

For technical questions, contact: Grace Engineered Products Inc.  
1515 E. Kimberly Rd | Davenport, IA-52807 | 1.800.280.9517 | fax: 563.386.9639

# INSTALLATION AND OPERATING INSTRUCTIONS

## **R-3W-DC Voltage Indicator**

UL Types 4, 4X, 12 & 13

R-3W-DC Voltage Indicators are meant be used in DC applications to verify the voltage presence.  
This product may also be used in Single phase, 3 wire AC applications.



[www.pesd.com](http://www.pesd.com)

**Approvals:**

UL LISTED file No. E256847  
Per ISA 12.12.01-2007

- Input:** DC OR STORED ENERGY: 15 to 1000VDC  $\text{---}$ , (LINE-TO-LINE or LINE-TO-GND).  
839VDC  $\text{---}$  Max. with one line shorted to GND (worst case leakage).  
All @ 55°C & @ 1.2 Watts Max
- AC SINGLE or 3-PHASE: 20 to 600VAC  $3 \sim$  50/60 Hz (LINE-TO-LINE or LINE-TO-GND).  
Includes allowance for one line shorted to GND @ 55°C Max.
- Maximum Rating:** 1000VDC  $\text{---}$  (2-WIRE ONLY) or 750VAC  $3 \sim$  (3-WIRE) at +55°C
- Detection Thresholds:** 15VDC  $\text{---}$  or 18.5VAC  $3 \sim$  (TYPICAL CUTOFF)
- Temperatures:** Operate : -40°C to +55°C  
Storage : -45°C to +55°C
- Terminations:** (3) 8 ft wires, 18 AWG 1000V, UL-1452  
PVC insulation w/nylon jacket
- Housing:** Black Noryl, totally Encapsulated for Environment Protection
- O-Ring Seals:** Blue FVMQ Fluorosilicone, UL approved material
- Indicators:** (6) Red Super Bright LEDs



IND. CONT. EQ. 496Y



UL TYPE 4  
TYPE 4X  
TYPE 12  
TYPE 13

**WIRE IDENTIFICATION**

POS	NEG	GND
RED	YEL	GRN/YEL

**SYMBOL IDENTIFICATIONS**

$3 \sim$  3 Phase AC rms  $\text{---}$  DC Volts



Electric Shock Danger of Death



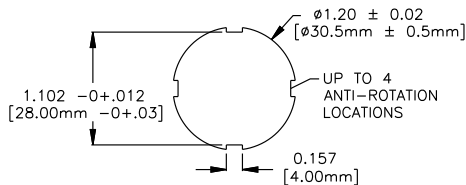
Caution



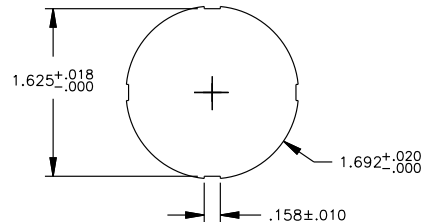
Double Insulated Symbol

## Installation and Operating Instructions

1. Design, wiring, and service of equipment 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 4, 4X, 12 and 13 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. 210 for assembly.
- (b) For Low Profile, with R-3W-KB kit, refer to knock-out pattern below and Control Drawing No. 211 for assembly.



**Standard Knockout**



**Low Profile Knockout**



5. **OPERATION:** With the GRN/YEL (GND) wire connected to earth ground, R-3W-DC visually alerts the presence of dangerous DC (Stored Energy) or AC potentials occurring between any combination of the three monitored input lines (POS, NEG & GND). Two LED indicators are assigned to each input line designated “+” and “-”. **A DC or Stored Energy** potential will illuminate the “+” LED for the positive line and the “-” LED for the negative line. Should any two lines have a **AC potential** condition, both “+” and “-” LED pairs will be active. Leakage current from either the POS or NEG line to the ground will cause the respective “+” and “-” GND LEDs to illuminate.

