

EGF Series Ground Fault Sensors
CurrentWatch Current Sensors

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The CurrentWatch EGF Series from Eaton's electrical business 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. The EGF Series is available with either solid-state or mechanical relay outputs.

The EGF Series with solid-state outputs offers the benefit of reliable, long-lasting solid-state switches. Solid-state design provides unlimited switch operating life, superior resistance to shock and vibration, zero off-state leakage, high switch speeds and high input-output isolation. Solid-state outputs have solid-core housings with screw terminals.

The EGF Series with mechanical relay outputs are available in solid-core housings with a choice of N.O. or N.C. SPST latching relays and a SPDT Form C relay with auto-reset. All mechanical models can be ordered with a fixed setpoint or with a "tri-set" option, which provides three factory-set, field-adjustable setpoints.

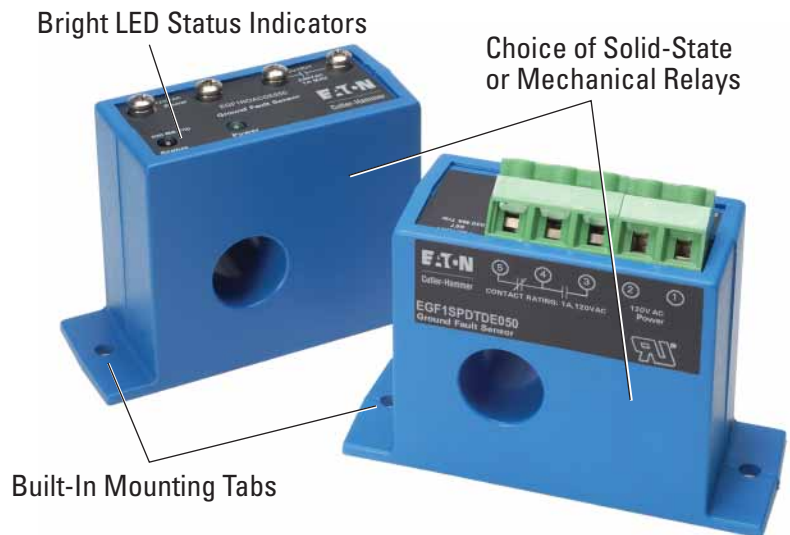
Approvals

- UL Recognized



Unless otherwise noted, the products contained in this document are not designed or intended for use in human safety applications.

Ground Fault Sensors with Solid-State or Mechanical Relay Outputs



Product Features

- **Broad Range of Options to Meet Application Needs** — N.O. or N.C., solid-state or mechanical relays, normally energized or normally de-energized contacts
- **Setpoint Options Maximize Ease-of-Use and Application Flexibility** — Field selectable 5, 10 or 30 mA setpoints on the EGF "Tri-set" models make user adjustments fast, sure and convenient
- **Compatible with Standard Equipment** — Application on single- and three-phases systems, ideal for use with shunt trip breakers, and magnetically isolated from monitored circuit and control power
- **Agency Approved** — UL and CE Certified, accepted worldwide

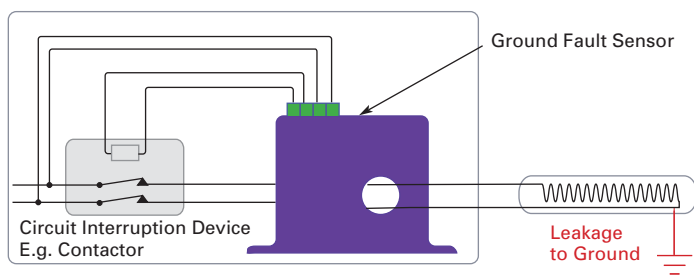
Typical Applications

- **Personnel Protection (Typically 5 mA)** — Detects sensitive ground fault conditions, which could cause injury to people, and functions as a sensor and alarm trigger when applied as an input to an overall ground fault protection system
- **Equipment Protection (Typically 10 or 30 mA)** — For applications where personnel protection is not the primary concern, higher setpoint capability helps eliminate nuisance tripping while still providing adequate ground fault detection to protect machine electronics
- **Regulatory** — Meets requirements as stipulated by governmental and industrial regulatory groups for ground fault sensing

"Zero Sum" Operating Principle

In three-phase delta and wye systems, under normal conditions, current in the "hot" leg of a two-wire load is equal in magnitude but opposite in sign to the current in a neutral leg. As a result, the electromagnetic fields surrounding these two conductors cancel, producing a "zero sum current." As soon as current leaks to ground (fault condition), the two currents become imbalanced and a net magnetic field results. The CurrentWatch EGF Series sensors monitor this field and trips the contacts when the leakage rises above the setpoint.

