

## Specifications

<b>Power Supply</b>	120VAC or 24VAC/DC (+/-10%)
<b>Consumption</b>	<4VA
<b>Output</b>	SPDT Relay, 1A @ 120VAC, 2A @ 30VDC Max
<b>Bicolor Power/Trip Indicator</b>	Green: Power on, current <setpoint Orange: Power on, current >setpoint Off: No power
<b>Response Time</b>	100ms (Current 90% over setpoint)
<b>Trip Delay</b>	0.1 to 8.0 seconds
<b>Frequency (Monitored Circuit)</b>	50-400 HZ
<b>Dimensions</b>	<b>OD (Ring)</b> 5.3" x 5.8" (134.6 x 147.3mm) <b>ID (Ring)</b> 4.00" (101.5mm) <b>Max height</b> 7.00" (177.8mm) <b>Depth</b> 3.8" (96.5mm) <b>Base</b> 3.8"L x 3.1"W x 1.5"H (96.5x78.7x38.1mm)
<b>Case</b>	UL94V-0 ABS
<b>Environmental</b>	-4 to 122 °F (-20 to 50 °C) 0-95% RH, Non Condensing Pollution Degree 2 Altitude to 2000 meters
<b>Approvals</b>	Designed for UL/CE compliance

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

The AG-LC Series comply with EN 61010-1 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 potentiometer position.

24 Volt AC or DC Power Supply	120 VAC 50/60Hz Power Supply
Fuse at 5 amps maximum	Fuse at 5 amps maximum
Overvoltage Category I	Overvoltage Category II



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## Model Number Key

**AG1 - SDT - 120 -DEN - (sss) - LC**

AGC 030-150 trip point (mA)	<u>Housing Type</u>
AGD 080-400 trip point (mA)	
<u>Contact Action</u>	
DEN Normally De-energized, Auto reset	
ENE Normally Energized, Auto reset	
LA Latching, Normally De-energized	
ELA Latching, Normally Energized	
<u>Power Supply</u>	
24U 24 VAC/DC	
120 120 VAC	
<u>Output Type</u>	
SDT SPDT (One Norm. Open & One Norm. Closed Contact)	
<u>Range</u>	
1 30-150 mA Field Adjustable	
2 80-400 mA Field Adjustable	
3 300-1500 mA Field Adjustable	
4 1.0 - 5.0 A Field Adjustable	
C 30-150 mA Factory Set	
D 80 - 400 mA Factory Set	

### AG Series Ground Fault Relay

## Description

AG-LC 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.

## Power Supply Notes

All low-current Ground-Fault Relays 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 relay power isolated from noisy circuits.
2. Do not power the relay with the same circuit that switches contactors or other high current, inductive loads.

### 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 shock

When operating the sensor certain parts may carry hazardous live voltage (e.g. primary conductors, power supply). The sensor should not be put into operation if the installation is not complete.



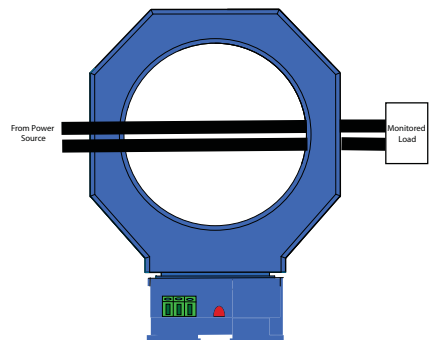
# INSTRUCTIONS



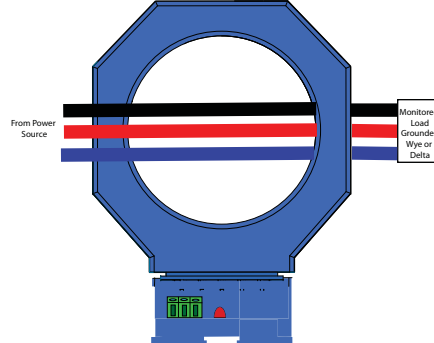
## AG-LC SERIES Large Ground Fault Sensors with Adjustable Trip and Delay

### Quick “How To” Guide

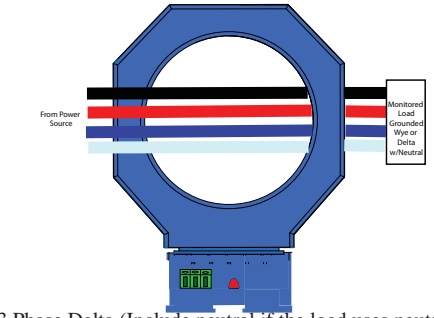
1. **Run all current carrying conductors through relay window**
  - A. Do not include the grounded conductor, but do include the neutral if the load uses one.
  - B. For best accuracy, tie wrap the wire bundle to the **top** of the sensing ring.
2. **Mount the relay to a surface if needed.**
  - A. Snap onto a DIN rail, or attach with screws through the corner holes, or both.
3. **Connect output & power wiring.**
  - A. Use 22-14 AWG insulated to 75/90°C copper wires, tighten to 5-7 inch pounds.
  - B. Make sure power and load matches those shown on the sensor's label.
4. **Power up**
  - A. The Green LED display will light when the sensor is powered.
  - B. Energize the monitored circuit.
5. **Test**
  - A. Pressing the “TEST” button tests the relay internal circuits. **CAUTION:** The output and any connected loads will switch after the delay time has elapsed! The LED will change color from Green to Orange.
  - B. Auto-reset Models: Reset by releasing the TEST button on the sensor.
  - C. Latching Models: Short between terminals 6-7 or press the reset button on the sensor base.