6. **VERIFYING PROPER OPERATION:** First disconnect all equipment that may introduce a hazard and notify personnel before powering the panel! **TURN POWER ON.** With normal voltage applied, the POS, NEG and GND indicator pairs will flash at rates according to the applied voltage (See table below).

#### **INDICATOR FLASH RATES (POS, NEG, GND)**

ANY 2 WIRE COMBO (VDC --- )	<15	20	48	110	300	600	1000
FLASHES/SEC (TYPICAL)	0	1.0	2.2	3.1	4.3	4.5	4.8

***Epileptic Photosensitivity Compliance: Below 5-30 Flashes/Sec***

 **WARNING**

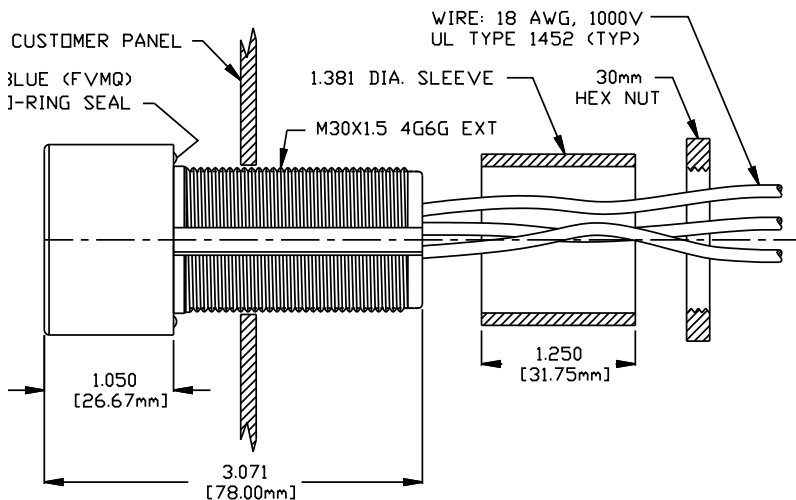
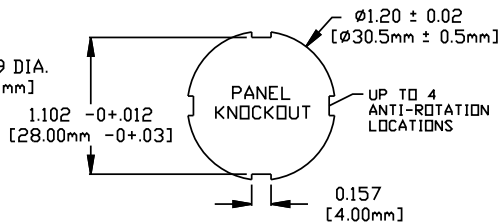
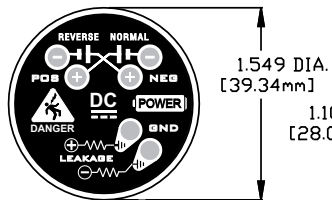
**BEFORE OPENING A PANEL, TURN POWER OFF!** (Steps 1-6 must first verify proper operation of indicators.) **SAFETY PROCEDURES STILL APPLY:** Before working on an electrical conductor, verify zero electrical energy with proper voltage testing instrument and the proper procedure as per NFPA 70E Article 120.5.

 **AVERTISSEMENT**

**COUPER L'ALIMENTATION AVANT D'OUVRIER UN PANNEAU !** (Les étapes 1 à 6 servent tout d'abord à vérifier le bon fonctionnement des indicateurs.) **LES CONSIGNES DE SÉCURITÉ SONT TOUJOURS APPLICABLES :** avant de travailler sur un conducteur électrique, vérifier que l'énergie électrique est nulle à l'aide d'un instrument de détection de tension convenable et la procédure appropriée selon NFPA 70E Article 120.5.

## MAINTENANCE

1. For O-ring inspection, follow the respective Control Drawing directions pages 8 & 9.
2. For cleaning the front label or the information sticker, use only clean water and a soft cloth. To complete proper installation, verify grounding of the GND lead-wire. Under normal operation, the power system determines if GND LEDs illuminates.





