PGFM SERIES (ELCI, MARINE)

ELCI MARINE GROUND FAULT PROTECTION SENSING MODULE

Introduction

The LineGard™ PGFM product family provides ELCI (equipment leakage) ground fault sensing and is designed and manufactured by North Shore Safety, a leader in innovative safety products. The PGFM series operates in tandem with an Airpax™ LEL series, UL 489 listed circuit breaker, with shunt trip and auxiliary switch manufactured by Sensata Technologies. The PGFM can be paired with an Airpax™ IDLNK breaker for applications requiring ignition protection.

The combined assembly of the PGFM and an Airpax™ breaker meets the requirements of ABYC E-11 for ground fault protection and main shore power circuit protection. The PGFM constantly monitors the current balance of the conductors (wires / cables) supplying power to the load. When a ground fault of 27mA nominal (30 mA max) occurs, the PGFM uses the LEL's shunt trip coil to signal the breaker to trip.

Features

- Power and fault status indicators
- Provides identification of a ground fault vs. short circuit trip
- Chemical and UV resistant enclosure
- Trip level of sensing device < 30mA (27mA nominal) at trip time of < 100mS (60mS nominal) per E-11
- Protection range and operating voltage: 0 - 50 Amps, 120 VAC, 120/240 VAC
- Unit operating temperature is -35°C to +66°C
- Accommodates up to 3 wires, 6 AWG, with no twisting of the wires required

SPECIFICATIONS

Type	E-11 GFP - UL 943 Category FTTJ2 when used in tandem with Airpax LEL series (UL 489 listed circuit breaker with shunt trip)
Operating Voltage	120 VAC or 120/240 VAC, 50/60 Hz
Interrupting Voltage	Rating of UL 489 listed circuit breaker
Sensing Coil Voltage Limit	600 VAC maximum
Phase Interrupt	Single (120 VAC 3 wire), Split (120/240 VAC 4 wire) , 240VAC 3-wire (L1, L2, N)
Interrupting Current	120VAC, 50A, 5kAIC 120/240VAC, 50A, 5kAIC
Trip Time of Combined Assembly	100mS or less (60mS nominal)
Trip Level	27mA +/- 2mA
Operating Temperature	-35°C to +66°C
Reset Type	Automatic on power up
ABYC E-11 Acceptability	The LineGard™ PGFM ELCI module used in tandem with the Airpax™ circuit breaker meets the requirements of the ABYC (American Boat and Yacht Council) E-11 standard covering AC and DC systems on boats

Note:
1. Manual configuration should be specified if automatic start-up after power restoration of circuit power creates an unsafe condition.
2. As per UL 943 requirements, portable devices may require breaking of neutral during ground fault detection. Please contact the factory.
3. Please contact Airpax for optional ELCI, UL 1053 compliant devices.

AIRPAX™ LEL & IDLNK SERIES CIRCUIT BREAKER RATINGS (PER UL489)

Voltage	Current	Frequency	Short Circuit	Poles
125VAC	0.05 to 50 amps	50/60 Hz	5,000 amps	1 to 3
120/240VAC	.05 to 50 amps	50/60 Hz	5,000 amps	2 to 3

