Specifications	
Monitored Circuit	1500 VAC max, 50-400 Hz
Output	Mechanical Relay
Rating	Auto-Reset: SPDT Relay, 1A @ 125 VAC, 2A @ 30 VDC
	Manual-Reset: SPST Relay, 1A @ 125 VAC, 2A @ 30 VDC
Off State Leakage	None
Power Supply	• 120 VAC (66-132 VAC), 50/60 Hz • 24 VAC/DC (20.4-27.6 VAC or 19.2-30 VDC)
Power Consumption	2.5VA max.
Setpoints	5, 10 and 30 mA jumper select
Response Time	200 mS @ 5% above setpoint
Isolation Voltage	5KV (tested)
Case	UL 94V-0 Flammability Rated
Dimensions	2.5" H x 2.8" W x 1.5" D, (64 x 71 x 38 mm), aperture is 0.75" (19 mm) diameter
Environmental	-4 to 122 °F (-20 to 50 °C) operating temperature, 0-95% RH, Non-condensing humidity
Listings	UL 1053, Class 1 Recognized File #E343037, CE Certified

Power Supply Notes

All low-current Ground-Fault Sensors are sensitive devices and require reasonable care in system design to avoid false trips caused by high electrical noise levels. The best way to reduce noise in a system is to suppress it at its source.

1. Keep the sensor power isolated from noisy circuits.
2. 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. GFS series sensors are designed to work on grounded AC power systems. They may not operate properly on underground systems.

Part Number Key

GFS 30 - M1B - 24 - F

- GFS — SENSOR TYPE: Ground Fault Sensor
- 30 — SETPOINT: 30 = 5, 10 and 30 mA, Jumper Select
- M1B — OUTPUT:
  - M1A = Single Pole Single Throw (SPST), N.O. Relay, manual reset
  - M1B = Single Pole Single Throw (SPST), N.C. Relay, manual reset
  - D1C = Single Pole Double Throw (SPDT) Relay, normally de-energized, auto-reset
  - E1C = Single Pole Double Throw (SPDT) Relay, normally energized, auto-reset
- 24 — VOLTAGE:
  - 24 = 24 VAC/DC
  - 120A = 120 VAC
- F — CASE STYLE: F - Fixed Core

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GFS - Inst - Rev 2 1018 P-N 490381424

ACUAMP®

GFS SERIES INSTALLATION INSTRUCTIONS

Quick Start Guide

1. Run <u>all</u> current carrying conductors through sensor window.
2. Mount the sensor to a surface if needed.
3. Connect power and output wiring.
   - A. Use up to 14 AWG copper wires.
   - B. Ensure load matches the output shown on the sensor label.
4. Test the sensor.
   - A. Press the "Test" button to test the sensor's internal circuits.

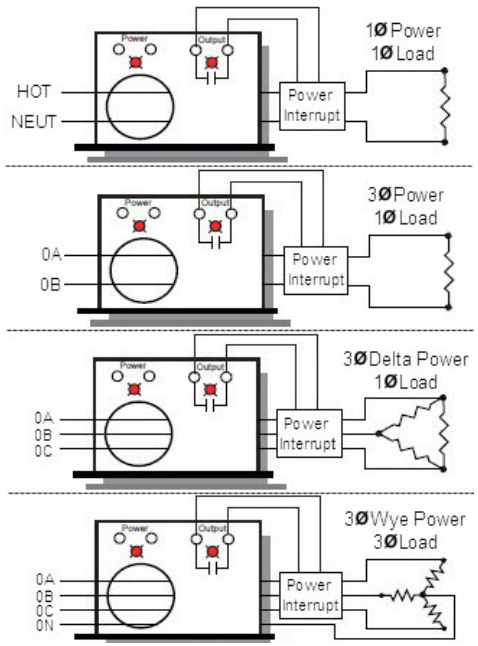
CAUTION: THE OUTPUT AND ANY CONNECTED LOADS WILL SWITCH!

Description

GFS Series sensors monitor all current carrying wires in single or three phase systems to detect ground faults. They provide a contact output that can operate relays and contactors or signal automation systems.

Principal of Operation

Under normal conditions, the current in one wire of a two wire load is equal in strength but opposite in polarity to the current in the 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 unbalanced and there is a net resulting magnetic field. The GFS sensor detects this minute field and changes the output state. This concept extends to three-phase systems such as 3-wire Delta and to 4-wire Wye.



Installation and Wiring

GFS Series sensors work in the same environment as motors, contactors, heaters, pull-boxes, and other electrical enclosures. They can be mounted in any position or hung directly on wires with a wire tie. Leave at least one inch distance between sensor and other magnetic devices.

