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Davenport, IA 52807 | 800.280.9517 | 563.386.9639 (Fax)

INSTALLATION AND OPERATING INSTRUCTIONS

R-3W2

UL APPROVED FOR:
CLASS I, DIVISION 2 HAZ LOC
CE, CAT III & IV



www.pesd.com

BE SURE POWER IS SHUT OFF PRIOR TO INSTALLING THIS DEVICE!

Grace PESD® VOLTAGE INDICATOR R-3W2 UL NEC CLASS I, DIVISION 2 Patented



AUXILIARY DEVICE SUITABLE FOR USE IN CLASS I, DIVISION 2
(or ZONE 2), GROUPS A, B, C, DHAZARDOUS LOCATIONS, or
NONHAZARDOUS LOCATIONS ONLY

Class I Groups: A (acetylene), B (hydrogen), C (ethyl-ether vapors, ethylene or cyclopropane),
D (gasoline, hexane, naptha, benzene, butane, propane, alcohol, acetone, benzol, lacquer solvent
vapors, or natural gas)

Division 2 : Ignitable concentrations of gases, vapors, or liquids are not likely present under normal
operating conditions

Haz Loc Normal Atmospheric Conditions: a) -25°C to +40°C ambient b) 21% Max. Oxygen
concentration per volume c) barometric pressure range of 80 kPa (0.8 bar) to 110 kPa (1.1 bar)



EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT
WHILE THE CIRCUIT IS LIVE OR UNLESS THE AREA IS
KNOWN TO BE FREE OF IGNITABLE CONCENTRATIONS.



THIS PRODUCT CAN EXPOSE YOU TO CHEMICALS WHICH
ARE KNOWN TO THE STATE OF CALIFORNIA TO CAUSE
CANCER, BIRTH DEFECTS OR OTHER REPRODUCTIVE
HARM. FOR MORE INFORMATION, GO TO

WWW.P65WARNINGS.CA.GOV

WARNING: CANCER – REPRODUCTIVE HARM

Approvals:

UL LISTED file No. E334957
Per ISA 12.12.01-2007
CAT FILE No. E311256
per UL61010-1, 2ND Edition
CAN/CSA-C22.2 No. 61010-1, 2ND Edition

CAT III 1000V
CAT IV 600V 
DC or AC-rms to Ground
(Peak Impulse Transient 8000V
20 repetitions, 2 ohm source)

 
UL TYPE 4X
TYPE 12
TYPE 13
LISTED
IND. CONT. EQ.
HAZ. LOC. 42RV
46RD

Specifications:

 - Double Insulation Symbol

Input: AC SINGLE OR 3-PHASE: 40 to 600V $\sim$, *50/*60/400 Hz *UL approval

DC OR *STORED ENERGY*: 30 to 1000V ---, (Voltages Line-to-Line or Line-to-Ground)

Maximum Rating: 750V $\sim$ or 1000V --- @ 1.2 Watts, Operating Ambient Air of 55°C Max.

Detection Thresholds: 29V $\sim$, 40V $\sim$, 27V --- (typical cut-off)

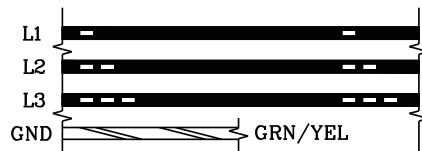
Temperatures

Operate: -20°C to +55°C, Code T5

Storage: -45°C to +85°C

Terminations: (4) 8 ft, 18 AWG, 90°C @ 1000V, UL-1452
PVC insulation w/ nylon jacket
L1- L3: Black w/ bar identification (Fig. 1)
GND: Green w/ Yellow stripe

Fig. 1



Housing: Black Noryl, totally encapsulated including LED:

