Specifications

Power Supply	120 VAC +/- 10 %, 50/60 Hz 24 VAC/VDC +/- 10%
Setpoint Range	30-100 mA (See model number key)
Power Consumption	2.3 VA
Monitored Circuit	600 VAC max, 50/60 Hz
Isolation Voltage	2200 VAC
Output Rating	Single Pole, Double Throw (SPDT) relay 2 A @ 120 VAC, 2 A @ 30 VDC general use
Remote Test Terminals	Use dry contact external TEST button (rated ≥ 5 V, 50 mA), < 100 Ω loop resistance
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	Fault detected; Tripped
Case Dimensions	3.54"H x 3.22"W x 2.96"D (89.9 x 81.8 x 75.2 mm)
Sensing Aperture	Aperture 1.25" (31.8 mm) inside diameter
Case	UL94 V-0 Flammability rated
Terminal Torque	6 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 AG1- FM series complies with EN 61010-1 CAT III 300 V max. line-to-neutral measurement category. Use twisted pair for output connection.

24 Volt AC or DC Power Supply	120 VAC 50/60 Hz 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 relay 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 relay, certain parts may carry hazardous live voltage (e. g. primary conductors, power supply). The relay should not be put into service if the installation is not complete.

Model Number Key

AG 1 - SDTR - 120 - DEN - XXX - FM

Case Style:
FM - Solid-Core

Setpoint:
030 to 100 - Factory Adjusted Setpoint in mA (specify when ordering)

Options:
DEN - Auto-Reset, Normally De-energized
ENE - Auto-Reset, Normally Energized

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

Output Type:
SDT - SPDT (Form C Relay)
SDTR - SPDT (Form C Relay) with remote TEST terminals

Setpoint Range:
1 - Factory Adjustable (30-100 mA)

AG1-FM Series Ground Fault Relay

Description

AG1-FM 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.

Know Your Power



Other NK Technologies Products Include:
AC & DC Current Transducers and Switches
1ϕ & 3ϕ Voltage and Power Transducers
Current Transformers (CTs)
Ground Fault Protection Relays

NK Technologies

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INSTRUCTIONS



AG1-FM SERIES

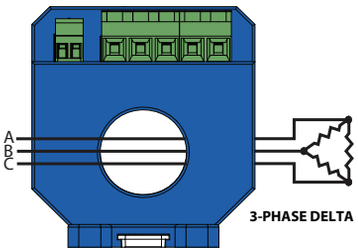
Ground Fault Relays with Auto-Reset Relay Outputs

Quick "How To" Guide

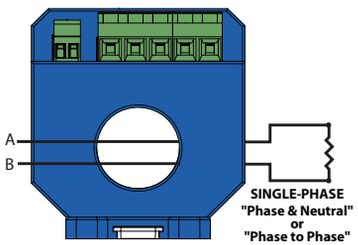
1. Run all current carrying conductors through relay aperture.
2. Mount the detector to a surface if needed.
3. Connect output & power wiring.
   A. Make sure power and load matches those shown on the sensor's label. An external 5 A max fuse is recommended.
   B. Connect remote TEST button if used (not included).
4. Test.
   A. Pressing the TEST button tests the relay's internal circuits. CAUTION: The output and any connected loads will switch!

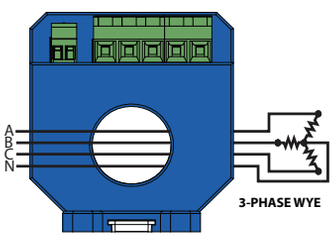
490060404 Rev 1

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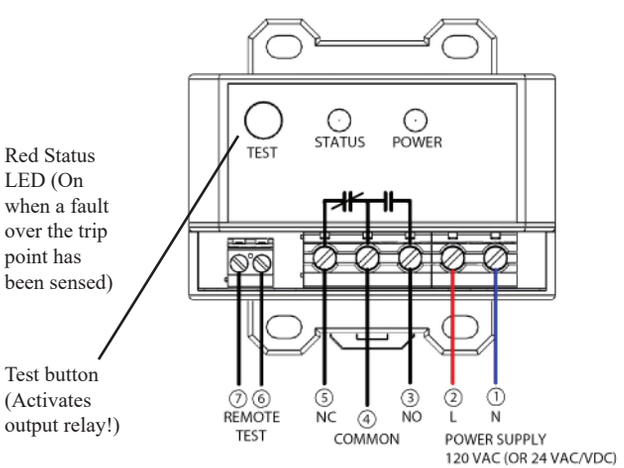


Note: For 4-wire delta source (i.e. high-leg delta, wild-leg or stinger leg delta) include the neutral if the delta load has a neutral connection.





Note: Omit neutral if the load has no neutral connection.



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 AG1-FM 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 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 AG1-FM unit power isolated from noisy circuits.

Installation & Wiring

AG1-FM 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. AG1-FM relays can be placed immediately next to each other. Run all current carrying conductors through the aperture in the relay. (See "Principal of Operation") Be sure all wires are oriented so current flows in the same direction.

AG1-FM relays are designed to mount securely to a standard DIN rail or by using 4 sheet metal screws to hold the sensor in place. NK Technologies can also provide our DINKIT, including a 175 mm long piece of rail and two end stops for added convenience when installing.

Wiring

Use 22-12 AWG 75°C minimum copper wire and tighten terminals to 6 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. An external 5 A max fuse is recommended.

Output

Connect output wiring to terminals 3 & 4 (NO) or 4 & 5 (NC).

Remote TEST Button (optional not included)

Connect external TEST button to terminals 6 & 7. Twisted pair wiring is recommended.

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

Operation

AG1-FM 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 if 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.

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

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