Run all current carrying conductors through the sensor aperture in the same direction (see "Principal of Operation").

Power Wiring

Connect power wiring to Terminals 1 and 2. Use up to 10 AWG copper wire for M1A and M1B models and up to 14 AWG for D1C and E1C models. Tighten terminals to 4.5 inch-pounds of torque for M1A and M1B models and 7 inch-pounds for D1C and E1C models.

Output Wiring

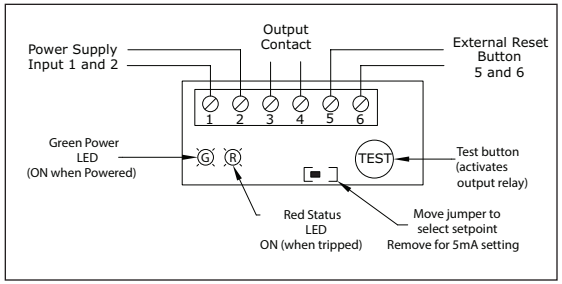
Connect output wiring to Terminals 3 and 4. Use up to 10 AWG copper wire for M1A and M1B models and up to 14 AWG for D1C and E1C models. Tighten terminals to 4.5 inch-pounds of torque for M1A and M1B models and 7 inch-pounds for D1C and E1C models.

Reset Switch Wiring (M1A/M1B models only)

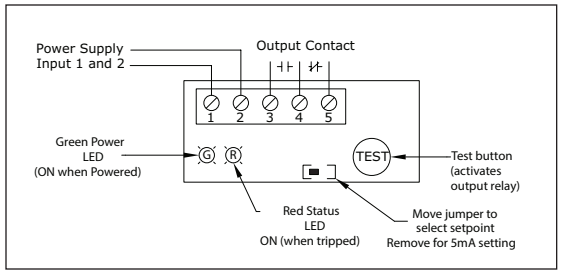
Connect a momentary dry contact to the reset terminals (5 and 6). Limit wire run to 200 feet of 18 AWG or larger wire. Tighten terminals to 4.5 inch-pounds of torque.

Diagrams

M1A and M1B Models



D1C and E1C Models



Testing:

To test operation, gently press the TEST button. This simulates a fault and tests the internal switching circuits. After the test is complete, reset the sensor with a momentary dry contact on Terminals 5 and 6 for manual reset models M1A and M1B. Auto Reset models D1C and E1C will reset when the test button is released.

CAUTION: ANY CIRCUIT CONNECTED TO THE SENSOR WILL BE OPERATED.

Operation/Setup

Auto Reset Sensors (E1C and D1C)

GFS Auto Reset sensors monitor all current carrying conductors and will trip when a ground fault is sensed. The output of these sensors will automatically reset when the ground fault condition is cleared. Select from three factory calibrated setpoints by moving the setpoint jumper to the desired position.

- **5mA setpoint: Detect sensitive ground fault conditions that may be injurious to personnel or processes. Remove jumper for lowest setting of 5mA**
- **10 mA and 30 mA setpoints: These higher setpoints help eliminate nuisance tripping while still providing adequate ground fault protection for machine electronics.**

Normally Energized Models (E1C)

Used to detect both ground faults and loss of control power.

	NO POWER		CONTROL POWER APPLIED			
			No Fault		Fault Detected	
	Output	LED	Output	LED	Output	LED
N.C. Normally Closed	Closed	OFF	Open	OFF	Closed	ON
N.O. Normally Open	Open	OFF	Closed	OFF	Open	ON

Normally De-energized Models (D1C)

Used to detect ground faults.

	NO POWER		CONTROL POWER APPLIED			
			No Fault		Fault Detected	
	Output	LED	Output	LED	Output	LED
N.C. Normally Closed	Closed	OFF	Closed	OFF	Open	ON
N.O. Normally Open	Open	OFF	Open	OFF	Closed	ON

Manual Reset Sensors

GFS Manual Reset Sensors monitor all current carrying conductors and will trip when a ground fault is sensed. When the output of these sensors trips it will latch in the tripped position even after the ground fault is cleared. If control power is removed, the sensor remains in its last output state. To reset the sensor, the ground fault condition must be removed and a momentary dry contact closed at the reset terminals (5 and 6).

- **For model with M1A suffix: The contact is normally open with no ground fault condition, and closed when a ground fault is sensed.**
- **For model with M1B suffix: The contact is normally closed with no ground fault condition, and open when a ground fault is sensed.**