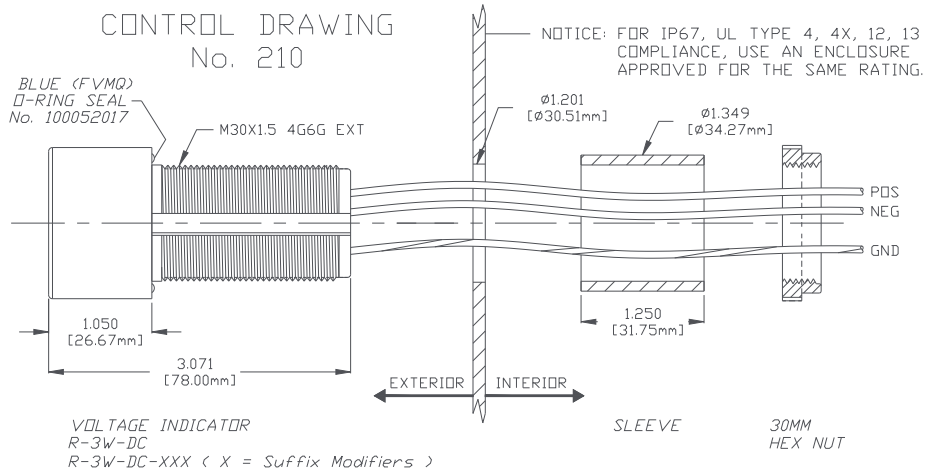
### GND DETECTOR THRESHOLDS @ ~40% INTENSITY (LEAKAGE LINE-TO-GND)

LINE-TO-LINE VOLTAGE (VDC --- )	20	48	110	300	600	1000
LINE-TO-GND CONTINUITY (OHMS)	4M	5M	7M	14M	23M	31M
DETECTOR INDUCED LEAKAGE ( $\mu$ A)	1.6	3.6	6.5	10	12.5	15.6

### DETECTOR INDUCED FAULT CURRENT (LINE-TO-GND SHORT)

LINE-TO-LINE VOLTAGE (VDC --- )	20	48	110	300	600	1000
0 $\Omega$ LINE-TO-GND CURRENT (DC $\mu$ A)	11	30	73	206	419	703

CONTROL DRAWING  
No. 210



Installation Notes:

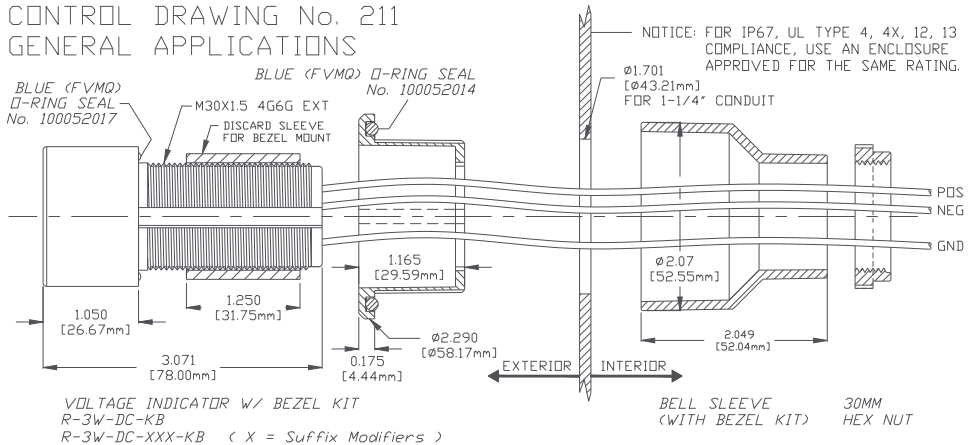
1. The mounting surface must be clean and smooth. Tighten the Hex nut until the external head seats against the mounting surface so the O-ring is fully compressed. Do not overtighten.

Uninstalling for Inspection:

- ⚠** WARNING: EXPOSURE TO SOME CHEMICALS MAY DEGRADE THE SEALING PROPERTIES OF THE FLUOROSILICONE FVMQ O-RING SEAL. FOR REPLACEMENT, USE PT. NO. 100052017.
- ⚠** WARNING: SUBSTITUTION OF O-RING No. 100052017 OR ASSEMBLY PARTS MAY VOID SUITABILITY FOR LOCATION.
1. Periodic inspection of the O-ring seal is recommended. Replace O-ring if any degradation is found.