For Customer Service in the U.S. call **1-877-ETN CARE (386-2273)**,
in Canada call **1-800-268-3578**.
For Application Assistance in the U.S. and Canada
call **1-800-426-9184**.

Example Application — CurrentWatch EGF Series
Insulation Breakdown Monitoring

Model Selection — CurrentWatch EGF Series

	Power Supply	Setpoint	AC Solid-State Output	DC Solid-State Output	Contacts	Catalog Number
Solid-State Output Sensors						
	120V AC	Fixed, 50 mA	Solid-State, N.O., 1A @ 240V AC	—	Normally Energized	EGF1NOACNE050
					Normally De-energized	EGF1NOACDE050
			Solid-State, N.C., 1A @ 240V AC	—	Normally Energized	EGF1NCACNE050
					Normally De-energized	EGF1NCACDE050
			—	Solid-State, N.O., 0.15A @ 30V DC	Normally Energized	EGF1NODCNE050
					Normally De-energized	EGF1NODCDE050
			—	Solid-State, N.C., 0.15A @ 30V DC	Normally Energized	EGF1NCDCNE050
					Normally De-energized	EGF1NCDCDE050
		Fixed, 100 mA	Solid-State, N.O., 1A @ 240V AC	—	Normally Energized	EGF1NOACNE100
					Normally De-energized	EGF1NOACDE100
			Solid-State, N.C., 1A @ 240V AC	—	Normally Energized	EGF1NCACNE100
					Normally De-energized	EGF1NCACDE100
			—	Solid-State, N.O., 0.15A @ 30V DC	Normally Energized	EGF1NODCNE100
					Normally De-energized	EGF1NODCDE100
			—	Solid-State, N.C., 0.15A @ 30V DC	Normally Energized	EGF1NCDCNE100
					Normally De-energized	EGF1NCDCDE100
		Tri-Set Adjustable, 5, 10 or 30 mA	Solid-State, N.O., 1A @ 240V AC	—	Normally Energized	EGF3NOACNET3
					Normally De-energized	EGF3NOACDET3
			Solid-State, N.C., 1A @ 240V AC	—	Normally Energized	EGF3NCACNET3
					Normally De-energized	EGF3NCACDET3
			—	Solid-State, N.O., 0.15A @ 30V DC	Normally Energized	EGF3NODCNET3
					Normally De-energized	EGF3NODCDET3
			—	Solid-State, N.C., 0.15A @ 30V DC	Normally Energized	EGF3NCDCNET3
					Normally De-energized	EGF3NCDCDET3

Stocked product, typical order quantities guaranteed in stock.

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Model Selection — CurrentWatch EGF Series (Continued)

	Power Supply	Setpoint	Mechanical Relay Output	Contacts	Catalog Number
Mechanical Relay Output Sensors					
	120V AC	Fixed, 50 mA	Mechanical Relay, N.O. SPST Relay, Form A (1A @ 120V AC)	Latching Relay	EGF1NOLA050
			Mechanical Relay, N.C. SPST Relay, Form B (1A @ 120V AC)	Latching Relay	EGF1NCLA050
			Mechanical Relay, SPDT Form C, Auto-Reset (1A @ 120V AC)	Normally Energized	EGF1SPDTNE050
				Normally De-energized	EGF1SPDTDE050
		Fixed, 100 mA	Mechanical Relay, N.O. SPST Relay, Form A (1A @ 120V AC)	Latching Relay	EGF1NOLA100
			Mechanical Relay, N.C. SPST Relay, Form B (1A @ 120V AC)	Latching Relay	EGF1NCLA100
			Mechanical Relay, SPDT Form C, Auto-Reset (1A @ 120V AC)	Normally Energized	EGF1SPDTNE100
				Normally De-energized	EGF1SPDTDE100
		Tri-set Adjustable, 5, 10 or 30 mA	Mechanical Relay, N.O. SPST Relay, Form A (1A @ 120V AC)	Latching Relay	EGF1NOLAT3
			Mechanical Relay, N.C. SPST Relay, Form B (1A @ 120V AC)	Latching Relay	EGF1NCLAT3
			Mechanical Relay, SPDT Form C, Auto-Reset (1A @ 120V AC)	Normally Energized	EGF1SPDTNET3
				Normally De-energized	EGF1SPDTDET3
	24V AC/DC	Fixed, 50 mA	Mechanical Relay, N.O. SPST Relay, Form A (2A @ 30V DC)	Latching Relay	EGF2NOLA050
			Mechanical Relay, N.C. SPST Relay, Form B (2A @ 30V DC)	Latching Relay	EGF2NCLA050
			Mechanical Relay, SPDT Form C, Auto-Reset (2A @ 30V DC)	Normally Energized	EGF2SPDTNE050
				Normally De-energized	EGF2SPDTDE050
		Fixed, 100 mA	Mechanical Relay, N.O. SPST Relay, Form A (2A @ 30V DC)	Latching Relay	EGF2NOLA100
			Mechanical Relay, N.C. SPST Relay, Form B (2A @ 30V DC)	Latching Relay	EGF2NCLA100
			Mechanical Relay, SPDT Form C, Auto-Reset (2A @ 30V DC)	Normally Energized	EGF2SPDTNE100
				Normally De-energized	EGF2SPDTDE100
		Tri-set Adjustable, 5, 10 or 30 mA	Mechanical Relay, N.O. SPST Relay, Form A (2A @ 30V DC)	Latching Relay	EGF2NOLAT3
			Mechanical Relay, N.C. SPST Relay, Form B (2A @ 30V DC)	Latching Relay	EGF2NCLAT3
			Mechanical Relay, SPDT Form C, Auto-Reset (2A @ 30V DC)	Normally Energized	EGF2SPDTNET3
				Normally De-energized	EGF2SPDTDET3

