MAXIVOLT
TRANSIENT VOLTAGE SOLUTIONS

GUARDDOG® SERIES
HANDBOOK

Increase Production
Reduce Downtime

TABLE OF **CONTENTS**

FEATURES & SPECIFICATIONS

- Made In The USA & BABA Compliant
- **Listing:** ANSI/UL 1449-4
- **Enclosure:** NEMA® Type 4X, Polycarbonate
- **Filtering:** UL 1283
- **Operating Temperature:** -40° C to 85° C
- **Operating Humidity:** 1% to 95%
- **EMI-RFI Noise Attenuation:** < 40 dB
- **Capacitance:** 1.5 µF / Line
- **Lights:** Blue LEDs On / Red LEDs Off
- **Frequency Range:** 50-400 Hz
- **Component Response Time:** <1 ns
- **Conductor:** #12 AWG Stranded
- **Fusing:** Individually Fused Components
- **UL & IEC Type:** 2
- **SCCR:** 100 kA

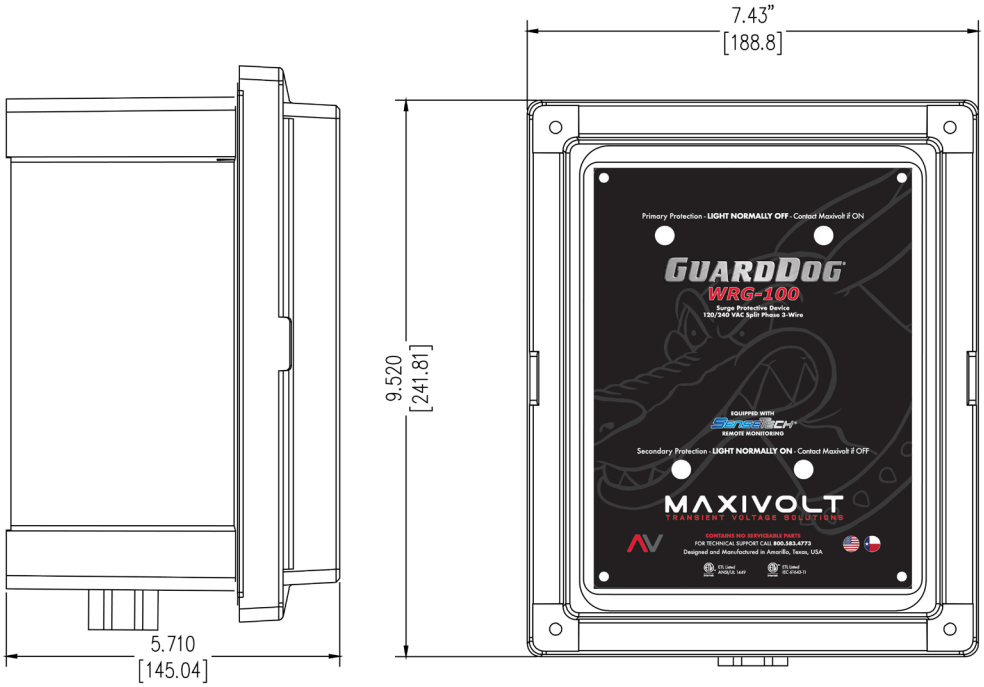
Model	Voltage	Configuration	Modes of Protection	Clamp Voltage* L-N (L-L) [Hi-Leg]	VPL [Up] L-N (L-L)	MCOV L-N (L-L) [Hi-Leg]
WRG-100	120/240 VAC	Split Ø / 3 Wire	L-N, L-L	220 (440)	500 (960)	140 (280)
WRG-200	120/208 VAC	3 Ø / 4 Wire	L-N, L-L	220 (440)	500 (960)	140 (280)
WRG-200N	120/240 VAC	3 Ø / 4 Wire [Hi-Leg]	L-N, L-L	220 (440) [510]	500 (960) [900]	140 (280) [300]
WRG-300	230/415 VAC	3 Ø / 4 Wire	L-N, L-L	510 (1020)	900 (1600)	300 (600)
WRG-400	277/480 VAC	3 Ø / 4 Wire	L-N, L-L	510 (1020)	900 (1600)	300 (600)
WRG-400P	480 VAC	3 Ø / 3 Wire	L-L	1020	1600	600
WRG-600	347/600 VAC	3 Ø / 4 Wire	L-N, L-L	670 (1340)	1130 (2000)	385 (770)
WRG-700P	690 VAC	3 Ø / 3 Wire	L-L	1362	2400	840

*A testing metric that attempts to identify the voltage at which an SPD begins significant conduction. Clamping voltage is not a fixed limit, varying with current, waveform, and system conditions.

DIMENSIONAL **DRAWINGS**

WRG-100
WRG-200
WRG-200N
WRG-300

WRG-400
WRG-400P
WRG-600
WRG-700P



inches
[mm]

IMPORTANT **NOTES**

DANGER: HAZARDOUS VOLTAGE

- Contact with energized conductors may result in death or serious injury.
- To avoid injury:
  - De-energize all power sources before installation.
  - Follow applicable Lockout/Tagout (LOTO) procedures.
  - Verify absence of voltage using an appropriately rated voltmeter before touching conductors.
  - Ensure the disconnecting means is in the OFF position before installation.
  - Never install the SPD on energized circuits.

WARNING: CONDUCTOR DAMAGE HAZARD

- Improper conduit selection may damage conductors and create an electrical shock hazard.
- To avoid injury:
  - Route all SPD conductors in rigid conduit.
  - Do not use flexible conduit.
  - Inspect conductors for damage prior to energization.
  - Do not energize if conductors are damaged.

