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PGR-3200 MANUAL
INSULATION MONITOR

REVISION 3-F-032320

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TABLE OF CONTENTS

SECTION **PAGE**

LIST OF FIGURES

FIGURE **PAGE**

DISCLAIMER

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1. GENERAL

The PGR-3200 Insulation Monitor measures phase-to-ground resistance to detect electrical-insulation failure in an ungrounded power utilization system. It provides three levels of detection with a 50-kΩ warning with an LED and output contact indication, a 30-kΩ warning with LED indication, and a 10-kΩ alarm with LED and output contact indication. An analog output is provided for predictive maintenance trending.

The PGR-3200 can be used to detect faults in ungrounded systems up to 6 kV. It can be directly connected to a system up to 1.3 kV, single or three phase, 50 or 60 Hz. A PGH-series high-tension coupler is required for 5- and 6-kV systems.

2. OPERATION

The PGR-3200 actively monitors insulation resistance when it is connected to the supply voltage. All conductors connected to the monitored circuit are included in the insulation measurement (see **Figure 2**).

2.1 Relay Operating Mode

The PGR-3200 output relays operate in the non-fail-safe mode; they energize when an insulation warning or alarm occurs.

2.2 Front-Panel Controls

2.2.1 Reset

The front-panel RESET switch is used to reset latching trips. Cycling the supply voltage will also reset the PGR-3200. See **Section 2.5.**

2.2.2 Test

All LEDs will light and output relays will energize when the TEST button is pressed for at least 8 s.

2.3 Front-Panel Indication

2.3.1 Power

The green LEDs labelled PWR indicates presence of supply voltage.

2.3.2 Insulation Warning

The red LEDs labelled 50 kΩ and 30 kΩ will light when those respective insulation resistance values, or lower are measured.

2.3.3 Active

The red LED labelled ACTIVE indicates the monitor is enabled.

2.3.4 Insulation Alarm

When insulation resistance measures 10 kΩ or less, the red LED labelled <10 kΩ will light.

2.4 Analog Output

A non-isolated, 0- to 1-mA output (terminals 25 and 26) indicates insulation resistance. The metering output relates to an insulation-resistance range of 0 to infinity using optional meter PGA-0510 (see **Figures 2, 3** and **6**).

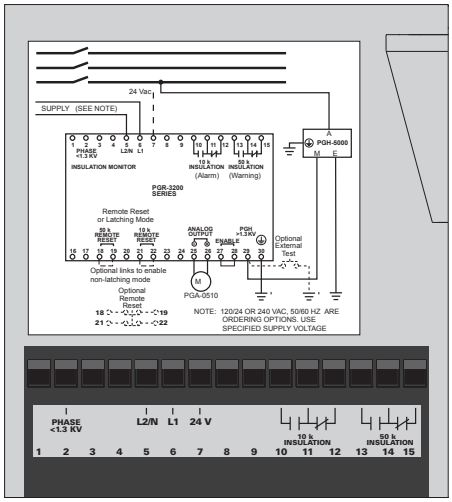
2.5 Remote Reset

When remote-reset terminals 18 and 19 (alarm) or 21 and 22 (warning) are not connected, a warning or alarm remains latched until the RESET switch is pressed or the remote-reset terminals are momentarily opened.

If the remote-reset terminals are connected, the PGR-3200 operates in non-latching mode; a warning or alarm will reset when the fault is removed.

2.6 Remote Test

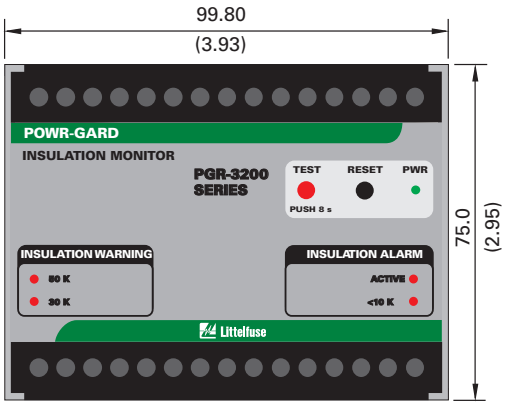
When terminal 29 is connected to ground the monitor will alarm (see **Figures 2** and **3**). Response to a test input can take several seconds.



