

Specifications	
<b>Monitored Circuit</b>	600VAC line-to-line max., 50-60Hz
<b>Output Description</b>	Electromechanical relay
<b>Rating</b>	SPST latching relay: 1.0 A @ 120VAC, 2A @ 30VDC
<b>Off State Leakage</b>	None
<b>Power Supply</b>	120VAC (66-132 VAC) 50/60 Hz
<b>Power Consumption</b>	2.5 Watts
<b>Setpoint</b>	5, 10 & 30 mA, Jumper select
<b>Response Time</b>	200ms @ 5% over setpoint 60ms @ 50% over setpoint 15ms @ 500% over setpoint
<b>Status (Red) LED</b>	Relay has tripped (relay operated)
<b>Power (Green) LED</b>	Power supply energized
<b>Aperture</b>	1.82" (46mm) ID
<b>Isolation Voltage</b>	UL tested to 1,048VAC
<b>Case</b>	UL 94V-0 Flammability Rating
<b>Environmental</b>	Operating temperature: -4 to 122°F (-20 to 50°C)
	Relative humidity: 0-95% RH, Non-condensing
	Pollution Degree 2
	Altitude to 2000 meters
<b>Agency Approvals</b>	UL/cUL (E222847), CE

**For products intended for the EU market, the following is applicable to the CE compliance of the product:**

The GFSL series comply with EN61010-1 CAT III 300V max line-to-neutral measurement category. If insulated cable is used for the primary circuit, the voltage rating of the measurement category can be improved according to the characteristics given by the cable manufacturer. Use twisted pair for all connections. De-energize power before changing set point jumper position.

**120VAC 50/60Hz  
Power Supply**

Fuse at 5 amps maximum

Overvoltage Category II



**WARNING! RISK OF DANGER:**  
SAFE OPERATION CAN ONLY BE GUARANTEED IF THE SENSOR IS USED FOR THE PURPOSE IT WAS DESIGNED FOR AND WITHIN LIMITS OF THE TECHNICAL SPECIFICATIONS. WHEN THIS SYMBOL IS USED, IT MEANS YOU MUST CONSULT ALL DOCUMENTATION TO UNDERSTAND THE NATURE OF POTENTIAL HAZARDS AND THE ACTION REQUIRED TO AVOID THEM.



**WARNING! RISK OF ELECTRICAL SHOCK:**  
WHEN OPERATING THE SENSOR CERTAIN PARTS MAY CARRY HAZARDOUS LIVE VOLTAGE (E.G. PRIMARY CONDUCTOR, POWER SUPPLY). THE SENSOR SHOULD NOT BE PUT INTO OPERATION IF THE INSTALLATION IS NOT COMPLETE.

**Part Number Key**

**GFSL30 - M1B - 120A - F**

**OPTIONS**  
F Fixed Core

**POWER SUPPLY**  
120A 120 VAC

**OUTPUT TYPE**

M1A SPST (Normally open, closes on fault, latching)  
M1B SPST (Normally closed, opens on fault, latching)

**GROUND FAULT SENSOR LARGE APERTURE**

**Description**

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

**Principle 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 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 GFSL relay 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. The sensor is not designed for use on ungrounded Delta systems.

**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.

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.

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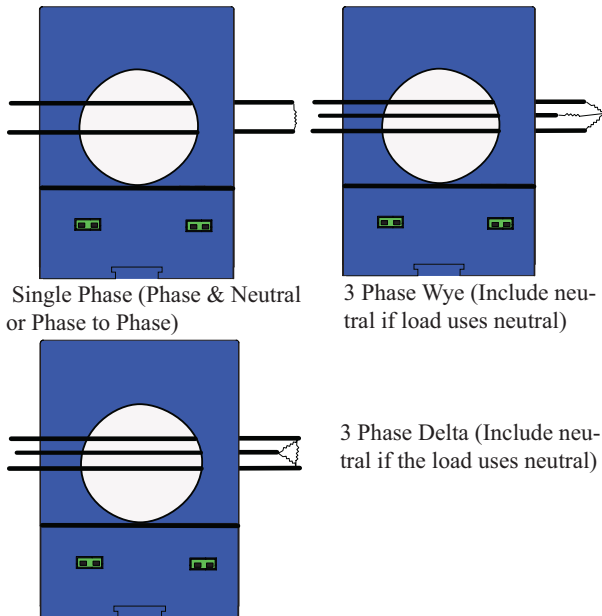
Fax: (770) 889-7876