O-Ring Seal: Blue VFMQ Florosilicone, UL approved material

Indicators: (8) Red Super Bright LED's

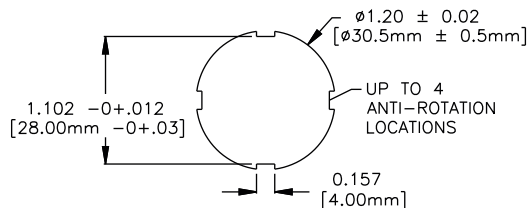


**EXPLOSION HAZARD – SUBSTITUTION OF ANY COMPONENT
MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2**

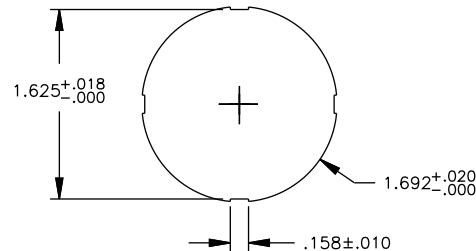
INSTALLATION AND OPERATING INSTRUCTIONS:

1. Design, wiring, and service of equipment for Hazardous Locations should only be preformed by qualified personnel familiar with local, state, and related national codes including National Electrical Code (NEC) articles 500, 505 & 506.
2. To meet UL TYPE 12, 13, or 4X sealing requirements, mount on a flat surface of an enclosure qualifying for a respective TYPE or NEMA rating or equivalent elevated ambient rating.
3. Locate the unit in visual proximity to the control panel ON/OFF disconnect and within wiring distance to incoming Main Lines and Earth Ground. Verify there is no interference with the free operation of the ON/OFF disconnect mechanism.
4. (a) For Standard Mount, refer to knock-out pattern below and Control Drawing No. 196 for assembly.

(b) For Low Profile Mount with R-3W2-KB kit, refer to knock-out pattern below and Control Drawing No. 198 for assembly.



Standard Knockout



Low Profile Knockout

*These labels install around the R-3W2 with no affect on its UL certification. The labels are not UL approved.

5. For Delta configured power, connect the 1 bar, 2 bar & 3 bar black wires to L1, L2, & L3 respectively (Fig. 1) on the fused or disconnect side of the 3-Phase line voltage. The Green/Yellow stripe (Grn/Yel) wire **MUST** be connected to Earth Ground. (Fig. 3)
6. Wye configured power with grounded Neutral is connected the same as for Delta in step 5. The Grn/Yel wire **DOES NOT** connect to the neutral but to non-current carrying Earth Ground.
Caution: The neutral will not be monitored for voltage by the Detector, only Phase-to-Phase and Phase-to-Ground voltage will be detected. To include neutral monitoring go to step 7.
7. Ungrounded or high resistance Wye configured power requires (2) additional units to include all possible voltages the Neutral line introduces. Wire as shown in Figure 2.
8. **Verifying Proper Operation:** First disconnect all equipment that may introduce a hazard and notify personnel before powering the panel!
(a) TURN POWER ON. With normal voltage applied, the L1, L2, and L3 indicator pairs will flash at rates according to the applied voltage (See table below).

INDICATOR FLASH RATES (L1, L2, L3, GND)

3 ~ LINE-TO-LINE (VAC)	<29	30	120	240	480	600	750
FLASHES / SEC (TYPICAL)	0	1.3	4.2	5.8	7.3	8.0	8.8
--- OR STORED ENERGY (VDC)	<27	30	48	110	300	600	1000
FLASHES/SEC (TYPICAL)	0	1.6	2.5	4.5	6.9	8.8	9.1

(Step 8 continued)

(b) GND Indicator Pair Operation: For isolated Delta or 3-Phase WYE applications, it is normal for the “GND” indicator pairs not to flash unless a phase is lost producing an unbalanced condition. This peculiarity results when the Phase-to-Phase voltages are balanced resulting in no current to a Neutral connection. The R-3W2 indicators are current driven; therefore, no net current in the R-3W2 ground line (connected to Neutral) will cause the “GND” indicators to not flash. A leakage resistance path from any phase-to-ground from 2-7 Meg ohms producing a corresponding current from 7-67 μA in the “GND” wire is adequate for the “GND” indicators to flash.