Stocked product, typical order quantities guaranteed in stock.

Accessories — CurrentWatch EGF Series

	Description	Catalog Number
	DIN Rail Mounting Kit (Sensor pictured for reference and not included in kit)	EDINKIT

Stocked product, typical order quantities guaranteed in stock.

Output Table — CurrentWatch EGF Series
Normally Energized Models

Protection from faults and control power loss.

		Control Power Applied	
	No Power	No Fault	Fault
Normally Open Models	Open	Closed	Open
Normally Closed Models	Closed	Open	Closed

Normally De-energized Models

Protection from faults only when power is applied.

		Control Power Applied	
	No Power	No Fault	Fault
Normally Open Models	Open	Open	Closed
Normally Closed Models	Closed	Closed	Open

Latching (Mechanical Relay Output) Models

Latching models power up initially in the rest (normal) mode. If there is a fault condition or the test button is pushed, the output contacts will change state and latch. The output will remain latched regardless of whether the fault is cleared or control power is removed. To reset the output, apply a momentary contact across "reset" terminals.

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Wiring Diagrams — CurrentWatch EGF Series

Models	Wiring Diagrams
Solid-State Output Models	
Mechanical Relay Output Models	Latching Models Auto Reset Models

Specifications — CurrentWatch EGF Series

Description	Solid-State Output Models	Mechanical Relay Output Models
Power Supply	120V AC (55 – 110% of nominal voltage) 24V AC/DC ($\pm 20\%$)	
Output Contact Type	Isolated Dry Contact	Mechanical Relay
Output Rating (Switching Current and Switching Voltage)	AC Output Switching Models: 1A @ 240V AC DC Output Switching Models: 0.15A @ 30V DC	Auto Reset Models: SPDT Relay 1A @ 120V AC 2A @ 30V DC Latching Models: SPST Relay 1A @ 120V AC 2A @ 30V DC
Off-State Leakage	N.O. Models: < 10 μ A N.C. Models: < 2.5 mA	None
Response Time	200 ms @ 5% above trip point 60 ms @ 50% above trip point 15 ms @ 500% above trip point	
Frequency Range	50 – 400 Hz (monitored circuit)	
Loading	2 VA max.	
Isolation Voltage	5,000V AC (tested)	
Sensing Aperture	0.74 in. (19 mm) dia.	
LED Indicator	Green LED for Power On Status; Red LED for Contact Status	
Housing	UL94 V0 Flammability Rated	
Environmental	Operating Temperature: -4 to 122°F (-20 to 50°C) Humidity: 0 – 95% RH, Non-condensing	
Approvals	UL 1053, Class 1 Recognized, CE	

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Approximate Dimensions — CurrentWatch EGF Series

Models	Approximate Dimensions in Inches (mm)
Solid-State Output Models	0.20 (5.1) Dia. 2.90 (73.7) 3.38 (86) 1.50 (38) 0.75 (19.1) Dia. 2.50 (63)
Mechanical Relay Models	2.25 (57.2) 1.88 (47.6) 0.44 (11.2) 0.75 Dia (19.1) 2.50 (63.5) 3.88 (98.6) 0.20 Dia (5.1) 2.90 (73.7) 3.38 (85.9) Auto Reset (6 Terminals) Latching (7 Terminals) TEST