Grace Voltage Indicators are Permanent Electrical Safety Devices (PESDs) that visually represent presence of voltage with flashing or non-flashing redundant LED lights.

- Typically hardwired to the load side of a disconnect switch on a MCC bucket or a Variable Frequency Drive, Voltage Indicators illuminate whenever hazardous voltage or stored energy is present in the system.

VOLTAGE INDICATOR FEATURES

- Grace Voltage Indicators are Permanent Electrical Safety Devices (PESDs) that visually represent presence of voltage with flashing or non-flashing redundant LED lights.
- R-3W Series Voltage Indicators are suitable for both AC and DC applications from 40-600VAC and 30-1000VDC is a one-size-fits-all solution that detects 3-phase AC/DC voltage.
- Safely and productively visualizes zero energy presence and enhances compliance to OSHA & NFPA 70E/CSAZ462, when installed and verified by a qualified electrician and incorporated into the facility’s electrical safety procedure.

FREQUENTLY ASKED QUESTIONS

Q: How do I know if the Voltage Indicator is working?
A: Once the Voltage Indicator is installed and verified by a qualified electrician and documented in the drawings and safety procedures, a task qualified person can identify the status of the device functionality from outside the cabinet. For example, if ANY of the LEDs are “ON” in a voltage indicator after throwing the disconnec switch to “OFF” this triggers additional tests and verification of the deenergized state by a qualified electrician.

Q: What is CAT III & CAT IV rating and why is it important for PESDs?
A: The CAT III & IV ratings defines the overvoltage installation categories that applies to low voltage systems of <1000Volts measuring and test equipment as defined in IEC 1010 and UL61010-1 standards. The rating of our voltage indicators allows their use as permanently mounted test equipment used in fixed installations such as switchgear, MCCs, bus and feeder in industrial plants and low voltage connections made to utility power.

Q: Do the R-3W series voltage indicators have internal short circuit protection?
A: Yes, the voltage indicator is protected by high impedance circuitry and recognized components that limit the power to 1.2 watts @ 750 Volts AC. The following chart gives the phase to ground short circuit currents.

<table>
<thead>
<tr>
<th>Voltage Indicator included Fault Current (PHASE-TO-GROUND SHORT)</th>
<th>3 Phase Line-To-Line (VAC)</th>
<th>0 OHM Phase-To-Ground Current (µA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 120 240 480 750</td>
<td>28 108 219 455 730</td>
<td></td>
</tr>
</tbody>
</table>

Q: Why are the GND LEDs “ON” in my delta connected system with isolated ground?
A: On a balanced 3 Phase, Delta Configuration, the GND light will be off. If it is on, it is either because of an unbalanced system or voltage on the GND. Test the system to ensure balance, as little as 11% voltage imbalance will start to turn on the LEDs and will fully illuminated by 15%. (Percentage is calculated by \[(AV-UV)/AV\] where AV=Average Voltage and UV=Unbalanced Voltage. Check to ensure no voltage on ground.

Q: What is the NEC feeder tap rule?
A: Yes, PESDs do not have an output relay or auxiliary contacts. These devices are meant for verifying the presence and absence of voltage at the connected source only.

Warning: Verify an electrical conductor has been de-energized using an adequately rated test instrument before working on it. Follow appropriate Energy Control (Lockout/Tagout) procedures as per OSHA Subpart S.

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FOR MORE INFORMATION VISIT PESD.COM OR CALL 1.800.280.9517
**OPERATION**

Grace Voltage Indicators are self powered, UL listed, and permanently installed devices that visually represent presence of voltage with flashing or non-flashing, redundant LED lights. Typically hardwired to the load side of an electrical feeder or a disconnect switch, voltage indicators illuminate whenever hazardous voltage is present in any individual phase. Voltage indicators greatly assist task qualified personnel with enhanced productivity and reduced risk while performing mechanical and electrical LOTO tasks by verifying the release of stored electrical energy per Article 120.5(4) of NFPA 70E:2018

**TECHNICAL SPECIFICATIONS**

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>CODE</th>
<th>COMBO VI</th>
<th>CAT III &amp; IV RATED*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Indicator</td>
<td>R-3W</td>
<td>Flashing LEDs</td>
<td>CAT III &amp; IV RATED*</td>
</tr>
<tr>
<td>R-3W-SR</td>
<td>Non-Flashing LEDs</td>
<td>AC/DC</td>
<td></td>
</tr>
<tr>
<td>R-3W2</td>
<td>Flashing LEDs</td>
<td>DC</td>
<td></td>
</tr>
<tr>
<td>R-3F2</td>
<td>LED Type</td>
<td>AC/DC</td>
<td></td>
</tr>
<tr>
<td>R-3W-3DC</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>R-3D2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Voltage**

- **Type**
  - AC/DC
  - DC
  - AC/DC

**Mounting Location**

- External (Door/Frame mounted)
- External (Conduit Knockout)

