




Voltage Presence Indicator + Test Ports


The Nukleus Voltage Presence Indicator + Test Ports (VPI+TP) is a Voltage Presence Indicator with Test Ports designed to improve electrical safety by combining two essential functions in one device.



The Voltage presence indicator + test ports (VPI+TP) provides a clear visual indication of live voltage through high-intensity LEDs and offers built-in Test Ports that allow safe metered verification of absence of voltage, eliminating the need to open enclosures. By streamlining lockout/tagout procedures and reducing direct exposure to energized conductors, the Nukleus VPI+TP enhances safety, efficiency, and compliance in electrical maintenance while being compact, durable, and easy to install in industrial environments.

Read this document in FULL before installation and operating this device:

-  To reduce the risk of injury, user must read instruction manual.
-  Updates or revisions may be issued with or without prior notification. Users should consult the company website for the most current version.
-  Product must be installed as per the instructions provided in the manual.

-  For assistance with installation/ operation OR troubleshooting, please contact our technical support team.

Email Support: customersupport@nukleustek.com

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⚠️ Ensure that power is completely disconnected before installing this device.

⚠️ CAUTION

- Always connect the GRN/YEL (GND) conductor to earth ground.
- The device location and internal wiring must allow unobstructed operation of the ON/OFF disconnect mechanism.
- A means of anti-rotation is required. Refer to the knock-out area for one or more-tab locations.
- The Door Gasket is made of Nitrile NBR. Consult a Chemical Compatibility Chart to ensure suitability for your application.
- Do not operate this product above 1000 VAC/1500 VDC at 55°C ambient, altitudes above 2000m, or relative humidity above 80%.
- Using this product in a manner not specified in this documentation may compromise its protection features and may pose safety risk.
- Device terminations must be fully protected along their entire length to prevent damage to insulation that could result in a short circuit or ground fault. Refer to UL 508A Paragraphs 29.4.2 and 29.4.4(b) for acceptable protection methods.

⚠️ WARNING

- Explosion Hazard – Do not disconnect this equipment while the circuit is energized unless it is confirmed that the area is free of ignitable concentrations.
- The use of an Overcurrent Protection Device (OCPD) or fuse is not recommended in safety applications where this device is used to verify the voltage presence.
- A blown fuse or tripped circuit breaker in series with this device may result in a false negative voltage indication, even when voltage is still present.
- This device has been tested and approved as equivalent to overcurrent protection for compliance with tap conductor requirements.

Manual Contents

- Introduction / Product Overview
- Safety information & general warnings
- System Configuration
- Schematics & Wiring Diagrams
- Technical specifications
- Product Dimensions
- Labels
- Installation instructions
- Operating instructions
- Maintenance
- LED Indications
- Warranty information

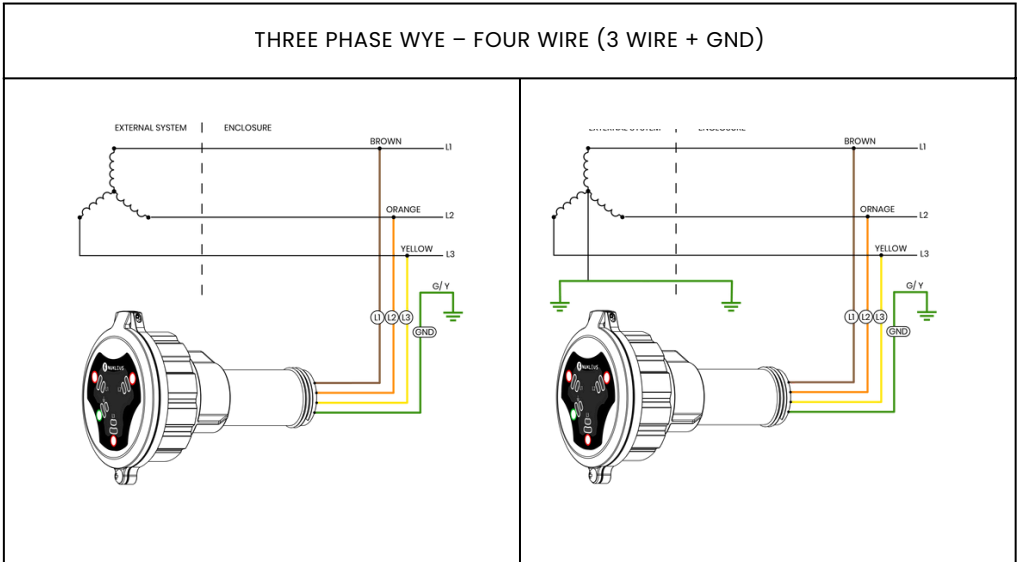
The diagrams below support three-phase, four-wire AC systems; single-phase, three-wire AC systems; and DC wiring configurations (four-wire configurations may also be used for three-wire systems). Indication behavior depends on system topology.