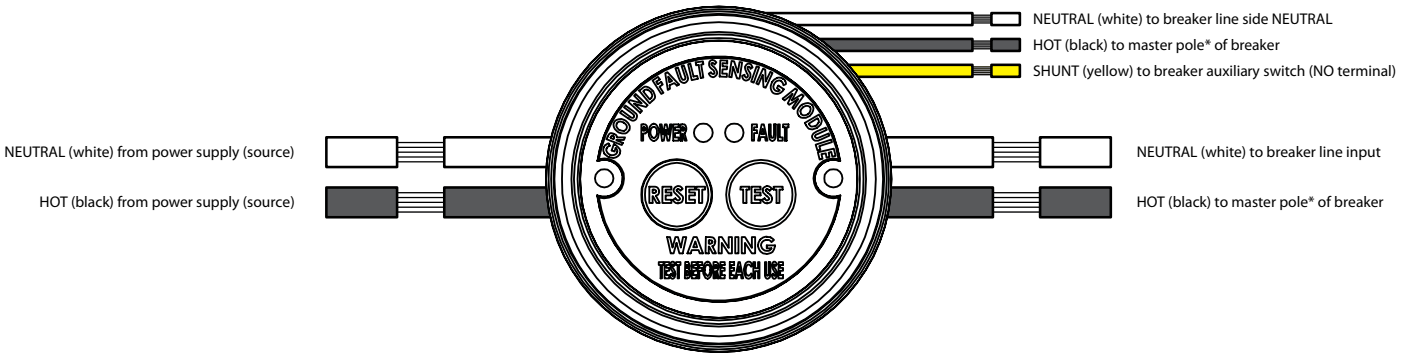
AIRPAX™ LEL & IDLNK SERIES CIRCUIT BREAKER SPECIFICATIONS

Moisture Resistance	MIL-STD-202, Method 106
Salt Spray (Corrosion)	MIL-STD-202, Method 101
Shock	MIL-STD-202, Method 213, Test Condition I with 100% rated current applied
Vibration	MIL-STD-202, Method 204, Test Condition A with 100% rated current applied
LEL Agency Approvals	UL489 Listed, CSA Certified, VDE Approved, CCC Approved, CE Compliant
IDLNK Agency Approvals	UL 1077 Recognized, C22.2 No. 235 complaint to UL 1500 or SAE J1171 ignition protection

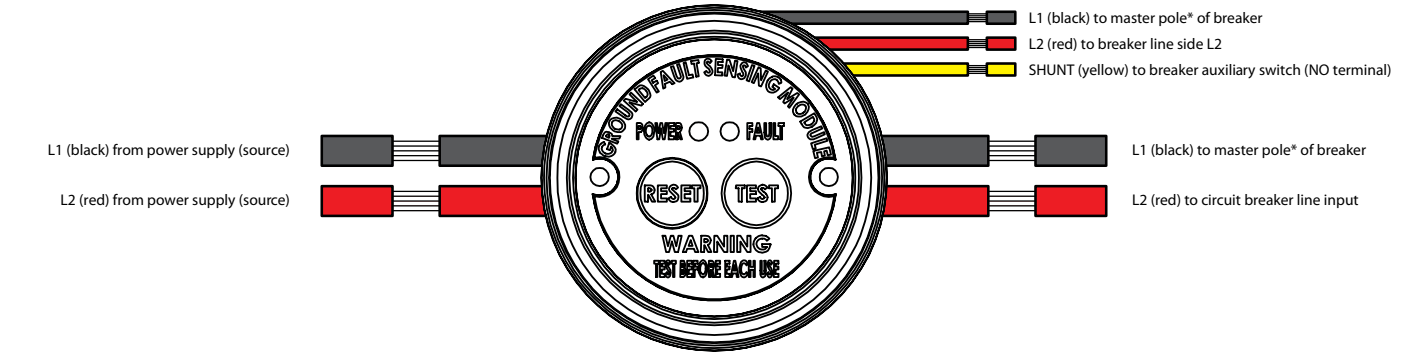
Salt Fog (Corrosion)	ASTM B117
Shock	33CFR183.534 - modified to supply 5,000 shocks @ 25G, instead of test standard of 1,000 shock
Vibration	MIL-STD-810 (random vibe 4G RMS), IEC 6945 (sine sweep 5 to 100 Hz for low frequency)
Ignition Protection	SAE J1171 (UL1500)

WIRING DIAGRAM

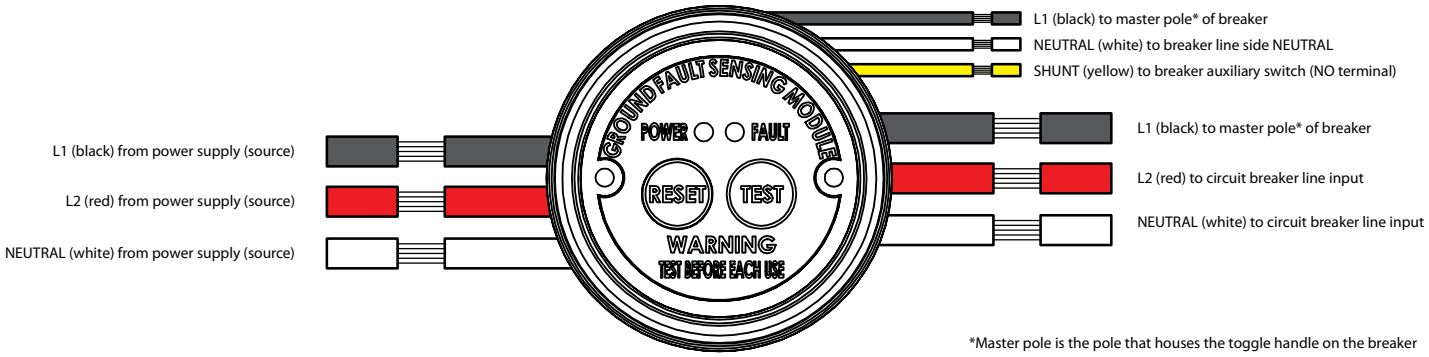
Wiring Diagram (120VAC APPLICATION)