To complete proper installation, verify grounding of the GRD lead-wire. Under normal operation, the power system determines if GRD LEDs illuminate.

Proceed to GRD verification steps below.

- 1.) Apply power to the R-XXX, if the GRD LEDs do not illuminate, proceed to step 2.)
- 2.) Remove power and re-establish an electrical safe work condition to allow one phase lead-wire to be disconnected from its source by either disconnecting wire or pull a fuse.
- 3.) Re-apply power and verify that the GRD LEDs now illuminate to insure a proper ground connection.
- 4.) Complete installation by removing power and reconnecting the phase lead-wire or fuse and reapply power and re-verify that L1, L2, & L3 LEDs illuminate.

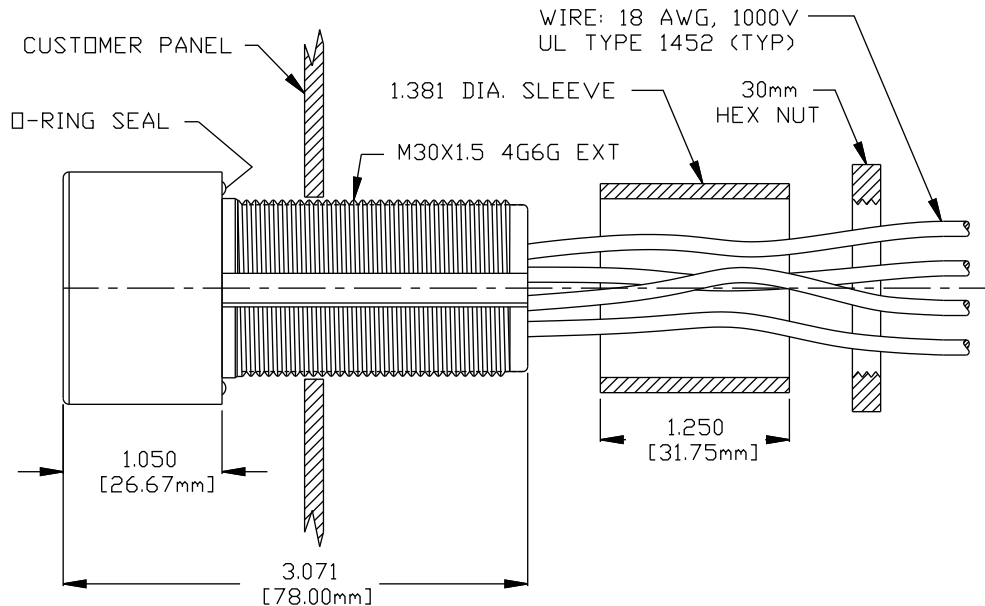
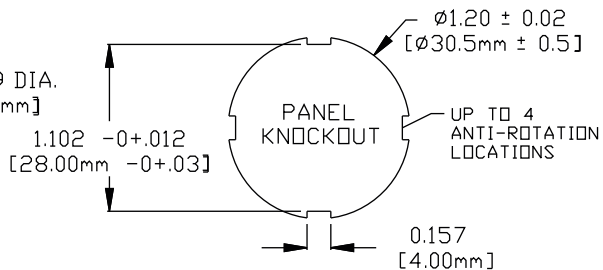
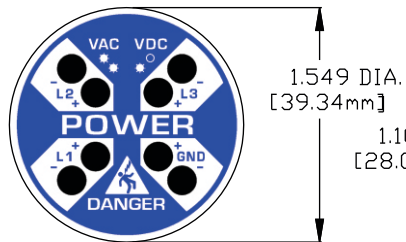


BEFORE OPENING A PANEL, TURN POWER OFF! (Steps 1-8 must first verify proper operation of indicators.)
SAFETY PROCEDURES STILL APPLY: Before working on an electrical conductor, verify zero electrical energy with proper voltage testing instrument and the proper procedure as per NFPA 70E 120.1(5), 120.2 (F)(2)(f)(1-6), OSHA 1910.333(b)(2)(iv)(B).