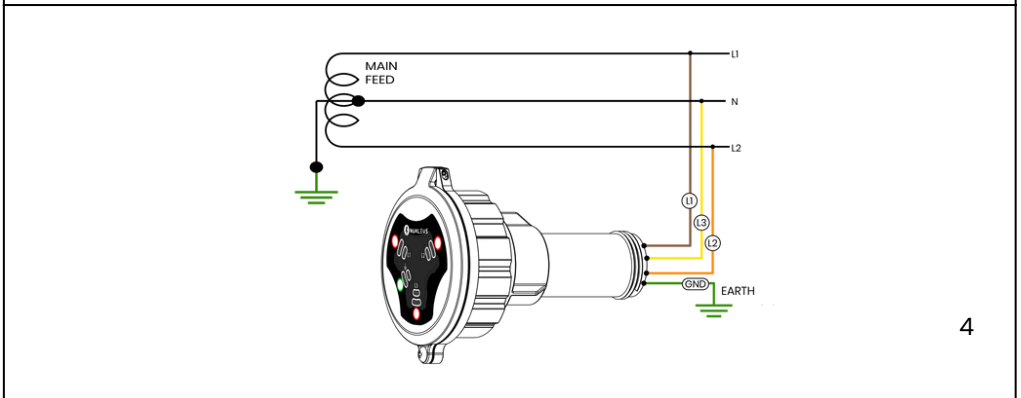
SCHEMATICS AND WIRING DIAGRAMS

The diagrams below illustrate supported system wiring configurations. Indication behavior depends on system topology and available conductors:

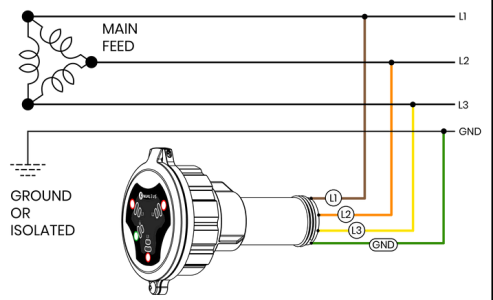
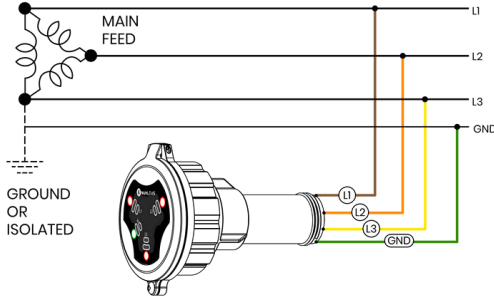
THREE PHASE WYE – FOUR WIRE (3 WIRE + GND)



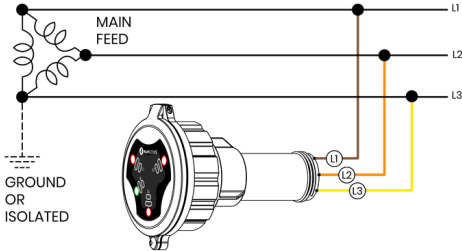
SPLIT PHASE (3 WIRE + GND)



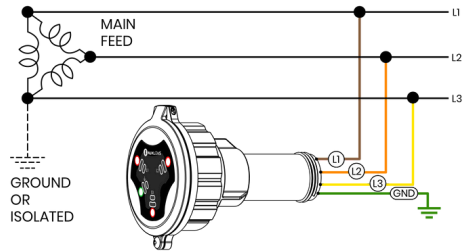
THREE PHASE DELTA, 4 WIRE (3 WIRE + GND)