Wiring Diagram (240 VAC APPLICATION)

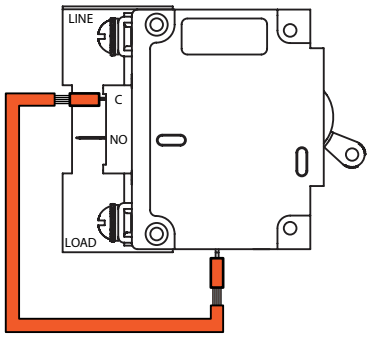


Wiring Diagram (120/240 VAC APPLICATION)



*Master pole is the pole that houses the toggle handle on the breaker

Wiring Diagram (Orange Jumper Wire For Circuit Breaker)



DANGER!

Hazard of electrical shock, burn or explosion.
Disconnect power at main power feed before you start installation. Failure to do so may cause severe shock, personal injury, or death.

Installation Instructions

1. Read and follow all instructions
2. Identify all the features and wires (see drawings)
3. Identify line wires and load wires
4. Verify that the ratings on the device, including the circuit breaker, match your field line ratings
5. Strip wires to 5/8", or as recommended for your connections (module may include field terminations)
6. Choose the right wiring application (120VAC or 120/240VAC split phase) and connect wires according to diagrams
7. Place supplied test instruction label in close proximity to the ground fault sensing module mounting location.

NOTE: The ground wire should be connected externally. The Ground wire does not enter or exit the ground fault sensing module. Although the PGFM does not monitor ground leads or require ground to operate, ground connection is recommended and should be made at junction box.

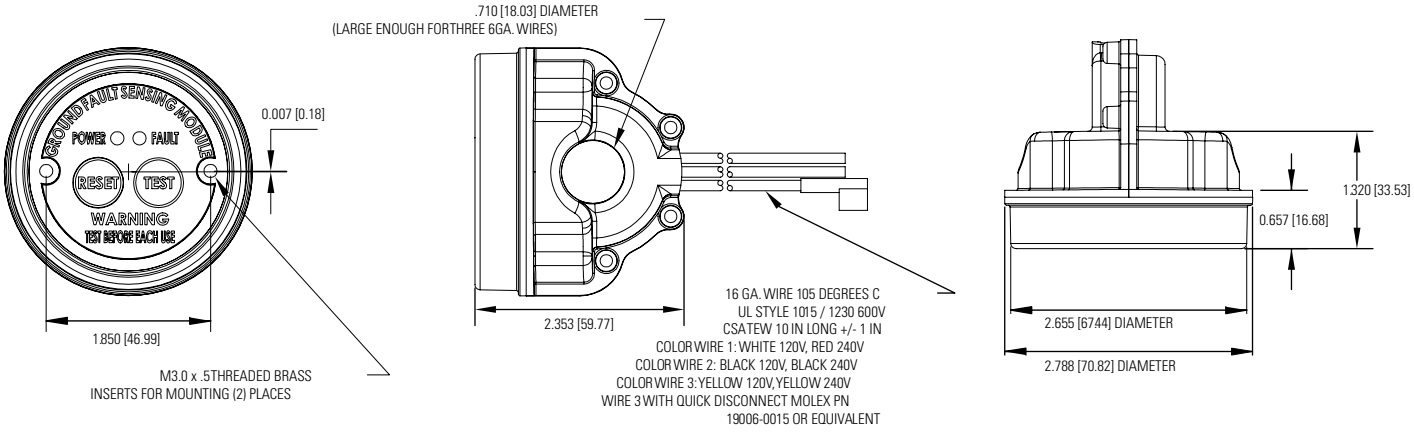
Testing And Troubleshooting

In the normal operating state, the PGFM green LED is "ON" and circuit breaker is in the "ON" position.