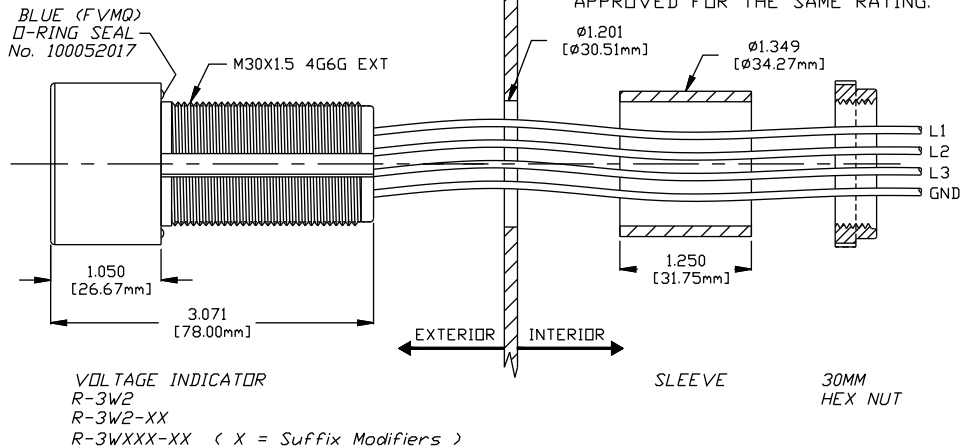
MAINTENANCE

1. For O-ring inspection, follow the respective Control Drawing directions pages 7 & 8.
2. For cleaning the front blue label or the information sticker, use only clean water and a soft cloth.

For additional information, see Grace Technical Info:
www.pesd.com



CONTROL DRAWING No. 196 CLASS 1 DIV2 GROUP A-D



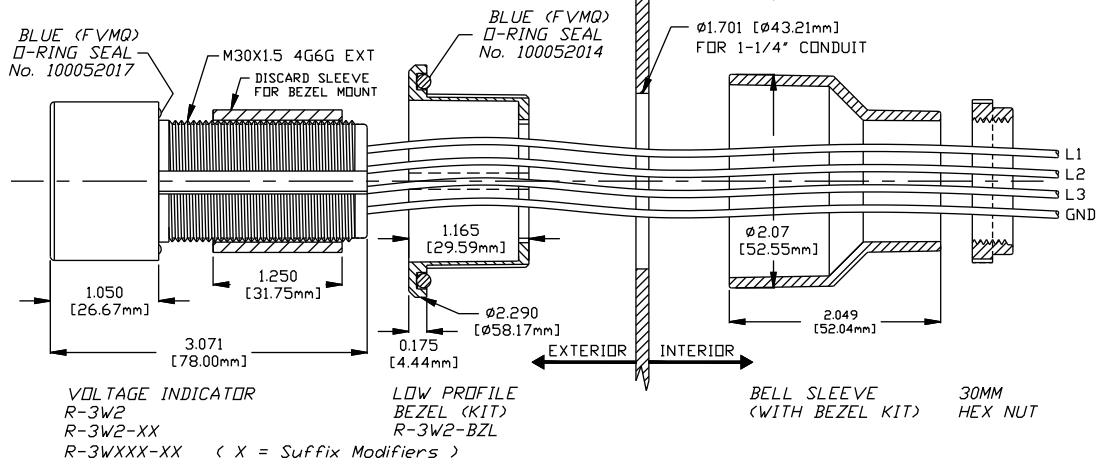
Installation Notes:

1. The mounting surface must be clean and smooth. Tighten the Hex nut until the head of the R-3W2 seats against the mounting surface so the O-ring is fully compressed. Do not overtighten.