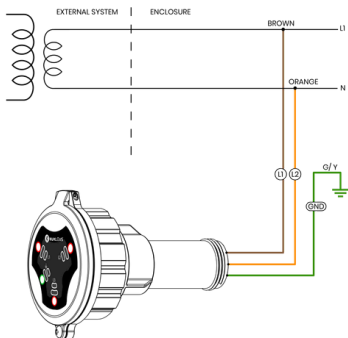
CORNER DELTA, 3 WIRE



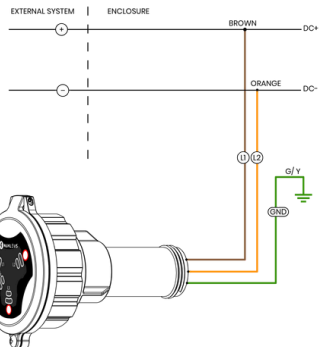
CORNER DELTA, 3 WIRE + GND



AC SINGLE PHASE: 3 WIRE (2 WIRE + GND)



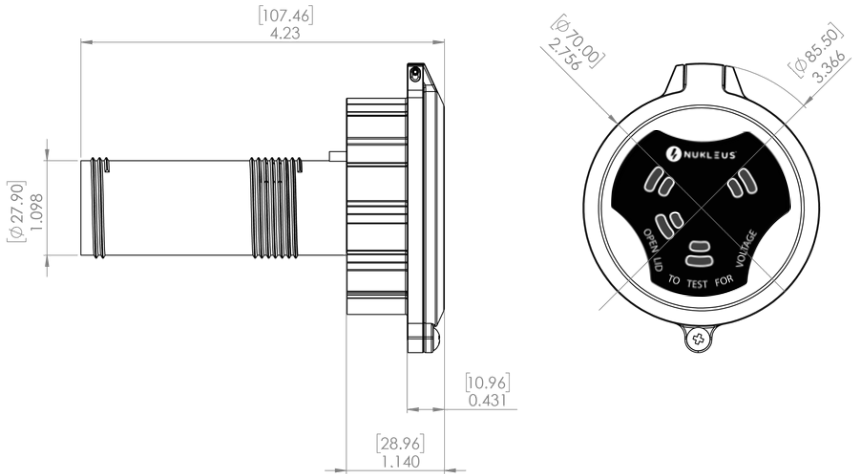
DC: 3 WIRE (2 WIRE + GND)



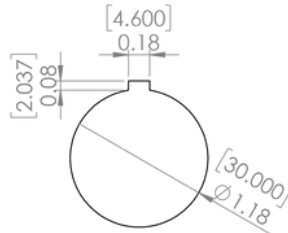
Specification	Details
Voltage Range	Test Ports: AC single-phase and three-phase: 0–1000 VAC @ 50/60/400 Hz, DC Voltage: 0–1500 VDC Voltage Indicator: AC single-phase and three-phase: 20–1000 VAC, 50/60/400 Hz, DC Voltage: 40–1500 VDC
Maximum Voltage	1000 VAC and 1500 VDC
Detection Thresholds	20 VAC and 40 VDC
Output Accuracy	–7% of applied voltage when measured with a 10 MΩ input impedance voltmeter connected between any two (2) test ports.
Internal Resistance	Test Ports: (4) 100 kΩ × 2, 1W 1% tolerance resistors in series encapsulated between each input wire and the respective test ports.
Single fault failure current	Maximum single-component failure fault current at 1000 VAC or 1500 VDC is <3.5mA with a momentary short between any two (2) test ports.
Temperatures	Operating Temperature: –40 °C to +55 °C Storage Temperature: –45 °C to +85 °C
Altitude	Up to 2000 meters (6600 feet)
Terminations	4-Wire leads: 8 ft, 14 AWG, 90 °C @ 1000 V, UL-1032, PVC-insulated with nylon jacket
Voltage Category Ratings	CAT III @ 1000 VAC max, CAT IV @ 600 VAC max; Pollution Degree 2
Indicators	8 Bright Redundant LEDs
Housing	UL-approved material, totally encapsulated including LEDs for environmental protection
Dimensions	Indicator module – 85.51 mm x 107.46 mm (HØ x D), standard 30 mm Ø mounting hole