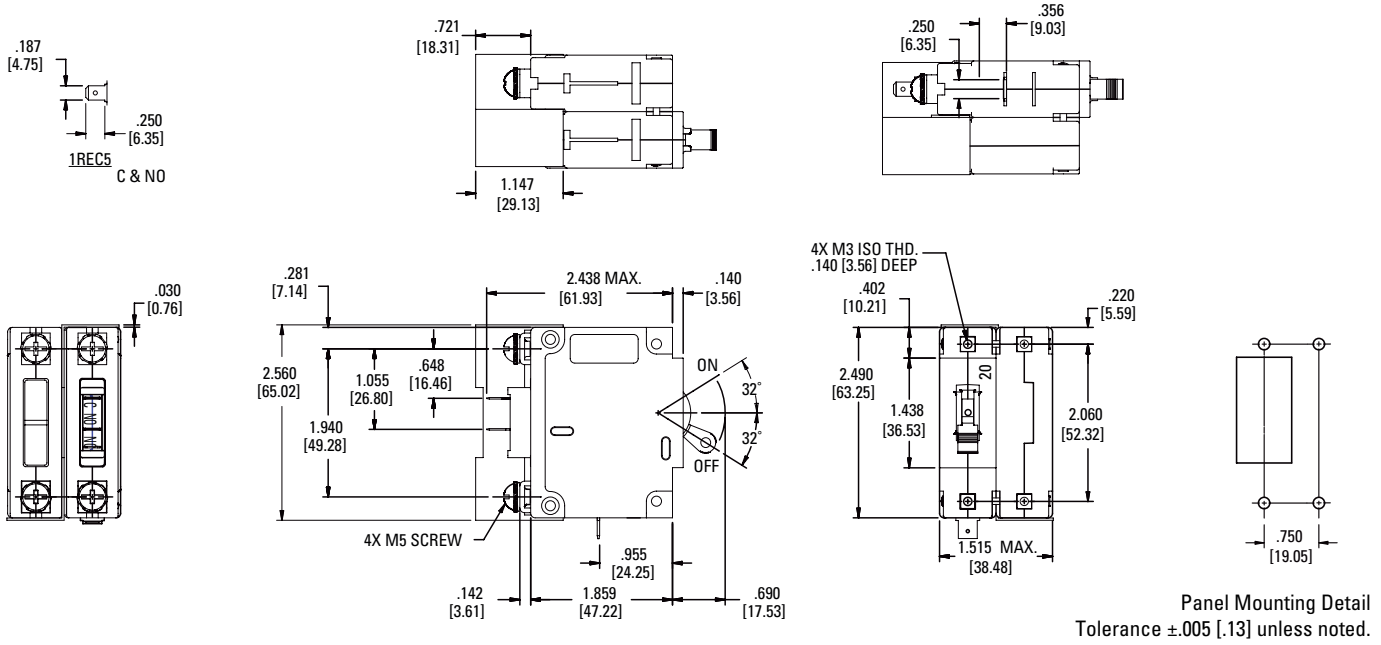
1. Press "TEST" button: Green LED should go "OFF" and red LED should come "ON" and circuit breaker should trigger to "OFF" position
2. If sensing device red LED does not illuminate or breaker does not trip or change state, DO NOT USE and consult an electrician for assistance
3. Press "RESET" button: Red LED should turn "OFF" and green LED should turn "ON"
4. Manually reset (switch) the circuit breaker to the "ON" position to restore circuit power

WARNING: If the test fails, do not use this ELCI. Consult a qualified electrician for repair or replacement

Dimensional Drawings (Pgfm Marine)

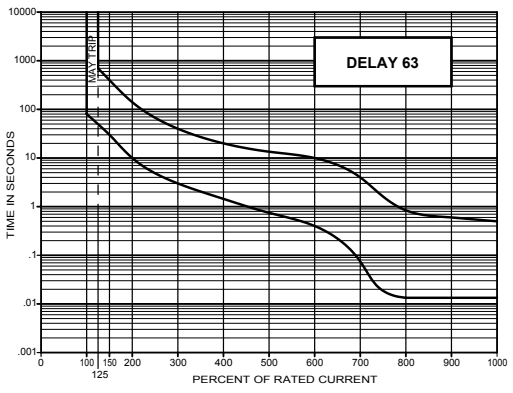


Dimensional Drawings (Example Of Lel, Typical 2-Pole Configuration)

