



LineGard | 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 a Airpax™ LEL series, UL 489 listed circuit breaker, with shunt trip and auxiliary switch manufactured by Sensata Technologies.

The **combined assembly** of the PGFM and LEL series 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.



Airpax™ LEL series

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
- Module incorporates high frequency noise filtering
- 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
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
Frequency	50/60 Hz
Operating Temperature	-35°C to +66°C
Reset Type	Automatic on power up

AIRPAX™ LEL 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 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
Approvals	UL489 Listed, CSA Certified, VDE Approved, CCC Approved, CE Compliant

LINEGARD™ PGFM SERIES ELCI SPECIFICATIONS

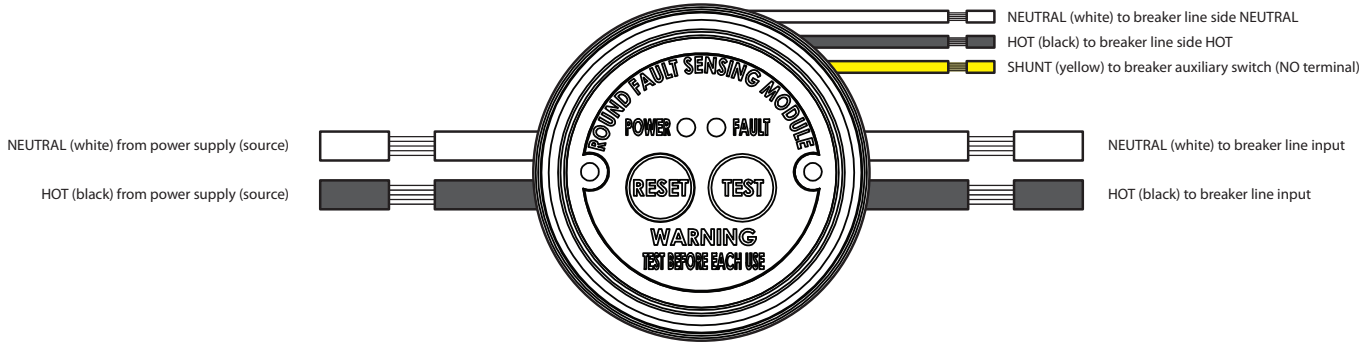
Salt Fog (Corrosion)	ASTM B117
Shock	33CFR183.534 - modified to supply 5,000 shocks @ 25G, instead of test standard of 1,000 shocks
Vibration	MIL-STD-810 (random vibrate 4G RMS), IEC 6945 (sine sweep 5 to 100 Hz for low frequency)
Ignition Protection	SAE J1171

ABYC E-11 ACCEPTABILITY

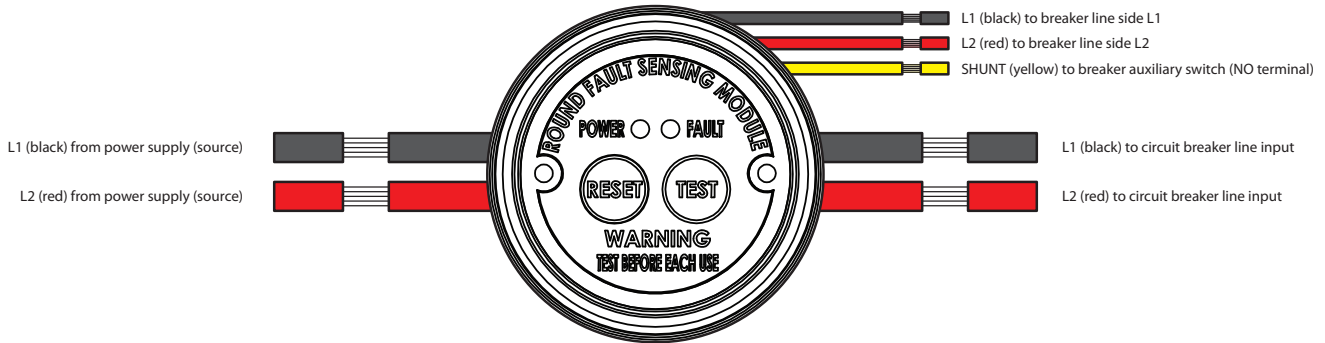
The LineGard™ PGFM ELCI module used in tandem with the Airpax™ LEL type circuit breaker meets the requirements of the ABYC (American Boat and Yacht Council) E-11 standard covering AC and DC systems on boats. This standard states the following:

- 11.11.1 An Equipment Leakage Circuit Interrupter (ELCI) shall be installed with or in addition to the main shore power disconnect circuit breaker(s) or at the additional overcurrent protection as required by E-11.10.2.8.3, whichever is closer to the shore power connection.
- 11.11.1.1 This device shall meet the requirements of UL 1053 Standard for Safety for Ground-Fault Sensing and Relaying Equipment and the requirements of UL 943 Ground Fault Circuit Interrupters with the exception of trip level and trip time. Trip level shall be set at a maximum of 30mA. The trip time shall be set at a maximum of 100ms.

