ 240V AC, Normally Energized, 5/10/30 mA Range
EGF3NCACDET3	N.C. 1A @ 240V AC, Normally De-Energized, 5/10/30 mA Range
EGF3NCDCNET3	N.C. 0.15A @ 30V DC, Normally Energized, 5/10/30 mA Range
EGF3NCDCDET3	N.C. 0.15A @ 30V DC, Normally De-Energized, 5/10/30 mA Range

INTRODUCTION

The CurrentWatch™ EGF Series is a family of ground fault (earth leakage) sensors. Ground fault sensors help protect people, products, and processes from damage by ground fault conditions by monitoring all current-carrying conductors in grounded single- and three-phase delta or wye systems. They provide a contact output that can operate relays, contactors or signal automation systems.

Note that this manual only covers solid state versions of the EGF Series (listed in the table to the left). For installation manuals covering other models in the EGF Series family, please contact Eaton's Cutler-Hammer Sensor Application Engineers.

QUICK INSTALL GUIDE

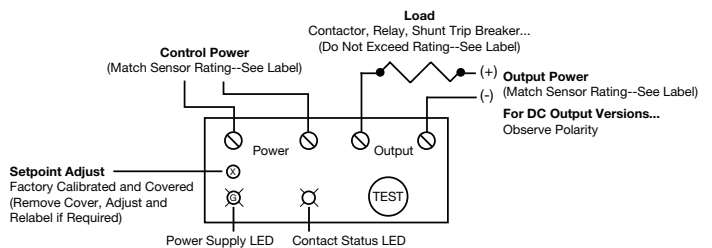
The below steps can be followed to quickly install a CurrentWatch™ EGF Series switch.

1. Run all current carrying conductors through sensor window, using an auxiliary current transformer if conductors do not fit
2. Mount the sensor to a surface if needed
3. Connect output and power wiring
 - a. Use up to 14 AWG copper wires
 - b. Ensure power and load matches those shown on the sensor label
4. Test the unit
 - a. Pressing the "TEST" button will test the sensor's internal circuits (*CAUTION: The output and any connected loads will switch during the test process*)

INSTALLATION AND WIRING

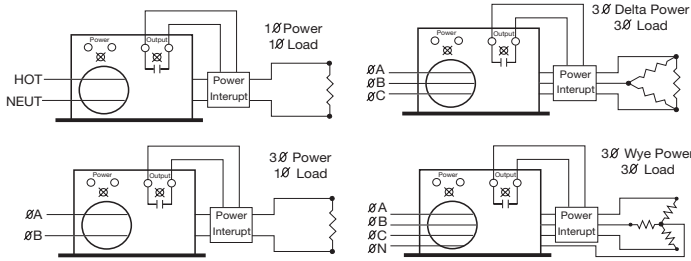
Considerations for installing and wiring EGF Series sensors...

- Run wire to be monitored through the aperture (opening) in the switch body, making sure all wires are oriented so that current flows in the same direction (see "Principal of Operation" section on reverse side)
- These sensors 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
- Connect power and output wiring to the sensor, using up to 14 AWG copper wire and tightening terminals to 7 inch-pounds torque
- Make sure the power supply matches the power rating on the sensor label
- Make sure the output load is less than or equal to the output rating on the sensor label



PRINCIPAL OF OPERATION

Under normal conditions, the current in one wire of a two wire load is equal in strength but opposite in sign to the current in other wire. The two wires create magnetic fields that cancel, a condition known as “Zero Sum Current.” If any current leaks to ground (Ground Fault), the two currents become unbalances and there is a net resulting magnetic field. The EGF Series sensor detects this minute field and change the output state. This concept extends to three phase systems such as 3-wire Delta and to 4-wire Wye.



OPERATION

To test operation, gently press the TEST button. This simulates a fault and tests the internal switching circuits. The following operation should be observed. *CAUTION: Any circuit connected to the sensor will be operated.*

Normally Energized Models

Used for detecting ground faults and loss of control power.

Output	No Power		Control Power Applied			
			No Fault		Fault Detected	
	Output	LED	Output	LED	Output	LED
N.C.	Closed	Off	Open	On	Closed	Off
N.O.	Open	Off	Closed	On	Open	Off

Normally De-Energized Models

Used for detecting ground faults only.

Output	No Power		Control Power Applied			
			No Fault		Fault Detected	
	Output	LED	Output	LED	Output	LED
N.C.	Closed	Off	Closed	Off	Open	On
N.O.	Open	Off	Open	Off	Closed	On

SETPOINT ADJUSTMENT

The EGF Series sensors are factory calibrated to trip at the setpoint specified by the model number. While it is generally recommended not to change this setpoint, it can be done by following the below steps.

1. Connect control power and circuits. Run a conductor through the aperture with current equal to your desired setpoint.
2. Adjust setpoint to maximum by first removing the setpoint cover. Turn the adjustment pot four revolutions counter-clockwise to the maximum (least sensitive) setpoint. The Status LED should be off. The adjustment pot has a slip clutch so that you cannot feel or damage the end point.
3. Dial in the new setpoint by slowly turning the pot clockwise until the LED turns on. The sensor is now adjusted to trip at the current that is passing through the aperture. Reset the sensor.
4. Relabel the sensor with a new setpoint. Use a label maker or tape with a permanent marker.

POWER SUPPLY NOTES

All low-current ground-fault sensors are sensitive devices that require reasonable care in system design to avoid false trips caused by high electrical noise levels. Keep in mind that the best way to reduce noise in a system is to suppress it at its source.

- Keep the sensor power isolated from noisy circuits
- Do not power the sensor with the same circuit that switches contactors or other high current inductive loads

SYSTEM GROUNDING

Good design practice and code require that all AC power systems be grounded. The EGF Series sensors are designed to work on grounded AC power systems. They may not operate properly on ungrounded systems.

SPECIFICATIONS

Specification	Value
Power Supply	120V AC (Operates from 66-132V)
Voltage Range	Up to 1,500V AC (Monitored Circuit)
Power Consumption	2.5W
Output	Magnetically Isolated Solid State Switch
Output Rating	AC Models: 1A @ 240V AC (2A for 10 Min.) DC Models: 0.15A @ 30V DC (500 mA Momentary)
Response Time	At 5% Over Setpoint: 150 ms At 50% Over Setpoint: 100 ms
Setpoint Range	Models Ending -T3: 5, 10 or 30 mA (Adjustable by Jumper) All Other Models: 50 or 100 mA (See "Setpoint Adjustment")
Frequency Range	50-400Hz (Monitored Circuit)
Housing	UL94 V0 Flammability Rated
Dimensions	Housing: 2.5 in. H x 2.8 in. W x 1.5 in. D (64x71x38mm) Aperture: 0.75 in. (19mm)
LED	Green = Power Supply Energized
Environmental	Operating Temperature: +5 to +158° F (-15 to +70° C) Humidity: 0-95% RH, Non-Condensing
Approvals	UL1053, Class 1 Recognized CE Certified