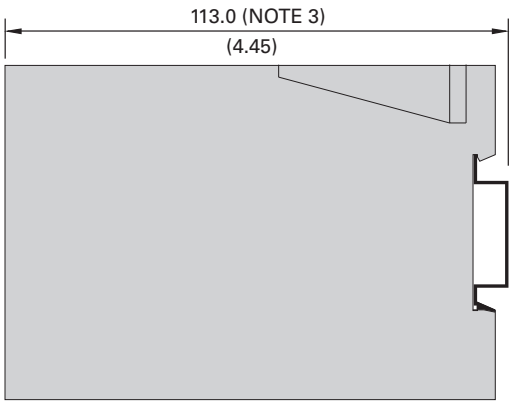
TOP

NOTES:

1. DIMENSIONS IN MILLIMETRES (INCHES).
2. MOUNTING SCREWS: M4 x 13 OR 8-32 x 0.50.
3. OVERALL DIMENSION WHEN MOUNTED ON DIN EN50022 35 mm x 7.5 mm TOP-HAT RAIL.
4. 24 V INPUT IS AVAILABLE ONLY FOR THE PGR-3200-120 ORDERING OPTION.



FRONT



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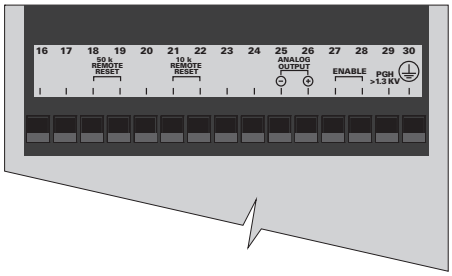
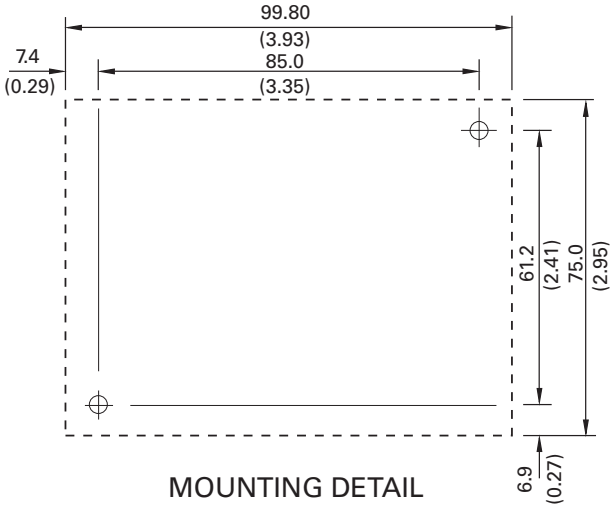


BOTTOM



MOUNTING DETAIL

Figure 1. PGR-3200 Outline and Mounting Details.

3. INSTALLATION

NOTE: Mounting, terminal-block connections, and wiring must conform to applicable local electrical codes. Check all applicable codes prior to installation.

The PGR-3200 can be surface or DIN-rail mounted (see **Figure 1**).

Use terminal 6 (L1) as the line terminal and terminal 5 (L2/N) as the neutral terminal. Connect terminal 30 to ground.

For systems up to 1.3 kV, connect terminal 2 to one phase on the load side of the starter.

Connect terminals for latching operation, remote reset, and remote test as required (see **Sections 2.5** and **2.6** and **Figures 2** and **3**).

Connect an optional PGA-0510 Analog Ohm Meter to terminals 25 and 26. Meter outline, dimensions, and cutout size are shown in **Figure 6**.

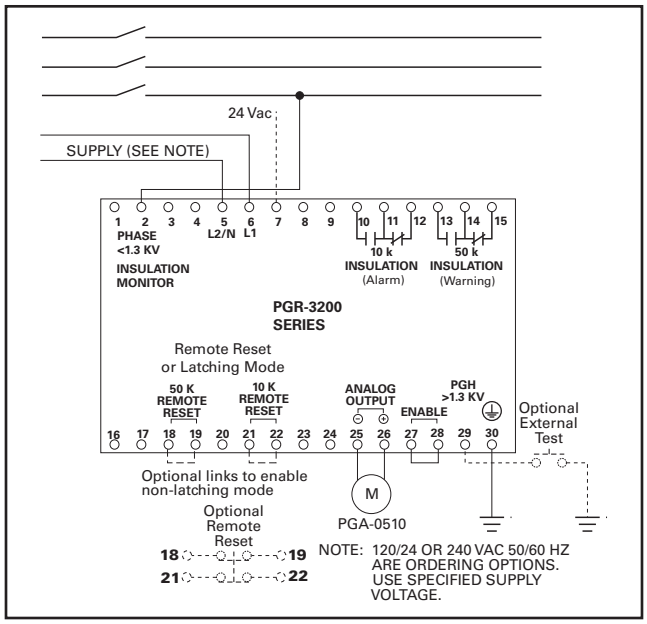


Figure 2. Connection Diagram for Ungrounded Systems Under 1.3 kV.