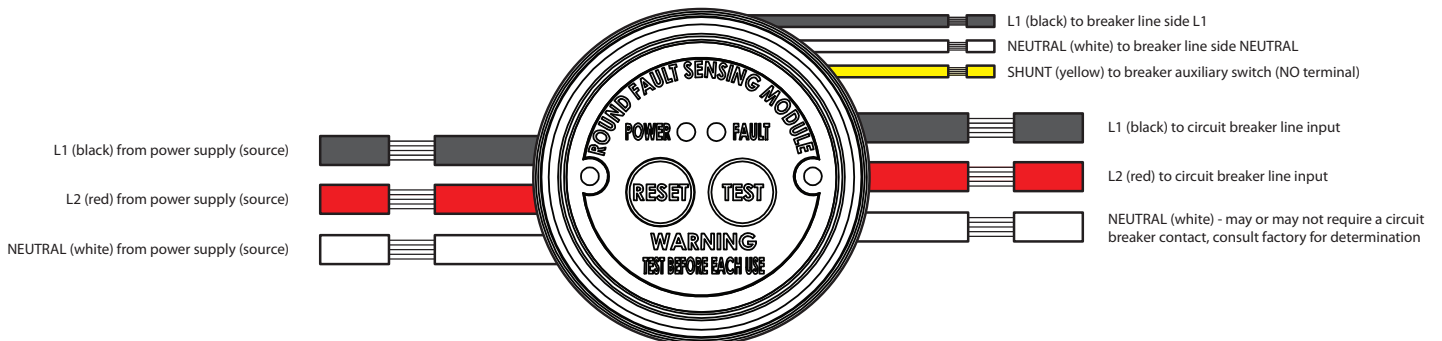
WIRING DIAGRAM (120VAC APPLICATION)



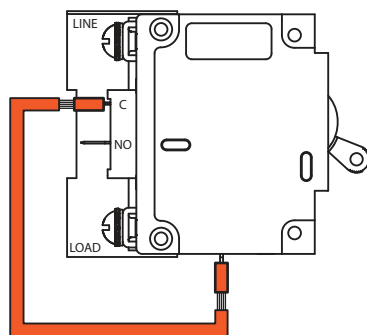
WIRING DIAGRAM (240 VAC APPLICATION)



WIRING DIAGRAM (120/240 VAC APPLICATION)



WIRING DIAGRAM (ORANGE JUMPER WIRE FOR CIRCUIT BREAKER)



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 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 LED 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

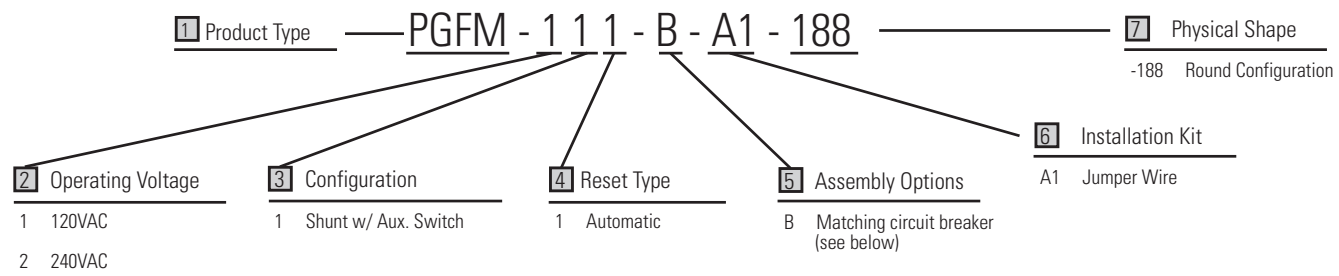
WARNING: If the test fails, do not use this GFCI. Consult a qualified electrician for repair or replacement.



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.

DECISION TABLES (PGFM Series)



COMPATIBLE AIRPAX™ CIRCUIT BREAKER PART NUMBERS

AMPS	2 Pole Break 120/240 VAC	2 Pole Break 120/240 VAC	3 Pole Break 120/240 VAC	Trip Coil
30	LEL12-1REC5-37583-30-G1-V	—	LEL121-1REC5-37275-30-G1-V	120V
30	—	LEL12-1REC5-37583-30-G2-V	—	240V
50	LELK12-1REC5-37583-50-G1-V	—	LELK121-1REC5-37275-50-G1-V	120V
50	—	LELK12-1REC5-37583-50-G2-V	—	240V

* All breakers with the exclusion of the 50 amp breakers come standard with #10-32 screw terminals.
 * 50 amp breakers come standard with #10-32 stud terminals.
 Contact factory for additional constructions and part numbers

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