Specifications

Power Supply	120 VAC (66-132 volts, 50-60 Hz) 2.5 VA consumption 24 VAC or VDC (19-29 volts) 2.5 VA consumption Green LED = Power supply energized
Setpoint Range	AG1 Series: 5-100 mA field adjustable AG2 Series: 80-950 mA field adjustable AG3 Series: Tri-Set, 5, 10 & 30 mA, jumper select
Isolation Voltage	Up to 1500 VAC
Frequency Range	50-60 Hz (monitored circuit)
Output Rating	Latching electromechanical relay 1.0 A @ 120 VAC, 2 A @ 30 VDC maximum NOR latches closed upon sensed fault current NCR latches open upon sensed fault current Status (Red) LED = Relay has operated
Response Time	150 ms @ 5% over setpoint 100 ms @ 50% over setpoint 50 ms @ 500% over setpoint
Dimensions	2.98"H x 3.86"W x 1.45"D (76 x 98 x 37 mm) Case aperture 0.75" (19 mm) diameter
Case	UL94 V-0 Flammability rated
Environmental	-4 to 122°F (-20 to 50°C) 0-95% RH, Non-condensing Pollution Degree 2 Altitude to 6561 ft (2000 meters)
Listings	UR/cUR, CE

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

The sensor may comply with EN 61010-1 CAT III 600 V 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. A fuse rated 5 A max shall be placed in series with the main input power terminal. Use twisted pair for output connection.

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 senor 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.

System Grounding

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

Model Number Key

AG 1 - NCR1 - 120 - LA - 005 - N

NOISE IMMUNITY:
N - Noise Immunity
None (Blank)

SETPOINT:
005 to 950 - Factory Adjusted Setpoint in mA (specify when ordering)
TR3 - Tri-Set, 5, 10 & 30 mA, Jumper Select

OPTIONS:
LA - Latching

POWER SUPPLY:
24U - 24 VAC/VDC
120 - 120 VAC

OUTPUT TYPE:
NOR1 - Normally Open (Form A)
NCR1 - Normally Closed (Form B)

SETPOINT RANGE:
1 - 5-100 mA, Adjustable
2 - 80-950 mA, Adjustable
3 - Tri-Set, 5, 10 & 30 mA, Jumper Select

AG Series Ground Fault Detector

Power Supply Notes

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

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NK Technologies

INSTRUCTIONS

AG1, 2 & 3 SERIES

Ground Fault Detectors with Latching Relay Outputs

Quick "How To" Guide

1. **Run all current carrying conductors through detector window.**
   A. Use an auxiliary CT if conductors do not fit. Consult Factory for CT selection.

2. **Mount the detector to a surface if needed.**

3. **Connect output & power wiring.**
   A. Use 30-10 AWG copper conductors rated 75°C minimum. Tighten to 5-7 inch-pounds.
   B. Make sure power and load matches those shown on the sensor's label.

4. **Test.**
   A. Pressing the "TEST" button tests the detectors internal circuits. CAUTION: The output and any connected loads will switch!

490050006 Rev 7

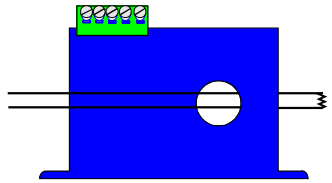
Description

AG Series detectors 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.

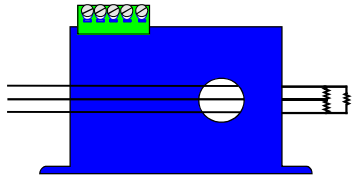
Principal of Operation

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 detector 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.

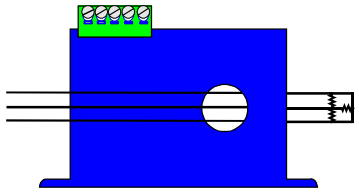
Single Phase (Phase & Neutral or Phase to Phase)

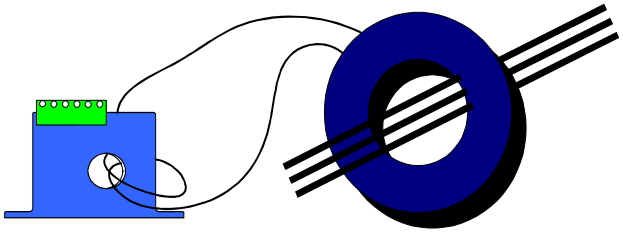


3 Phase Delta (Include neutral if the load uses neutral)



3 Phase Wye (Include neutral if load uses neutral)





3 Phase Load, using an auxiliary Current Transformer. Contact factory for details.

Installation & Wiring

AG Series detectors 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 detector and other magnetic devices. Run all current carrying conductors through the opening in the detector. (See "Principal of Operation") Be Sure all wires are oriented so current flows in the same direction.

Wiring

Use 30-10 AWG copper conductors and tighten terminals to 5-7 inch-pounds torque.

Power

Connect power wiring to Terminals 1 & 2. Be sure that the power supply matches the power rating on the detector label.

Output

Connect output wiring to Terminals 3 & 4.

Reset Switch

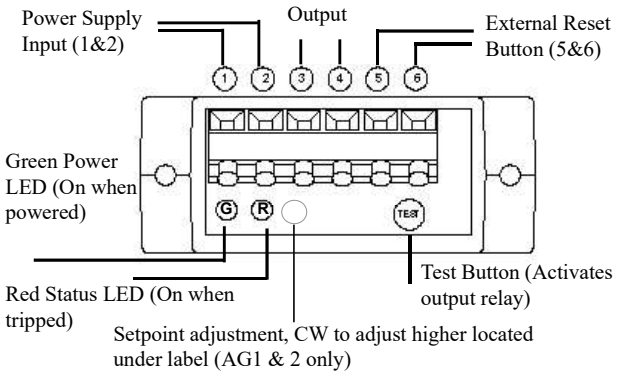
Connect a momentary dry contact to the reset terminals 5 & 6. Limit wire run to 200' of 18 AWG or larger wire.

Momentary Reset

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

Parallel Reset Connection

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



Operation

AG Series Latching Ground fault detectors operate in one of two states: Reset or Latched. If control power is removed, the detector remains in it's last state (latched or reset).

Reset

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

For -NOR1 suffix, the contact is normally open in the reset condition.

For -NCR1 suffix, the contact is normally closed in the reset condition.

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. Also, cycling power to the sensor will reset the output.

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 detector with a momentary dry contact on Terminals 5 & 6. **CAUTION: Any circuit connected to the detector will be operated.**

Field Setpoint Adjustment

While not as precise as having it set at the factory, the set point can be adjusted in the field through use of the small potentiometer located beneath the label to the right of the red LED (status). Though not recommended, if a field adjustment of setpoint is desired, the recommended steps are as follows:

1. Develop a load of the magnitude at which you want the detector to trip; e.g., a 4000 ohm resistor at 120 VAC should provide a load of 30 mA while 4 watt "night light" bulb would create a load of approximately 33.33 mA.

2. With the load energized and passing through the sensing aperture, turn the potentiometer counterclockwise (CCW) until the detector trips. Then turn the pot back (CW) one eighth of a turn.

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