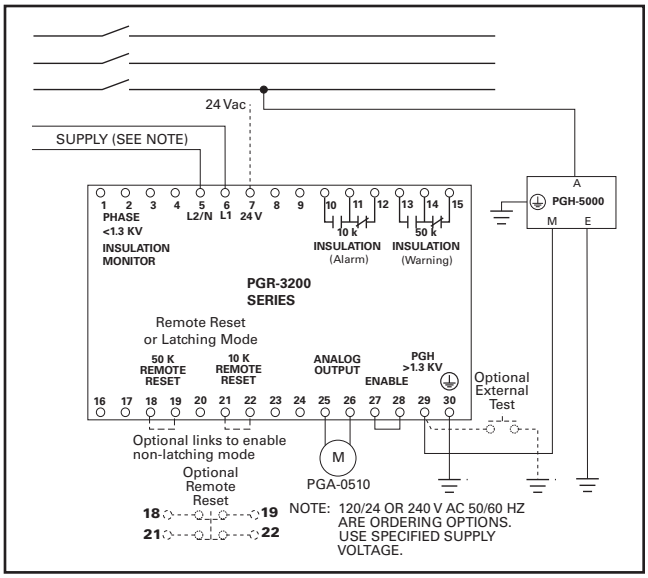
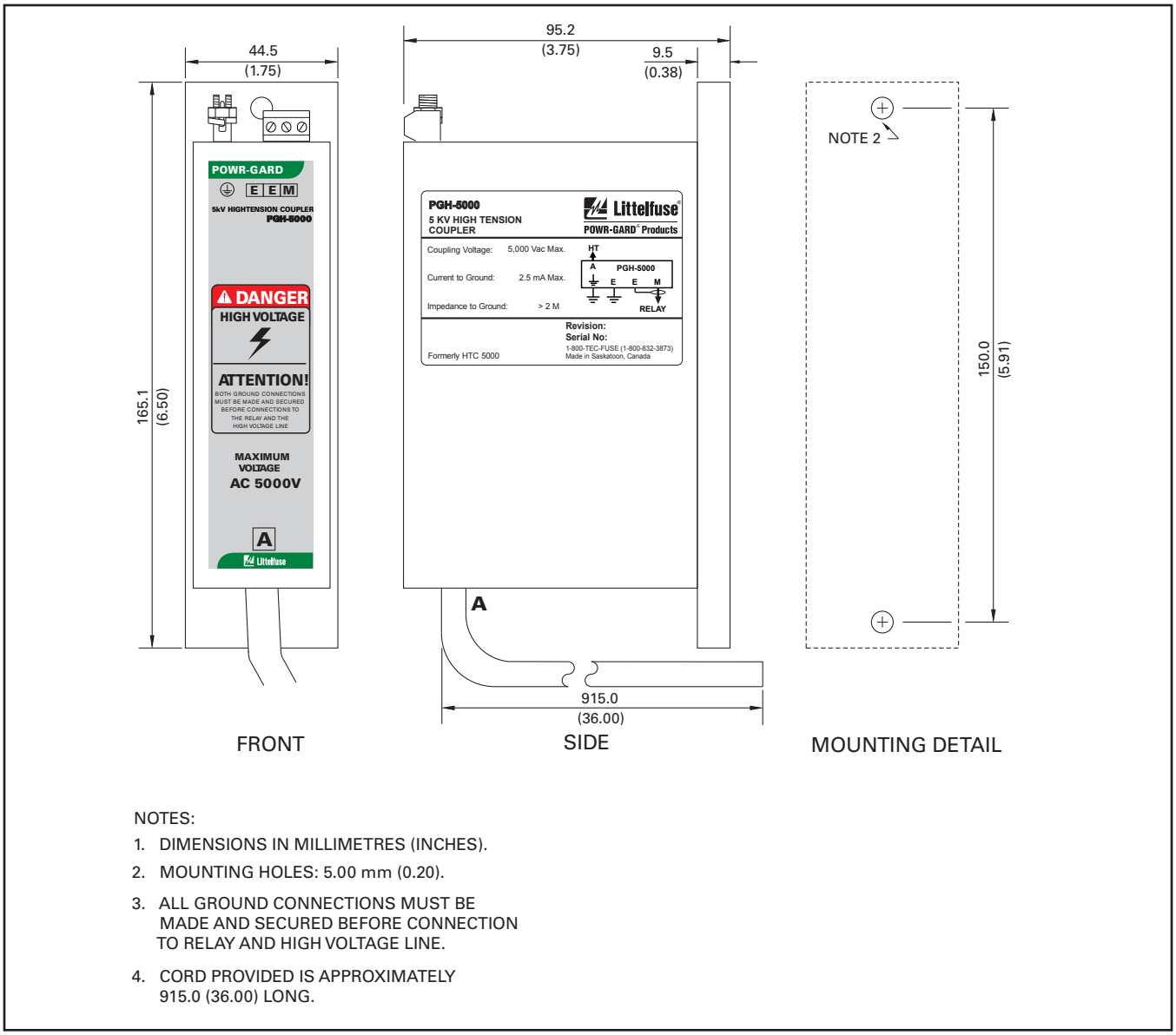