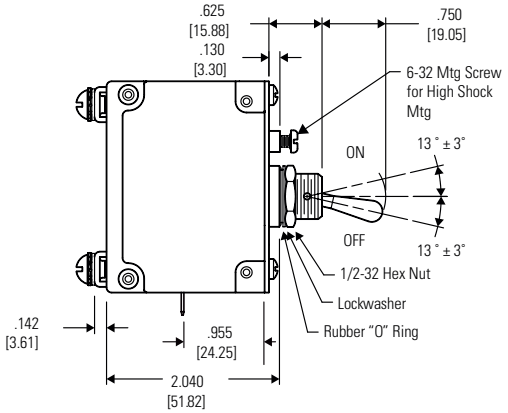


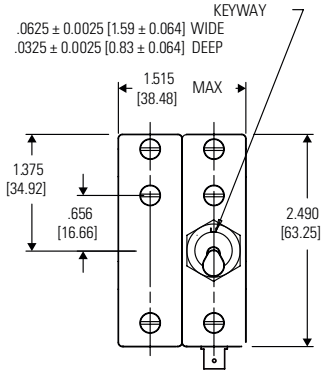
Panel Mounting Detail
Tolerance ±.005 [.13] unless noted.

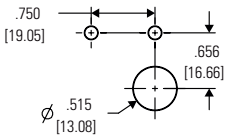
Compatible Airpax™ Circuit Breakers - Ul 489 Listed; Vde Per En 60934 (Non-Ignition Protected)

Amps	Poles	Part Number	Voltage	Trip Coil	Short Circuit	Delay Curve
30	2	LEL12-1REC5-37583-30-G1-V	120V	120V	5000A	
30	2	LEL12-1REC5-37583-30-G2-V	240V	240V	5000A	
30	3	LEL121-1REC5-37275-30-G1-V	120/240V	120V	5000A	
50	2	LELK12-1REC5-37583-50-G1-V	120V	120V	5000A	
50	2	LELK12-1REC5-37583-50-G2-V	240V	240V	5000A	
50	3	LELK121-1REC5-37275-50-G1-V	120/240V	120V	5000A	

Dimensional Drawings (Example Of IdInk, Typical 2-Pole Configuration)

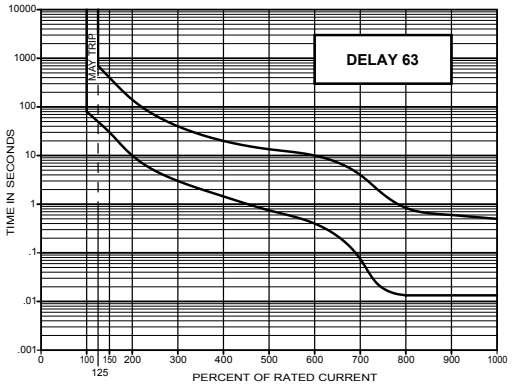






Panel Mounting Detail
Tolerance ±.005 [.13] unless noted.

Compatible Airpax™ Circuit Breakers - Ul 1077 Recognized; Ignition Protected Per Sae J1171 (Ul 1500)

Amps	Poles	Part Number	Voltage	Trip Coil	Short Circuit	Delay Curve
30	2	IDLNK21-1REC5-38140-30-G1	120V	120V	5000A	
30	2	IDLNK21-1REC5-38140-30-G2	240V	240V	5000A	
30	3	IDLNK121-1REC5-39945-30-G1	120/240V	120V	5000A	
50	2	IDLNK21-1REC5-38140-50-G1	120V	120V	5000A	
50	2	IDLNK21-1REC5-38140-50-G2	240V	240V	5000A	
50	3	IDLNK121-1REC5-39945-50-G1	120/240V	120V	5000A	

ORDERING OPTIONS

Example: PGFM-110-B-A1-188

PGFM - 1 1 0 - B - A1 -188

Product Type

PGFM

Operating Voltage

1: 120VAC
2: 240VAC

Conguration

1: Shunt w/ Aux. Switch

Reset Type**

1: Automatic

Assembly Options

B: Matching circuit breaker (see below)

Installation Kit*

A1: Test instruction label Circuit breaker jumper wire Mounting gasket 2 mounting screws (M3)

Physical Shape

-188: Round Conguration

WARNINGS

RISK OF MATERIAL DAMAGE AND HOT ENCLOSURE

- The product's side panels may be hot, allow the product to cool before touching
- Follow proper mounting instructions including torque values
- Do not allow liquids or foreign objects to enter this product

Failure to follow these instructions can result in serious injury, or equipment damage.

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Disconnect all power before installing or working with this equipment
- Verify all connections and replace all covers before turning on power

Failure to follow these instructions can result in death or serious injury.

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