CONTROL DRAWING No. 211  
GENERAL APPLICATIONS



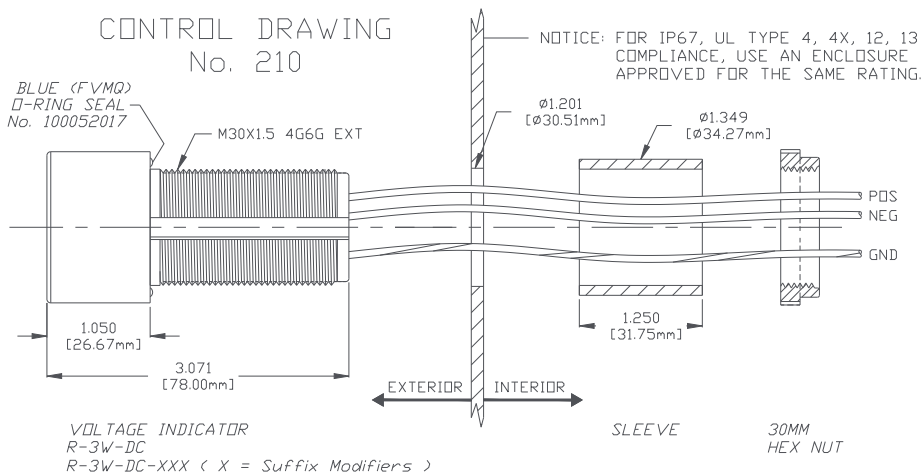
Installation Notes:

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: EXPOSURE TO SOME CHEMICALS MAY DEGRADE THE SEALING PROPERTIES OF FLUOROSILICONE (FVMQ) O-RING SEALS, REFER TO A CHEMICAL COMPATABILITY CHART.**
- ⚠ WARNING: SUBSTITUTION OF O-RINGS OR ASSEMBLY PARTS MAY VOID SUITABILITY FOR LOCATIONS.**
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 UPA O-ring, use part number 100052017.  
For replacement of the Bezel O-ring, use part number 100052014.

## CONTROL DRAWING No. 210



### Remarques sur l'installation :

1. La surface de montage doit être propre et lisse. Serrer l'écrou hexagonal jusqu'à ce que la base externe repose sur la surface de montage, de façon à ce que le joint torique soit complètement comprimé.  
Ne pas trop serrer.

### Démontage pour l'inspection :



AVERTISSEMENT : L'EXPOSITION À CERTAINS PRODUITS CHIMIQUES PEUT DÉGRADER LES PROPRIÉTÉS D'ÉTANCHÉITÉ DU JOINT TORIQUÉ EN FLUOROSILICONE (FVMQ). POUR REMPLACER LE JOINT, UTILISER LE NO. DE PIÈCE 100052017.

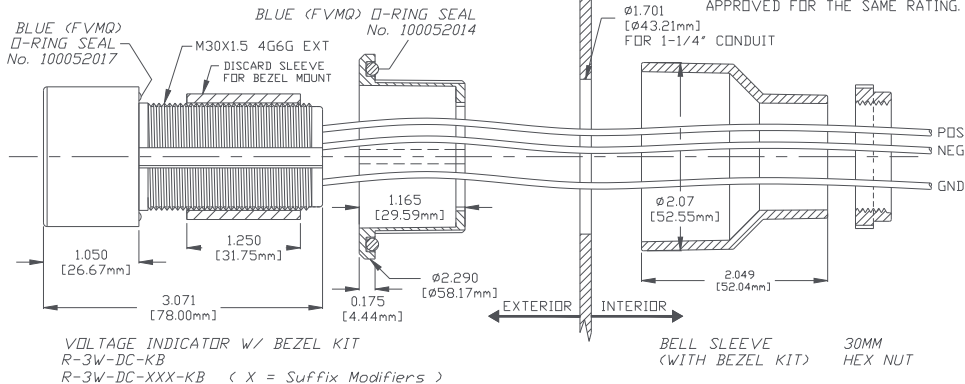


AVERTISSEMENT : LA SUBSTITUTION DU JOINT TORIQUÉ No 100052017 OU DE PIÈCES DE L'ASSEMBLAGE PEUT ANNULER LA CONVENANCE À L'EMPLACEMENT.