Figure 3. Connection Diagram for Ungrounded 5-kV Systems.



NOTES:

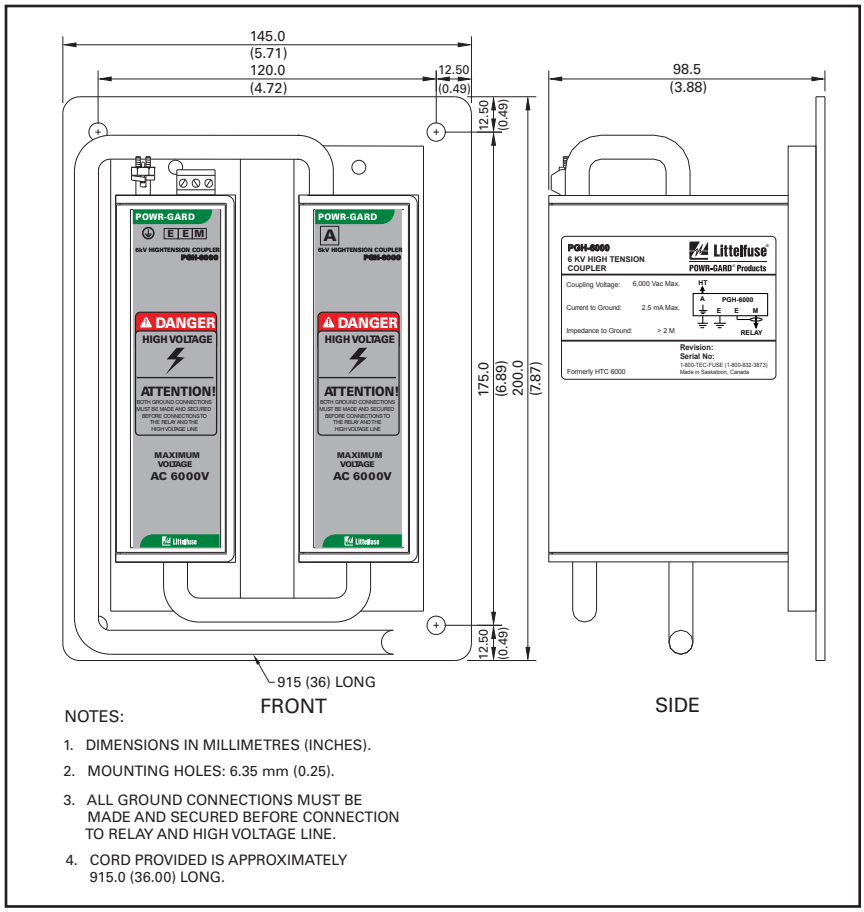
1. DIMENSIONS IN MILLIMETRES (INCHES).
2. MOUNTING HOLES: 5.00 mm (0.20).
3. ALL GROUND CONNECTIONS MUST BE MADE AND SECURED BEFORE CONNECTION TO RELAY AND HIGH VOLTAGE LINE.
4. CORD PROVIDED IS APPROXIMATELY 915.0 (36.00) LONG.

Figure 4. PGH-5000 Outline and Mounting Details.

3.1 PGH-5000 and PGH-6000

For 5-kV and 6-kV systems, connect the PGR-3200 to the monitored circuit with a PGH-5000 and PGH-6000 respectively. See **Figure 4** for PGH-5000 outline and mounting details. See **Figure 5** for PGH-6000 outline and mounting details.

