

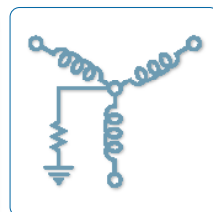
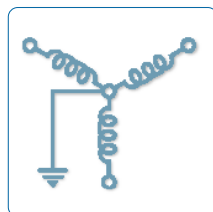
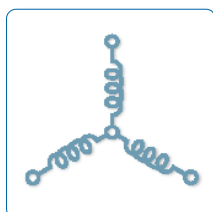
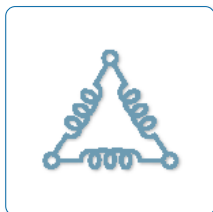


VTi

VOLTAGE INDICATOR +
VOLTAGE TEST PORT



Installation & Operation Manual



ABOUT I-GARD

I-Gard's commitment to electrical safety provides both industrial and commercial customers with the products needed to protect their electrical equipment and the people that operate them.

As the only electrical-safety focused company whose product portfolio includes neutral grounding resistors, high-resistance grounding systems and optical arc mitigation, we take pride in our technologies that reduce the frequency and impact of electrical hazards, such as arc flash and ground faults.

For those customers who have purchased from us over the last 30 years, you know us for the quality and robustness of our products, our focus on customer service and technical leadership. We build on this foundation by investing in developing new products in electrical safety education by actively participating in the IEEE community programs on technical and electrical safety standard, and working with local universities at discovering new technologies. We remain unrelenting in our goal of improving electrical safety in the workplace.

Our commitment to excellence is validated by long-standing relationships with industry leaders in fields as diverse as petroleum and gas, hospitals, automotive, data centers, food processing, aerospace, water and waste water plants, and telecommunications. We provide our customers with the product and application support required to ensure that their electrical distribution system is safe and reliable.

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1. GENERAL INFORMATION

This manual is intended for installation and maintenance of the VTi. Carefully read and make sure that you understand all instructions before you mount, connect, and configure the VTi.

The manual is available on:

<https://i-gard.com>

1.1 INTRODUCTION

VTi are permanently installed devices featuring LED-style indicators. These lights illuminate when hazardous voltage is detected in each phase and ground. They are designed to be a reliable tool for troubleshooting electrical systems, enabling users to measure voltage through high impedance test points without the need to open the panel door.

Important Safety Information:

For enhanced safety, NFPA 70E ANNEX O.2.4 (13) recommends the installation of high impedance protected test points. These points allow voltage measurement through the door, serving as an additional safety measure to reduce the risk associated with arc flash or electric shock hazards.

1.2 SAFETY NOTES

In this user manual, these symbols are used:



WARNING

General warning symbol indicates the presence of a hazard which could result in personal injury and damage to equipment or property.



WARNING

Warning symbol indicated the presence of hazardous voltage which could result in personal injury.



WARNING

Approved personnel are allowed to install and make the electrical connection of the Softstarter in accordance with existing laws and regulations.



INFORMATION

Information sign tells the reader important facts and conditions.

