Specifications

Power Supply	120 VAC (66-132 VAC) 50/60 Hz 24 VAC/VDC (19-29 V)
Setpoint Range	See model number key
Power Consumption	2.5 VA
Monitored Circuit	300 VAC max, 50/60Hz
Output Rating	Single Pole, Double Throw (SPDT) relay 1.0 A @ 120 VAC, 2A @ 30 VDC resistive
Response Time	150 ms @ 5% over setpoint 100 ms @ 50% over setpoint 50 ms @ 500% over setpoint
Power (Green) LED	Power supply energized
Status (Red) LED	Relay has operated
Case Dimensions	4.25"H x 3.0"W x 3.25"D (108 x 76 x 89 mm)
Sensing Aperture	Aperture 1.76" (44.7 mm) inside diameter
Case	UL94 V-0 Flammability rated
Terminal Torque	5.3 inch-pounds
Environmental	-4 to 122°F (-20 to 50°C) 0-95% RH, Non-condensing Pollution Degree 2 Altitude to 6561 ft (2000 meters)
Listings	UL/cUL, CE

For products intended for the EU market, the following is applicable to the CE compliance of the product:
The AGL1, 2 and 3 series comply with EN 61010-1 CAT III 300V max. line-to-neutral measurement category. Use twisted pair for output connection. De-energize power before changing set point jumper 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

Warning! Risk of electric shock or personal injury

Safe operation can only be guaranteed if the sensor is used for the purpose for which it was designed and within the 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 hazardous voltage

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

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Model Number Key

AGL1 - SDT1 - 120 - DEN - 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 (default to 5 mA when jumper removed)

Options:
DEN - Normally De-energized
ENE - Normally Energized

Power Supply:
24U - 24 VAC/VDC
120 - 120 VAC

Output Type:
SDT1 - SPDT (Form C Relay)

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

AGL Series Ground Fault Relay

Description

AGL 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.

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 AGL 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 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.

NK Technologies

INSTRUCTIONS

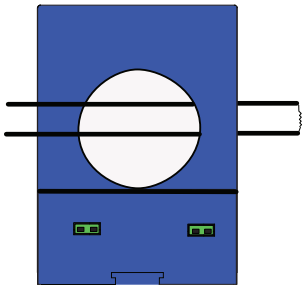
AGL1, 2 & 3 SERIES

Ground Fault Relays with Auto-Reset Relay Outputs

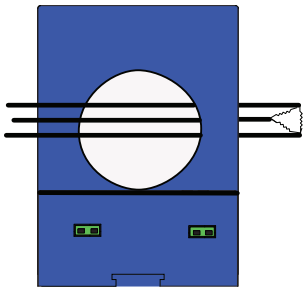
Quick "How To" Guide

1. Run all current carrying conductors through relay 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 22-14 AWG 60°C minimum copper wires.
   B. Make sure power and load matches those shown on the sensor's label.
4. Test.
   A. Pressing the "TEST" button tests the relay's internal circuits. CAUTION: The output and any connected loads will switch!

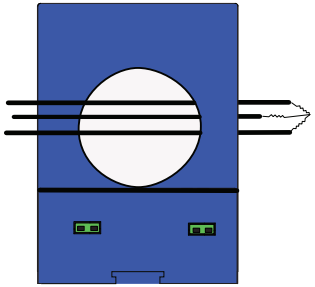
490680003 Rev 11



Single Phase (Phase & Neutral or Phase to Phase)

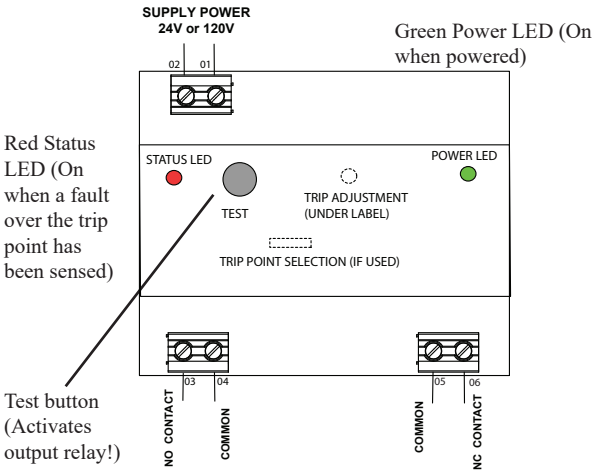


3 Phase Delta (Include neutral if the load uses neutral)



3 Phase Wye (Include neutral if load uses neutral)

Power Supply Input (1 &2)



Output Connection:

DEN output action

(3 & 4), NO closes on fault, (5 & 6) NC opens on fault.

ENE output action

(3 & 4), NO closes with power to the sensor, opens on fault or loss of power to the sensor.

(5 & 6), NC opens with power to the sensor, closes on fault or loss of power to the sensor.

Installation & Wiring

AGL 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 in the same direction.

AGL sensors are designed to mount securely to a standard DIN rail, but the securing spring clip can also be used with a sheet metal screw to hold the sensor in place. NK Technologies can also provide our DINKIT, including a 175mm long piece of rail and two end stops for added convenience when installing.

Wiring

Use 22-14 AWG 60°C minimum copper wire and tighten terminals to 5.3 inch-pounds torque. See Diagram.

Power

Connect power wiring to Terminals 1 & 2. Be sure that the power supply matches the power rating on the relay label. Green LED (Power) will light.

Output

Connect output wiring to Terminals 3 & 4 or 5 & 6.

Test Button

Pressing the TEST button will simulate a fault, and trip the output relay.

Operation

AGL Series Auto-Reset Ground fault relays operate in one of two states: Normal or Tripped. The DEN versions trips the output only with fault current over the set point. The ENE versions trip (change state) when the power is applied to the relay and reverts back to shelf state f power is removed or a fault is sensed. 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, and the normally closed contact opens on fault.

AGL3 ONLY, field selectable models use a jumper to select the trip point. With the jumper removed, 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.

Output Type	No Power at Sensor		Power Applied		Fault Sensed (or Loss of Power- ENE models)	
	3-4	5-6	3-4	5-6	3-4	5-6
DEN	Open	Closed	Open	Closed	Closed	Open
ENE	Open	Closed	Closed	Open	Open	Closed

Field Setpoint Adjustment

AGL1 and AGL2 ONLY, 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 test button. 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 relay 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 33.3 mA.

2. With the load energized and passing through the sensing aperture, turn the potentiometer counterclockwise (CCW) until the relay trips. Then turn the pot back (CW) one eighth of a turn. Use extreme caution as there is power at the sensor terminals!

When used with an external CT, the relay 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.