Connect protective-ground terminal (⏚) to ground. Connect terminal E to ground or to PGR-3200 terminal 30, which must be grounded. Connect terminal M to PGR-3200 terminal 29. PGR-3200 terminal 2 is not used. For PGR-3200 to PGH-5000/PGH-6000 distances greater than 10 m (30 ft), use shielded cable, and connect the cable shield to the second PGH-5000/PGH-6000 terminal E. Connect terminal A to one phase on the load side of the motor starter (see **Figure 3**). The PGH-5000/PHG-6000 includes 915 mm (36 in.) of high-voltage conductor.



NOTES:

1. DIMENSIONS IN MILLIMETRES (INCHES).
2. MOUNTING HOLES: 6.35 mm (0.25).
3. ALL GROUND CONNECTIONS MUST BE MADE AND SECURED BEFORE CONNECTION TO RELAY AND HIGH VOLTAGE LINE.
4. CORD PROVIDED IS APPROXIMATELY 915.0 (36.00) LONG.

Figure 5. PGH-6000 Outline and Mounting Details.

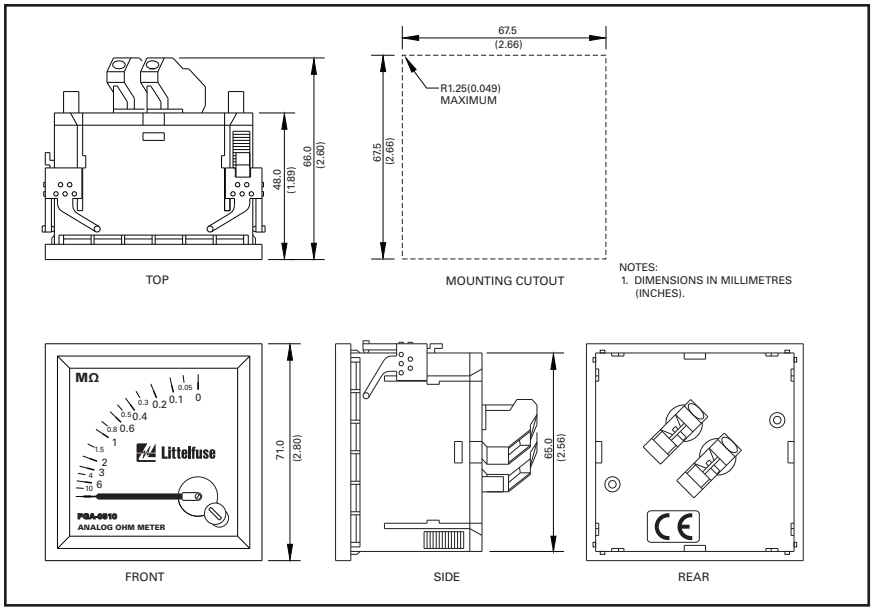


Figure 6. PGA-0510 Analog Ohm Meter.

4. TECHNICAL SPECIFICATIONS

4.1 PGR-3200

Supply
- 120 V option ..... 5 VA, 120 V ac, 24 V ac (+10, -15%) 50/60 Hz
- 240 V option ..... 5 VA, 240 V ac, (+10, -15%) 50/60 Hz

Maximum System Voltage:
- Direct Connection:
  - UL Rating ..... 600 V ac
  - Maximum ..... 1,300 V ac
- With PGH-5000 ..... 5,000 V ac
- With PGH-6000 ..... 6,000 V ac

Measuring Voltage ..... 12 V dc
Measuring Current ..... 20 µA maximum
DC Resistance ..... 600 kΩ
AC impedance at 50-60 Hz ..... > 1 MΩ
Frequency Range ..... 50 – 20,000 Hz

Response-Level Settings ..... 10, 30, and 50 kΩ (fixed)

Response Delay:
- Warning, 10 kΩ relay output:
  - Insulation Resistance < 5 kΩ ..... 4 s
  - Insulation Resistance = 10 kΩ ..... 5 s
- Alarm, 50 kΩ relay output:
  - Insulation Resistance < 25 kΩ ..... 2.5 s
  - Insulation Resistance = 50 kΩ ..... 4.5 s

Analog Output:
- Mode ..... Self Powered
- Range ..... 0 to 1 mA
- Impedance ..... 6 kΩ maximum
- Parameter ..... 0 to ∞ Ω Insulation Resistance