**Voltage to Door Required**

- Yes
- No
- Yes

**Temperature Range**

- Storage
  - -45°C to +85°C
  - -45°C to +55°C
  - -45°C to +85°C

- Operational
  - -20°C to +55°C
  - -40°C to +55°C
  - -20°C to +55°C

**Voltage Range**

- Operational
  - 30 - 1000VDC
  - 50/60/400Hz
  - 40 - 600 VAC

**Operational Temperature Range**

- 30 - 1000VDC
- 30 - 1000VDC
- 30 - 1000VDC
- 20 - 600 VAC
- 20 - 600 VAC
- 20 - 600 VAC

**Wire Specifications**

- PVC Insulated with Nylon Jacket
- PVC Insulated with nylon jacket
- PVC Insulated with nylon jacket
- PVC Insulated with nylon jacket
- PVC Insulated with nylon jacket
- PVC Insulated with nylon jacket

**Fiber Optic Length**

- N/A
- Available in: 24", 36", 45", and 72"
- N/A
- N/A

**Certifications**

- UL Listed (#256847) Type 4, 4X, 12, 13 CAT III, IV
- UL Listed (#34597) Type 4X, 12, 13 CAT III, IV
- UL Listed (#34597) Type 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 CAT III, IV

**Wiring Requirements**

- 1 1/2 conduit vertical
- 30mm Pushbutton Hole
- 3/4" or M20 conduit knockout

**ACCESSORIES**

- Door Mount Kit with 6' cable: R-3W-DR-C6
- Door Mount Kit with 4' cable: R-3W-DR-C4
- Door Mount Kit with 8' cable: R-3W-DR-C8

**LABELS**

- Standard Label: R-3W-L*
- Standard Flange-Mount Label: R-3W-NP-F*
- Label for Bezel: R-3W-KB-L*

**COMBINATION UNITS**

Grace PESD® Combination Units take our voltage indicator and portal PESDs and couple them together with our custom labels. With our voltage indicator and portal connected to the same source, a task qualified worker or a qualified electrician can perform both presence and absence of voltage tests by using either a Non-Contact Voltage Detector (NCVD) pen or an adequately rated portable test instrument. Combination Units are available to order with custom procedure labels and NCVD pens.

**FOR MORE INFORMATION VISIT PESD.COM OR CALL 1.800.280.9517**

Warning: Verify an electrical conductor has been de-energized using an adequately rated test instrument before working on it. Follow appropriate Energy Control (Lockout/Tagout) procedures as per OSHA Subpart S.
R-3W SERIES DOOR CUTOUT FOR MOUNTING

R-3W SERIES WIRING CONFIGURATIONS

AC APPLICATIONS

THREE PHASE DELTA, 3W + GND

UNGROUNDED OR HIGH RESISTANCE GROUNDED WYE

SINGLE PHASE, 3W + GND

WIRE IDENTIFICATION

Applying to R-3W: select R-3W-3P, R-3W2 and R-3F2

Looking for a 5-wire option? Contact your local Sales Representative for more details.

FOR MORE INFORMATION VISIT PESD.COM OR CALL 1.800.280.9517

Warning: Verify all electrical conductors have been de-energized using an adequately rated test instrument before working on it. Follow appropriate Energy Control (Lockout/Tagout) procedures as per OSHA Subpart S.

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UL Listed RoHS
For isolated 3-phase systems, it is normal for the GND indicator LED pair to illuminate only during an
For UL compliance use same rated enclosure
For UL compliance (Type 4X, 12, & 13) use same rated enclosure
For UL compliance
For isolated 3-phase systems, it is normal for the GND indicator LED pair to illuminate only during an
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Medium Voltage Indicator assist the qualified personnel to visually verify the presence of voltage inside a MV cabinet. The indicator directly bolts on to the main busbar using a 1/2" ring style connector and uses capacitive coupling between the device and ground for completing the flashing circuit without a hard wired connection. The flash rate and the intensity of the indicator’s LED is determined by the line voltage, distance to the adjoining phases, and distance of the ground plane. Flash rates of the indicators are optimized to alert at least once in every 3 seconds.*

Disclaimer: It is recommended that an installed medium voltage indicator flashes at least 20 times per minute. If the flash rate is less than 20 times per minute, do not use the product in this application.

* Operating at lower flash rates is not recommended. If the flash rate is less than 20 times per minute, do not use the product in this application.

R-1V SERIES MEDIUM VOLTAGE INDICATOR DETAILS

Medium Voltage Indicator assist the qualified personnel to visually verify the presence of voltage inside a MV cabinet. The indicator directly bolts on to the main busbar using a 1/2" ring style connector and uses capacitive coupling between the device and ground for completing the flashing circuit without a hard wired connection. The flash rate and the intensity of the indicator’s LED is determined by the line voltage, distance to the adjoining phases, and distance of the ground plane. Flash rates of the indicators are optimized to alert at least once in every 3 seconds.*

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