Indicator Module

Units = Inches (mm)

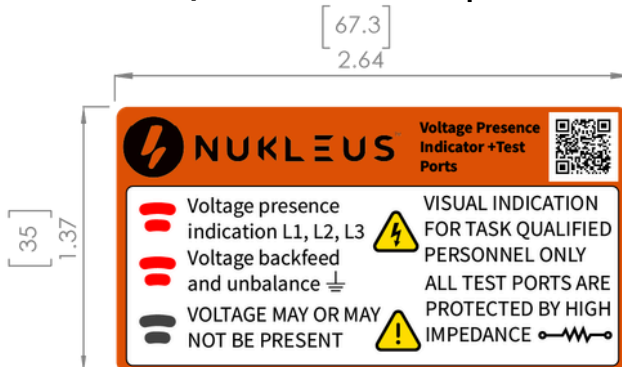


Panel Cutout



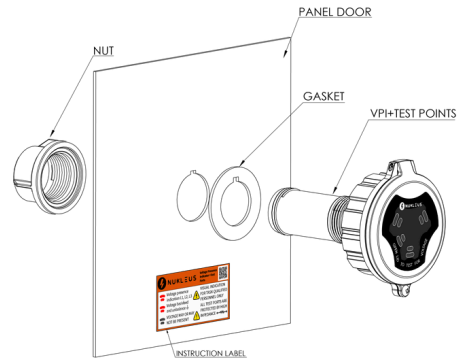
LABELS

User interface label (to be fixed next to the product on the panel door)



INDICATOR MODULE AND INSTRUCTION LABEL

Insert the indicator module onto the standard 30mm hole on the panel door and tighten the panel nut until both the nut and gasket are flush against the enclosure surface, then apply an additional 1/4 turn. Affix the instruction label to the exterior of the enclosure near the indicator module of the VPI+TP.



Ensure the mounting surface is clean and level. Tighten the hex nut until the VPI+TP head rests firmly against the surface, fully compressing the Door Gasket. Avoid overtightening.

- Follow all Local, State, and National Electrical Codes when installing this equipment. The use of overcurrent protection is not recommended for this device. However, if the device leads are extended beyond the supplied length or if the installation extends outside the enclosure where the leads are terminated, overcurrent protection for the supply leads may be required by Local, State, or National Electrical Codes. Any overcurrent protection installed must comply with the NEC (NFPA 70) or applicable end-product standards for the final installation.
- To meet UL Type 4X, 12, or 13 sealing requirements, the unit must be mounted on a flat surface of an enclosure that meets the appropriate TYPE or NEMA rating, or an equivalent rating designed for the expected ambient conditions.
- Install the unit in a location that provides clear visual access to the control panel ON/OFF disconnect and is within wiring distance of both the incoming main lines and earth ground. Verify that the installation does not interfere with the free and unobstructed operation of the ON/OFF disconnect mechanism.
- For Standard Mounting, refer to the knockout pattern in the dimensional details provided.

WARNING

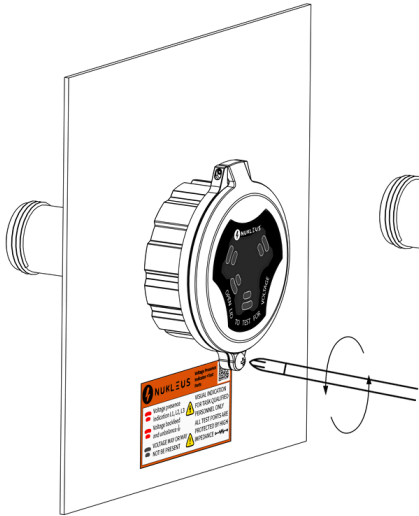
Exposure to certain chemicals may reduce the sealing effectiveness of the Nitrile NBR Door Gasket seal; therefore, periodic inspection is recommended, and the Door Gasket should be replaced if any signs of wear or degradation are found.

- If DC voltage is detected, stored energy is present. This energy must safely be de-energized before opening the enclosure or performing any electrical work.