2. PRODUCT DESCRIPTION

2.1 COMPONENTS



Figure 2.1: VTi Components

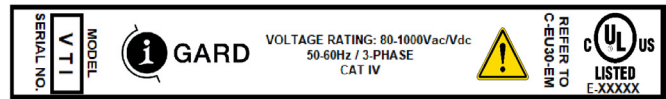


Figure 2.2: VTi Label

1. VTi Display Unit
2. Front rotary cover to access the test ports.
3. Lead Connections (4 wires) 8 Ft. length.

2.2 TECHNICAL SPECIFICATION

Operational AC Voltage Range	Voltage indicator: 80-1000 VAC, 50/60 Hz Test point: 0-1000 VAC
Operational DC Voltage Range	Voltage indicator: 80-1000 VDC, Test point: 0-1000 VDC
Operational Temperature Range	-20°C to +55°C
Storage Temperature Range	-40°C to +85°C
Wire Specifications	4 wire, 18 AWG, 8 Ft., PVC Insulated
Test Points	(4) test points jacks for L1, L2, L3 Phases and Ground(GND) finger safe
Indication LEDs	(8) indicating flashing LEDs
Installation	30.5mm standard knockout. Door Mounted
Enclosures NEMA Rating Type	NEMA 1, option for NEMA 4
Enclosures IP Rating	IP10, option for IP66
Internal Resistance	130 k Ω (Internal impedance protection affects voltage reading $\pm 3.6\%$)
Output Accuracy	3.2% of applied voltage with 10M Ω input impedance voltmeter connected to any (2) test points
Voltage category rating	CAT III @1000V AC, CAT IV @600V AC
Altitude of working	2000 m
Country of Origin	Canada

Table 2.2: Technical specification

2.3 CONFORMITY OF STANDARDS

UL 508	(Applicable to Voltage Indicator). Industrial Control Equipment
CSA C22.2 No. 14-13	(Applicable to Voltage Indicator). Industrial Control Equipment CAT IV 600V
UL 61010-1;2019 3rd Edition.	(Applicable to Voltage Indicator). Safety Requirements for electrical equipment for measurement, control and laboratory use - Part 1: General Requirements
UL 61010-2-030; 2018 2nd Edition.	(Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 2-030: Particular requirements for equipment having testing or measuring circuits)
EN 50581:2012	(Applicable to Voltage Test Station). Technical documentation for the assessment of electric and electronic products with respect to the Restriction of Hazardous Substances
EN 61010-1:2010	(Applicable to Voltage Test Station). Safety Requirements for electrical equipment for measurement, control and laboratory use - Part 1: General Requirements

Table 2.3: Conformity of standards.

3. INSTALLATION INSTRUCTIONS

This chapter provides instructions on the mounting and electrical connections that must be completed before the VTi can be used.



WARNING

Mounting and electrical connection of the units must be made by authorized personnel and in accordance with existing laws and regulations



WARNING

Make sure that supply voltage is switched off before mounting and connecting the VTi



WARNING

Always follow safety and lockout/tagout procedures when working on or near electrical systems and equipment.

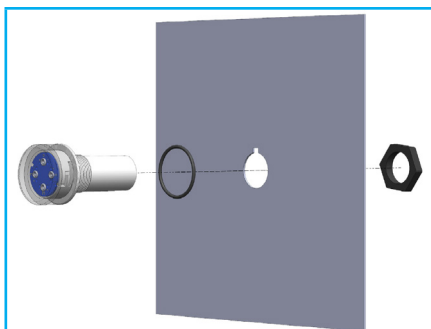
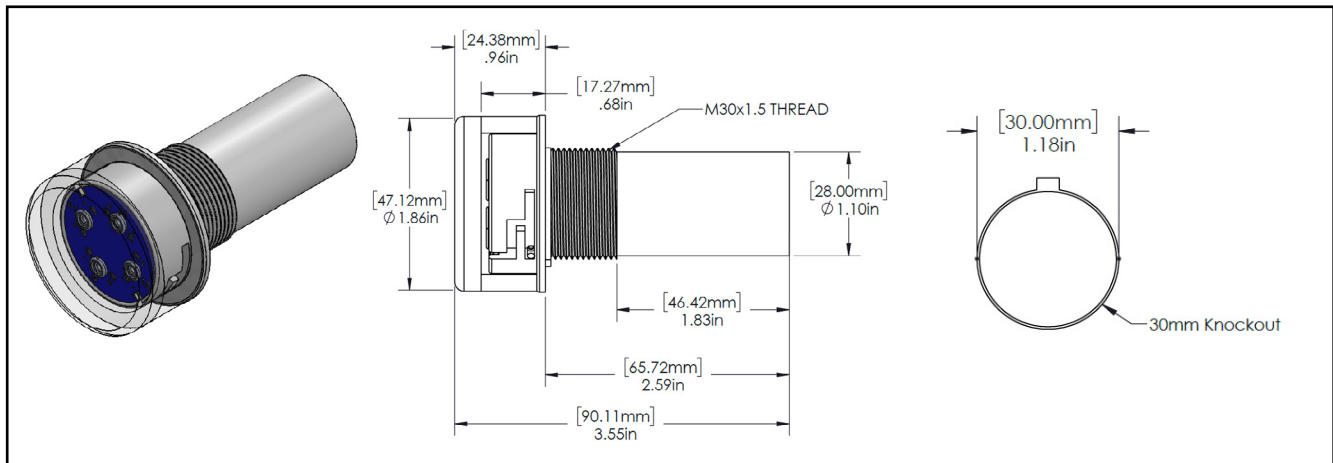