1. L'inspection périodique du joint torique est recommandée. Remplacer le ou les joint(s) torique(s) si des signes de dégradation sont détectés.

# CONTROL DRAWING No. 211

## GENERAL APPLICATIONS



### Remarques sur l'installation :

1. La surface de montage doit être propre et lisse. Serrer l'écrou hexagonal jusqu'à ce que le bord extérieur de la collerette repose sur la surface de montage, de façon à ce que le joint torique soit complètement comprimé. Ne pas trop serrer.

### Démontage pour l'inspection :

- ⚠ AVERTISSEMENT : L'EXPOSITION À CERTAINS PRODUITS CHIMIQUES PEUT DÉGRADER LES PROPRIÉTÉS D'ÉTANCHÉITÉ DES JOINTS TORIQUES EN FLUOROSILICONE (FVMQ). SE RÉFÉRER AU TABLEAU DE COMPATIBILITÉ CHIMIQUE.**

**⚠ AVERTISSEMENT : LA SUBSTITUTION DU JOINT TORIQUE No 2 OU DE PIÈCES DE L'ASSEMBLAGE PEUT ANNULER LA CONVENANCE AUX EMPLACEMENTS.**

  1. Il est recommandé d'inspecter les deux joints toriques périodiquement. Remplacer le ou les joint(s) torique(s) si des signes de dégradation sont détectés.
  2. Pour le remplacement du joint torique UPA, utiliser le numéro de pièce 100052017.  
Pour le remplacement du joint torique de la collerette, utiliser le numéro de pièce 100052014.

**Standard Mount**



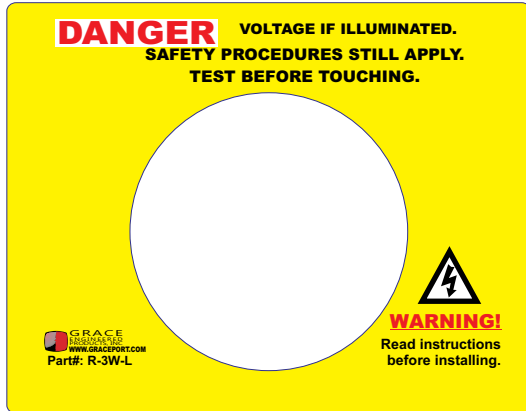
**R-3W-DC**

**Bezel Mount**



**R-3W-KB**

**Many other variations available upon request.  
Please call 1-800-280-9517 or visit [www.pesd.com](http://www.pesd.com)**

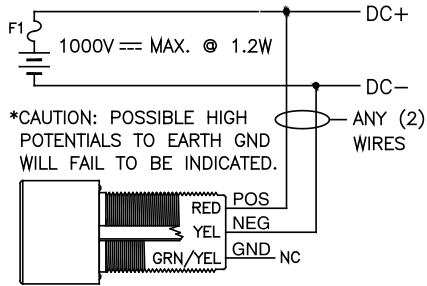


**Part#: R-3W-L\***



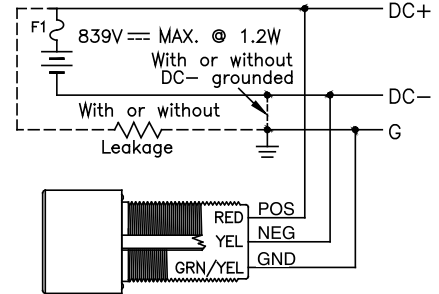
**Part#: R-3W-NP-F\***

DC SINGLE SOURCE, 2W ONLY  
NON-SAFETY APPLICATION



\*CAUTION: POSSIBLE HIGH POTENTIALS TO EARTH GND WILL FAIL TO BE INDICATED.

DC SINGLE SOURCE, 2W + GND  
SAFETY APPLICATION



AC SINGLE PHASE, 2W + GND