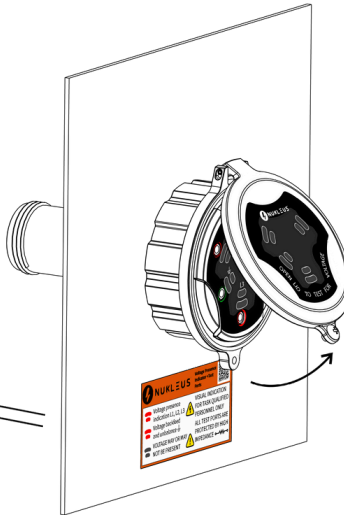
Dust Cap - Operation and Access

- The dust cap ensures the test ports are protected from dust and contaminants while maintaining LED visibility in harsh industrial environments.
- To test for voltage, open the dust cap by unscrewing the below screw.
- After the test is complete, close the dust cap and tighten the screw.
- To meet the environmental rating of the device, the dust cap must be closed and screw fully tightened.

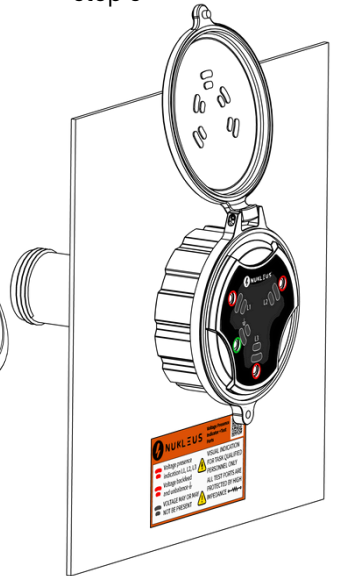
Step 1



Step 2



Step 3



- 1. Confirming Proper Function:** Before applying power, disconnect all equipment that could create a hazard and notify all personnel that the panel will be energized.
- 2. Power to be On:** Once normal voltage is applied, the L1, L2, and L3 indicator pairs will illuminate.
- 3. GND Indicator Operation:** For isolated Delta or 3-Phase Wye systems, it is normal for the GND indicator pairs to remain off unless a phase loss occurs, creating an unbalanced condition. This behavior is expected because when phase-to-phase voltages are balanced, no current flows to the ground path.

To ensure proper installation, first verify that the GND lead-wire is correctly grounded. Under normal operation, the power system determines whether the GND LEDs will illuminate.

Verification Steps:

1. Apply power to the VPI. If the GND LEDs do not illuminate, continue to Step 2.
2. Remove power and create an electrically safe work condition to disconnect one phase lead-wire from its source, either by removing the wire or pulling the fuse.
3. Reapply power and check that the GND LEDs illuminate, confirming a proper ground connection.
4. Remove power again, reconnect the phase lead-wire or fuse, then reapply power and verify that the L1, L2, and L3 LEDs illuminate, completing the installation.
5. Required Equipment: A digital voltmeter rated for at least 1000 VAC/1500 VDC with a 10M Ω minimum input impedance and CAT III & CAT IV safety ratings, along with insulated test probes that have 0.080" diameter tips.
6. Test Instrument Verification: Before starting any voltage testing, verify the voltmeter's category ratings, accuracy, and suitability for the application (AC & DC). Ensure the meter's functionality before and after test.
7. Voltage Measurement Procedure: Set the voltmeter to AC voltage (VAC) and confirm the test leads are connected to the proper AC input jacks. A qualified technician can then insert the test probe tips into:
 - Any two of the four terminal posts (L1, L2, L3, GND) for three-phase systems.
 - Any two of the three terminal posts (L1, N, GND) for single-phase systems.
8. Checking Normal Operating Conditions: To confirm that the system is powered correctly, measure AC voltage across:
 - Three-phase systems: L1-L2, L1-L3, L2-L3, L1-GND, L2-GND, and L3-GND.
 - Single-phase systems: L1-N, L1-GND, and N-GND.
9. Verifying Zero Energy State: Before performing maintenance or opening the system, ensure all feedback sources and stored energy are discharged.
 - With the meter still set to VAC, re-test the terminal combinations listed above to verify the circuits are completely de-energized.
 - Then switch the voltmeter to DC voltage (VDC) and repeat the same tests to confirm there is no stored DC energy present.
10. Training and Documentation: Ensure all facility personnel are properly trained in the safe use and limitations of this equipment. Update the "Point of Connections" on installation drawings to accurately reflect the final configuration and test results.