WARNING

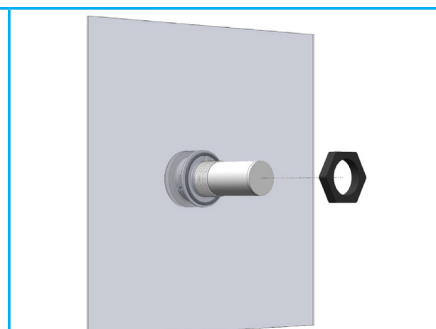
If this product is used in a manner not herein prescribed, the protection provided may be impaired.

3.1 MOUNTING VTi

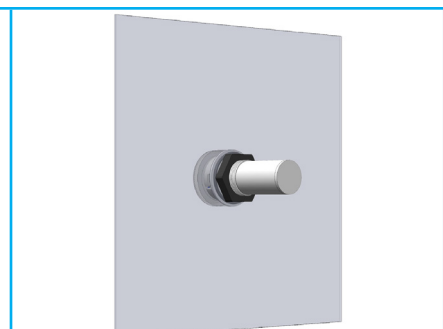
Dimensions



1. Insert the Indicator Module into the 30mm knockout hole with the O-Ring on the outside.

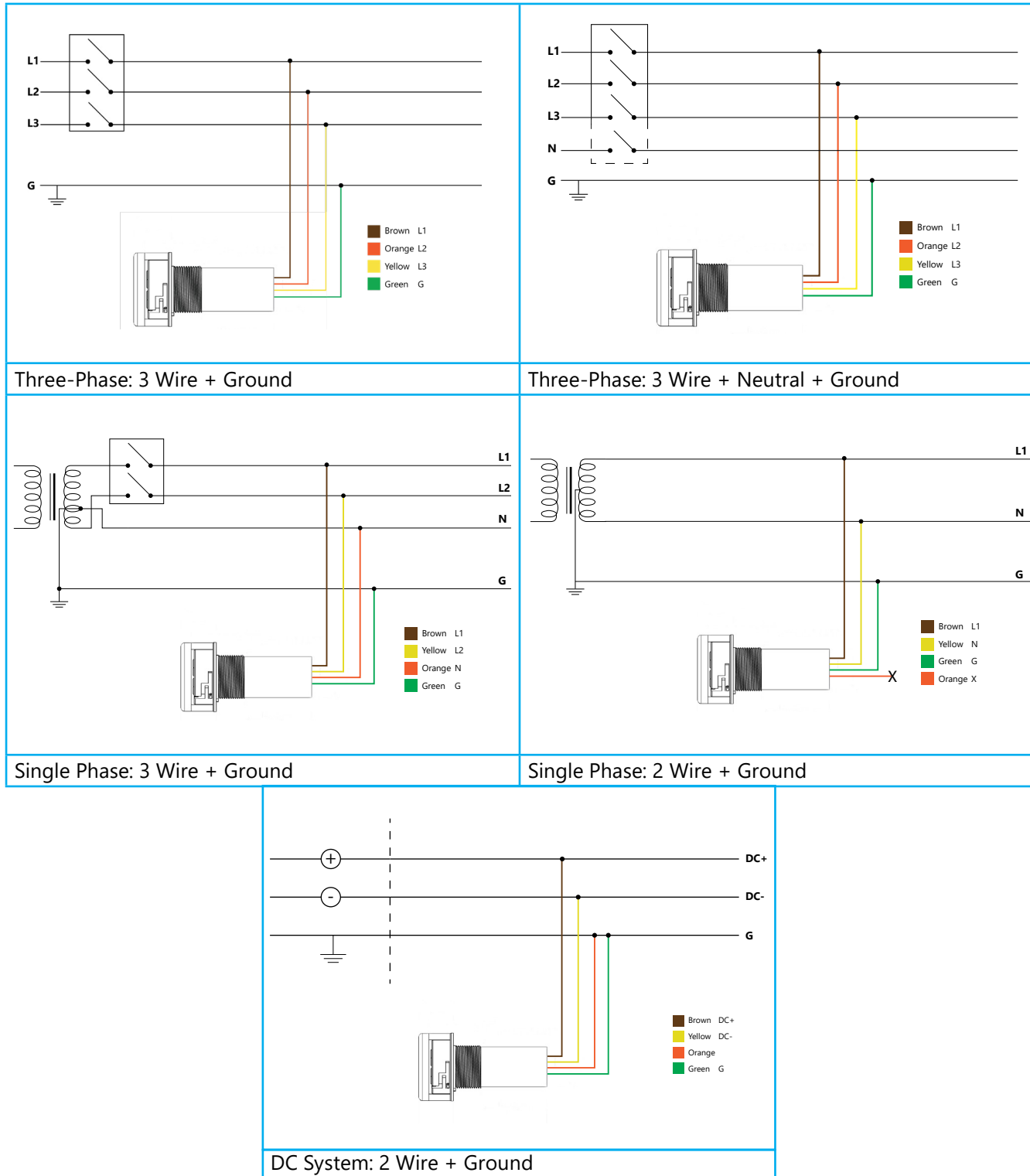


2. Install the panel nut.



3. Tighten the nut by hand until it and the washer fully contact the enclosure. Do not over-tighten.

3.2 CONNECTIONS



4. OPERATION INSTRUCTIONS

4.1 VISUAL CHECK AND LED INDICATIONS ON VTi

Perform a visual inspection. The four dual LEDs will illuminate in the following ways to indicate different conditions:

AC VOLTAGES				
Condition	L1	L2	L3	G
Normal 3 Phase Connection	 Flashing Red	 Flashing Red	 Flashing Red	 Off
Phase to Ground Leakage	 Flashing Red	 Flashing Red	 Flashing Red	 Flashing Red
Phase Loss (Example: L2 Fails)	 Flashing Red	 Off	 Flashing Red	 Flashing Red
Phase Unbalance	 Flashing Red	 Flashing Red	 Flashing Red	 Flashing Red
Single Phase Connection	 Flashing Red	 Off	 Flashing Red	 Off

Table 4.1: AC Voltages

DC VOLTAGES				
Condition	L1	L2	L3	G
If DC Voltage is connected +ve to L1 and -ve to L3	 Flashing Red	 Off	 Flashing Red	 Off

Table 4.2: DC Voltages

4.2 VOLTAGE MEASUREMENT AND TROUBLESHOOTING

The VTi works with a digital multimeter to measure voltage, making it a valuable tool for troubleshooting electrical motors. It provides key electrical information to diagnose power supply issues and identify faults affecting motor performance. With VTi, user can address common motor problems like: Overheated motors, Burnt-out motors, Failure to start, Motor Stopped.

INFORMATION



Use digital voltmeter with 1000V AC or 1000V DC rated input minimum, 10M Ω input impedance and CAT III & IV. A pair of insulated test probes with .080" DIA. points

Measuring Voltage Using a Multimeter

- I. Before and after testing, verify the multimeter's accuracy using a known AC or DC voltage source.
- II. Turn the multimeter dial to the VAC (AC Voltage) or VDC depending on the system voltage.
- III. Insert the multimeter probes into any two of the four terminal ports: L1, L2, L3, G and Measure the voltage between the selected points.



NOTES

Lined area for notes, consisting of multiple horizontal lines.



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