Uninstalling for Inspection:

-  WARNING: EXPLOSION HAZARD. DO NOT UNINSTALL DEVICE UNLESS POWER HAS BEEN DISCONNECTED OR THE AREA IS KNOWN TO BE FREE OF IGNITIBLE CONCENTRATIONS OF FLAMMABLE GASES OR VAPORS.
-  WARNING: EXPOSURE TO SOME CHEMICALS MAY DEGRADE THE SEALING PROPERTIES OF THE FLUOROSILICONE (FVMQ) O-RING SEAL.
 1. Periodic inspection of the O-ring seal is recommended. Replace O-ring if any degradation is found.
 2. For replacement O-ring, use part number 100052017.
-  WARNING: SUBSTITUTION OF O-RING No. 100052017 MAY VOID SUITABILITY FOR DIV 2.

CONTROL DRAWING No. 198 CLASS 1 DIV2 GROUPS A-D



Installation Notes:

1. The mounting surface must be clean and smooth. Tighten the Hex nut until the outside ledge of the Bezel seats against the mounting surface so the O-ring is fully compressed. Do not overtighten.

Uninstalling for Inspection:

- ⚠ WARNING: EXPLOSION HAZARD. DO NOT UNINSTALL DEVICE UNLESS POWER HAS BEEN DISCONNECTED OR THE AREA IS KNOWN TO BE FREE OF IGNITIBLE CONCENTRATIONS OF FLAMMABLE GASES OR VAPORS.
- ⚠ WARNING: EXPOSURE TO SOME CHEMICALS MAY DEGRADE THE SEALING PROPERTIES OF THE BLUE FLUOROSILICONE (FVMQ) O-RING SEALS.
 1. Periodic inspection of the (2) O-ring seals is recommended. Replace the O-ring(s) if any degradation is found.
 2. For replacement of the R-3W2 O-ring, use part number 100052017. For replacement of the Bezel O-ring, use part number 100052014.
- ⚠ WARNING: USING O-RING SUBSTITUTION PARTS MAY VOID SUITABILITY FOR DIV 2.

Standard Mount



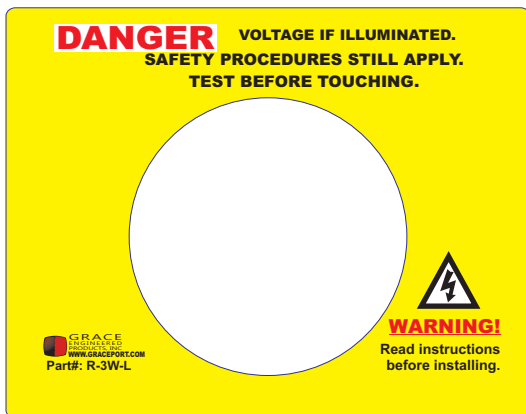
R-3W2

Bezel Mount



R-3W2-BZL

**Many other variations available upon
request. Please call 1-800-280-9517 or visit
www.pesd.com**



Part#: R-3W-L*



Part#: R-3W-NP-F*

*These labels install around the R-3W2 with no affect on its UL certification. The lables are not UL approved.