GFSL - Inst - Rev 2 0719 P-N 490680012



**Quick Start Guide**

1. Run all current carrying conductors through relay window.
  - A. Set range selection jumper before installing any power or output conductors.
2. Mount the relay to a surface if needed.
3. Connect output & power wiring.
  - A. Use 30AWG (0.051mm<sup>2</sup>) up to 14AWG (2.5mm<sup>2</sup>) insulated to 75/90°C copper wires.
  - B. Make sure power and load matches those shown on the sensors' label.
4. Power up
  - A. The Green LED will light when the sensor is powered.
  - B. Energize the monitored circuit.
4. Test
  - A. Pressing the "TEST" button tests the sensors internal circuits.  
Caution: The output and any connected loads will switch!
  - B. Reset by shorting between term. 1-2, use an insulated push button or similar with no voltage connected.



## Installation & Wiring

GFSL 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. Just leave at least one inch distance between sensor and other magnetic devices. Run all current carrying conductors through the opening in the sensor. (See "Operation") Be Sure all wires are oriented so current flows in the same direction.

### Reset Switch

Connect a momentary dry contact to the reset terminals (1&2) Limit wire run to 200' of 18AWG (0.82 mm<sup>2</sup>) or larger wire.

### Wiring

Use 30AWG (0.051mm<sup>2</sup>) up to 14AWG (2.5mm<sup>2</sup>) copper wire and tighten terminals to 5.3 in lbs (0.6 Nm) torque. See Diagram.

### Power

Connect power wiring to Terminals 3 & 4. Be sure that the power supply matches the power rating on the sensor label. Green LED (Power) will light.

### Output

Connect output wiring to Terminals 5 & 6

## Operation

GFSL series latching ground fault sensors operate in one of two states: Reset or Latched. If control power is removed, the relay remains in it's last state (latched or reset). The relay will reset if the power supply is cycled off and then on again.

To test operation, gently press the TEST button. This simulates a fault and tests the internal switching circuits.



**CAUTION: ANY CIRCUIT CONNECTED TO THE RELAY WILL BE OPERATED.**

The normally open contact closes on sensed fault current over the set point (or test) and the normally closed contact opens on detected fault.

### Reset

The relay has not detected a fault and the output is in the "normal" position.

For -M1A suffix, the contact is normally open in the reset condition.

For -M1B suffix, the contact is normally closed in the reset condition

## Operation Continued

### Latched

Upon detecting a fault or when the TEST switch is pressed, the output will switch and "latch". The output will remain latched until the ground fault is removed and the output is reset by a momentary dry contact on Terminals 5 & 6.

### 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 relay with a momentary dry contact on Terminals 1-2.



**CAUTION: ANY CIRCUIT CONNECTED TO THE RELAY WILL BE OPERATED.**

### Momentary Reset

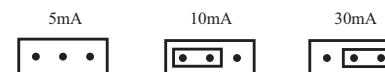
The relay will not work properly if the reset terminals are closed (shorted) continuously. Only close the reset terminals momentarily.

### Parallel Reset Connection

Multiple relays may be connected to the same reset switch in parallel. Only the relays that have detected a fault and have latched will be reset. A relay will not reset unless the fault has dropped below setpoint.

The relay will also reset if the power supply voltage is cycled off and on again.

The triple range, field selectable model uses a jumper to select the trip point. With the jumper off the pins, the relay will trip at the lowest set point. The jumper can be placed over two pins to set the trip point at the medium level, or the other two pins to be set at the highest trip point.



**Note:** The tri-set GFSL model cannot be adjusted higher nor lower than the factory settings.

When used with an external CT (current transformer), the sensor will be set to trip at a point much lower than without the CT. This set point adjustment should be done with the load passing through the CT in that application.