WARNING

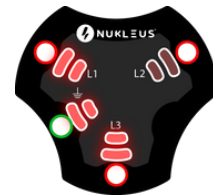
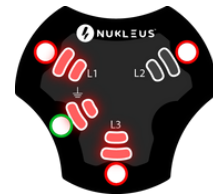
Ensure power is disconnected before starting any work on electrical systems. Adhere strictly to local installation codes and follow established safety and lockout/tagout procedures. Confirm zero electrical energy with the appropriate testing instrument to maintain a safe working environment.

With power removed, free dust and particles from the front of the label and dust cap with compressed air. Open the dust cap by unscrewing the cap screw and free the dust and particles on the inside of the cap and jack sockets with compressed air. Maintain a clean label by gently wiping with a clean damp cloth while power is removed and tighten the screw after the cleaning. Cleaning while powered is not recommended.

LED INDICATIONS

Below are the LED responses for Normal and Unbalanced system conditions:

Condition	LED Indication
Voltage Present	When voltage is present, the LEDs blink in their respective phases to indicate voltage presence.
Voltage unbalance	When voltage unbalance is detected, Ground LEDs will blink in addition to Phase LEDs.
Phase Loss	When a phase loss is detected, the corresponding phase LED goes off and the Ground LED starts blinking.



5-YEAR LIMITED WARRANTY

1. Warranty Coverage

Nukleus guarantees that its products will function as described and will be free from manufacturing defects for 4 years from the date of invoice from Nukleus (or) the authorized distributor, but not to exceed 5 years from the date of shipment from the factory whichever is earlier.

This warranty applies only when the product is installed and operated strictly in accordance with the Nukleus User Manual.

2. Firmware Coverage

Any firmware included with a Nukleus product is covered under the same 5-year warranty period, provided the product is installed and used correctly with reference to the user manual.

Nukleus does not guarantee that the firmware will run without interruptions or meet every user's specific requirement.

3. Replacement Promise

If a Nukleus product is found to have a confirmed manufacturing defect covered under this warranty, Nukleus will replace the product with the same model or an equivalent model. No repairs will be performed.

Nukleus may request that the defective unit be returned for inspection through the RMA (Return Material Authorization) process.

The replacement unit will be covered for the remaining duration of the original warranty period.

4. Third-Party Items Not Covered

This warranty does not apply to:

- Products or accessories manufactured by other brands
- Third-party software or firmware
- Any item not manufactured or supplied by Nukleus

All concerns related to such third-party items must be addressed directly with their respective manufacturers.

5. What Is Not Covered & Liability Limits

This warranty does not cover damage to the equipment, property, and any injuries to the personnel resulting from:

- Incorrect installation, wiring errors, or unsafe electrical practices
- Tampering, opening, modifying, or repairing by anyone not authorised by Nukleus
- Failure to follow the User Manual, installation instructions, or safety guidelines prescribed under the local and federal codes along with safe electrical work practices.
- Unsafe work methods, including bypassing safety features, incorrect testing procedures, or skipping LOTO requirements as outlined in NFPA 70E, Article 120.6.
- Rough handling, physical impact, or misuse of the product.
- Operating the product outside its rated electrical limits, environmental conditions and technical specifications.
- Unapproved physical hardware and firmware modifications or use of any external software.

Nukleus products are not designed, tested, or certified for use in medical equipment, life-support systems, emergency response devices, or any application where a product failure could directly impact personal safety or cause serious harm.

Customers are fully responsible for ensuring that Nukleus products are not deployed in high-risk environments where uninterrupted operation is essential to protect human life or mitigate hazardous conditions.

Nukleus is not responsible for any indirect or consequential losses, including:

- Loss of data
- Loss of revenue or profits
- Business downtime
- Any special, incidental, or consequential damages

Nukleus' liability is strictly limited to replacement of the defective product.

6. General Terms

This warranty applies only to genuine Nukleus products purchased from authorised partners. No dealer, installer, or employee is permitted to modify or extend this warranty.

Use of Nukleus products with modified systems or unapproved third-party equipment is done entirely at the user's own risk.