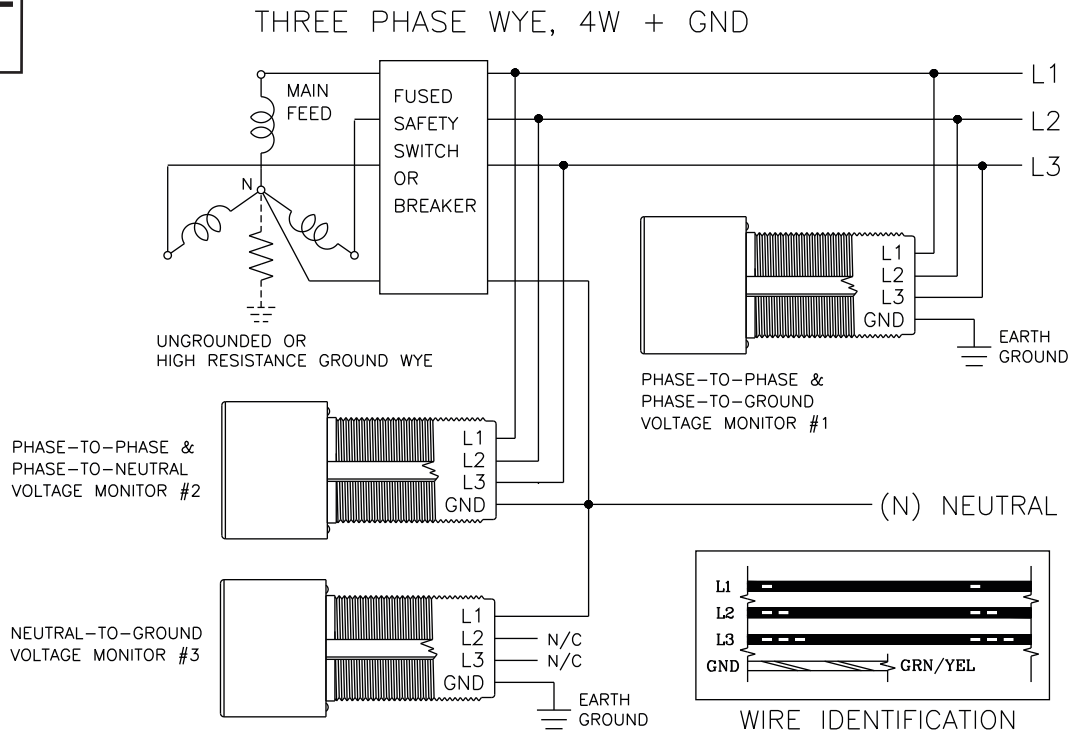


Fig. 2

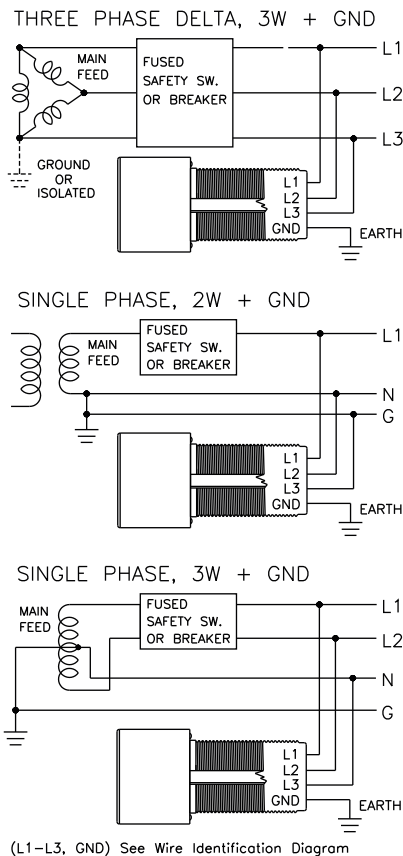


Fig. 3

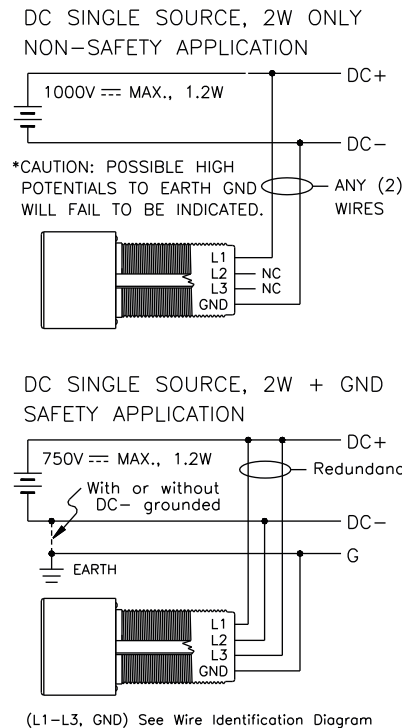


Fig. 4