Output Relays; Warning and Alarm:
- Configuration ..... N.O. and N.C. (Form C)
- Operating Mode ..... Non-Fail-Safe
- UL Contact Rating ..... 5 A, 240 V ac resistive, 0.28 A, 30 V dc resistive
- Switching Capacity ..... 1,200 VA
- Supplemental Contact Ratings:
  - Carry Continuous ..... 5 A, maximum

Trip Mode ..... Latching or Non-Latching

Reset ..... Front-Panel Button and Remote N.C. Contacts

Test ..... Front-Panel Button and Remote N.O. Contact

Terminals ..... Wire Clamping, 22 to 12 AWG (0.3 to 3.3 mm^2) conductors
- Tightening Torque ..... 0.40 N·m (3.54 lbf·in)
- Conductor Type ..... Copper, Solid or Stranded with Ferrules
- Conductor Rating ..... 60/75 °C

Dimensions:
- Height ..... 75 mm (3.0 in.)
- Width ..... 100 mm (3.9 in.)
- Depth ..... 113 mm (4.4 in.)
  - Including DIN rail ..... 115 mm (4.5 in.)

Shipping Weight ..... 0.45 kg (1 lb)

Environment:
- Operating Temperature ..... -10 to 60 °C (14 to 140 °F)
- Storage Temperature ..... -40 to 80 °C (-40 to 176 °F)
- Humidity ..... 85 % Non-Condensing
- Enclosure Rating IP20
- Altitude ..... 2,000 m (6,562 ft) maximum
- Overvoltage Category II
- Pollution Degree 2

Certification ..... UL Listed

c UL us LISTED SWITCHES, IND CONT 19PF NRNT, NRNT7, E183688

UL508 Industrial Control Equipment
FCC

4.2 PGH High-Tension Couplers

Maximum Line Voltage:
PGH-5000 ..... 5,000 V ac
PGH-6000 ..... 6,000 V ac

Current to Ground..... 2.5 mA maximum

Terminal M Maximum
Voltage ..... 50 V ac

Terminals:
E, E, and M ..... Wire Clamping, 26 to 12 AWG (0.13 to 3.3 mm^2) conductors
Tightening Torque ..... 0.50 N·m (4.43 lbf·in)

⏚ ..... Wire Clamping, 10 AWG (5.3 mm^2) maximum

High Tension Lead A ..... 8 AWG (8.4 mm^2), 40 kVdc, 915 mm (36 in.)

5. ORDERING INFORMATION

PGR-3200-□

Supply
Blank – 240 V ac Supply(1)
120 – 120- or 24- V ac Supply

PGA-0510 ..... Analog Ohm Meter
PGH-5000 ..... 5 kV High Tension Coupler
PGH-6000 ..... 6 kV High Tension Coupler

NOTES:
(1) UL not available for this supply option.

6. PERFORMANCE TEST

6.1 Insulation Test

Perform this test with the starter open and appropriate lock-out procedures.

Connect a 20 kΩ resistor between one phase and ground at the line side of the starter or motor terminal box. Select a phase that is not connected to PGR-3200 terminal 2 (or the PGH-5000 or PGH-6000). The PGR-3200 will indicate a warning by lighting the 50 kΩ and 30 kΩ LEDs and energizing the 50 kΩ insulation relay.

Replace the 20 kΩ resistor with an 8 kΩ resistor.

The PGR-3200 will indicate an alarm by lighting the < 10 kΩ LED and energizing the 10 kΩ insulation relay.

APPENDIX A
PGR-3200 REVISION HISTORY

MANUAL RELEASE DATE	MANUAL REVISION	PRODUCT REVISION (REVISION NUMBER ON PRODUCT LABEL)
March 23, 2020	3-F-032320	01
April 9, 2018	3-E-040918	
November 19, 2015	3-D-111915	
August 4, 2015	3-C-080415	

Manual Revision History

REVISION 3-F-032320

SECTION 2

Updated remote-reset operation.

SECTION 3

Updated figures 1,2 and 3.

REVISION 3-E-040918

SECTION 4

Specifications added.

REVISION 3-D-111915

SECTION 4

Terminal torque specifications added.

SECTION 5

Ordering information updated.

REVISION 3-C-080415

Model name changed to Insulation Monitor.

SECTION 3

Figures 4, 5, and 6 updated.

SECTION 4

Output relay, dimension, and environment specifications updated.

Certifications updated.

Section 4.2 added.

SECTION 5

Ordering information updated.

APPENDIX A

Revision history added.

Product Revision History

PRODUCT REVISION 01

UL Certification.