Single Phase (Phase & Neutral or Phase to Phase)



3 Phase Wye or Delta System must be grounded



3 Phase Delta (Include neutral if the load uses neutral)

## 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 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 AG-LC relay detects this minute field and changes the output state. This concept extends to three phase circuits such as 3 or 4 wire Delta and 3 or 4 wire Wye. The sensor is not designed for use on ungrounded systems.

## Installation & Wiring

AG-LC Series relays 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 relay and other magnetic devices. Run all current carrying conductors through the opening in the relay. (See “Principal of Operation”) Be Sure all wires are oriented so current flows to and from the load. Tie wrap the wire bundle to the top of the sensing ring with the distance from the sensor base as great as possible.

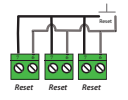
**Wiring**  
Use 22-14 AWG copper wire and tighten terminals to 5-7 inch-pounds torque. See Diagrams.

**Power**  
Connect power wiring to Terminals 1-2. Be sure that the power supply matches the power rating on the relay label. Green LED will light with power applied. The power supply input is not polarity sensitive.

**Output**  
Connect output wiring to Terminals 3-4 (NO) or 4-5 (NC) DEN and LA contacts change ONLY when current is detected over the setpoint.

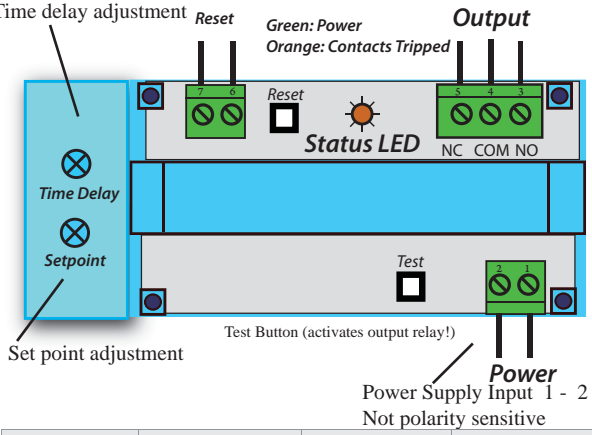
ENE and ELA contacts change state when power is applied and revert when current is detected over the setpoint or power is removed.

**Latching reset**  
Use the reset button on the sensor circuit board to unlatch the tripped sensor contact, or attach a remote, voltage free button between terminals 6-7 to allow resetting the sensor without opening the cabinet. Multiple sensors can be reset with one button by connecting in parallel.



Connect all terminal 6's and all terminal 7's in parallel to one button.

## Operation



Contact Action	No Power Applied	Power Applied	Fault Detected
DEN	NO = Open	NO = Open	NO = Closed
	NC = Closed	NC = Closed	NC = Open
ENE	NO = Open	NO = Closed	NO = Open
	NC = Closed	NC = Open	NC = Closed
LA	NO = Open	NO = Open	NO = Closed
	NC = Closed	NC = Closed	NC = Open
ELA	NO = Open	NO = Closed	NO = Open
	NC = Closed	NC = Open	NC = Closed

**AG-LC Series** Ground fault relays operate in one of two states: Normally de-energized (DEN or LA) or Normally energized (ENE or ELA). **Normally de-energized** sensors produce a change in the relay contacts ONLY when there is a fault over the trip point and unit is powered. **Normally energized** sensors provide contact action when the sensor is powered, so the contact state will return to the original condition with fault detected or with a loss of power to the sensor (auto-reset). Latching Normally energized model contacts change state when power is applied to the sensor, latching in the original condition when a fault is detected.

**Testing**  
To test operation, gently press the TEST button. This simulates a fault and tests the internal switching circuits. The TEST button must be pressed for a period of time longer than the delay setting.

**CAUTION:** Any circuit connected to the relay will be operated. The open contact closes on sensed fault current over the set point (or test), and the closed contact opens on detected fault.

Upon detecting a fault or when the TEST switch is pressed, the output will switch.

The output will reset to the original (energized) state after the TEST button has been released. With the latching models, the RESET button (external or on the sensor) must be used to unlatch the contacts.

To indicate that the sensor has sensed a fault, the LED will show orange rather than green.

**Field Setpoint Adjustment**  
The AG-LC sensors provide an easy method to set the amount of fault current which will cause the output to change state. There is a pale blue slotted adjustment knob on the side of the sensor base. This is a linear, half turn potentiometer allowing the trip point to be set at a minimum of the sensor range by turning counterclockwise, and the maximum of the range by turning clockwise. Use the markings on the label.

**Factory Setpoint**  
The AGC and AGD models trip points are factory set, no adjustment.

**Time Delay Adjustment**  
The delay adjustment is located on the same side of the sensor base. Turning the slotted knob fully counterclockwise to set the delay to the minimum (100 ms to activate the output contacts) and delay can be set up to 8 seconds. Use the markings on the label.

### Monitored Circuit Size Information

The AG-LC sensor provides a window with ID of 4.00 inches (102 mm). Measure the OD of one wire. Use this measurement multiplied by 2.15 to obtain the OD of a bundle of three, and by 2.41 for the OD of bundle of four wires. **Please contact the factory for more information.**

As an example, 500 MCM THHN has an OD of 1.00 inches. A bundle of three will have a minimum OD of 2.15 inches, and a bundle of four wires will have a minimum OD of 2.41 inches.