CAUTION: EQUIPMENT DAMAGE HAZARD

- Improper wiring, conductor routing, or modification may damage the SPD and void the warranty.
- Do Not:
  - Connect two SPD conductors to the same phase.
  - Add wire to SPD lead conductors.
  - Modify, alter, or disassemble the SPD.
- Improper installation may result in reduced protection performance, equipment damage, or loss of surge protection.

NOTICE: INSTALLATION REQUIREMENTS

- Approximately 36 inches (914 mm) of conductor is provided for installation.
- Trim conductors as short as practical without placing strain on the conductors.
- Avoid sharp bends in conductors.
- Route conductors using the shortest practical path.
- Excess conductor length and sharp bends increase impedance and compromise SPD performance.

INSTALLATION INSTRUCTIONS

DANGER: ELECTRICAL SHOCK / ARC FLASH HAZARD

- Failure to de-energize equipment can result in serious injury or death.
- Verify absence of voltage using properly rated test equipment.
- Installation must be performed by a qualified electrician only.

WARNING: EQUIPMENT DAMAGE / SAFETY RISK

- Do NOT install with power present.
- Do NOT extend factory-provided conductors.
- Do NOT nick, cut, or damage conductor insulation.
- Improper installation may result in equipment failure, fire, or hazardous conditions.

CAUTION: PERFORMANCE & RELIABILITY

- Keep conductor length as short as possible.
- Avoid sharp bends to prevent added impedance.
- Use rigid conduit only (no flex conduit).

NOTICE: INSTALLATION BEST PRACTICES

- Mount as close as possible to connection points.
- Ensure proper conduit routing before securing the unit.
- "P" models are suitable for installation on 3-phase electrical systems, including:
  - Delta systems
  - High-Resistance Grounded (HRG) systems

INSTALLATION STEPS

1. READ IMPORTANT NOTES BEFORE INSTALLING

2. De-energize System

- Disconnect all power sources.
- Verify zero voltage prior to installation.

3. Select Mounting Location

- Locate SPD near connection points based on conduit entry.
- Install with enclosure hinge at the bottom for safe access and service.
- Ensure conductors will reach without extension.
- Minimize lead length to maintain performance.

INSTALLATION **INSTRUCTIONS**

4. Mount the SPD

- Secure using provided mounting feet.
- Mounting feet may be oriented vertically or horizontally.

5. Install Conduit

- Use 3/4" weatherproof rigid conduit with a pull elbow.
- Route conduit from SPD to panel.

6. Route Conductors

- Carefully pull conductors through conduit into panel.
- Protect insulation from damage during routing.

7. Trim and Prepare Conductors

- Cut conductors to shortest practical length.
- Leave minimal slack to avoid strain or sharp bends.
- Strip insulation only as required for termination.
- Do not leave exposed conductor.

8. Make Electrical Connections

- Connect SPD conductors according to the wiring diagrams and example installations shown on pages 8–16.

9. Verify Installation

- Confirm all of the following:
  - Connections are secure.
  - Insulation is intact.
  - Conduit and fittings are properly installed.
  - Verify all wire connections are tight.

INSTALLATION **INSTRUCTIONS**

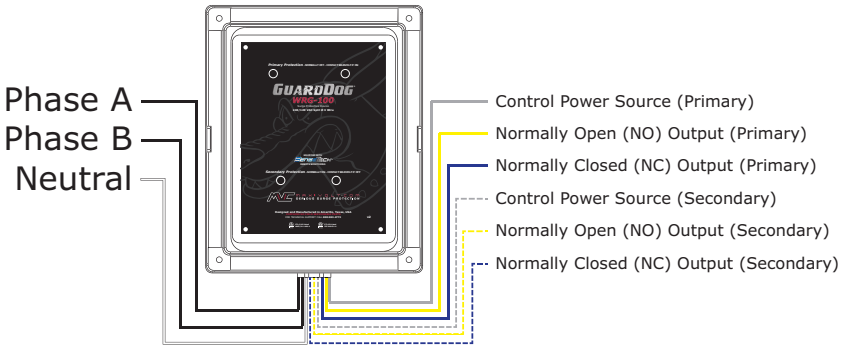
WARNING: ENERGIZATION RISK

- Re-check all connections before applying power.
- Improper installation may result in catastrophic failure upon energization.

10. Energize System

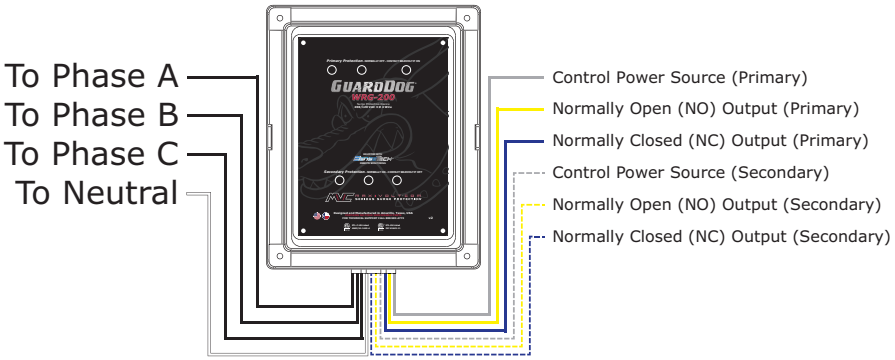
- Restore power only after all steps and safety checks are complete.
- After installation:
  - Secondary Protection:
    1. Blue indicator lights should be ON.
    2. Secondary NO contact should be open.
    3. Secondary NC contact should be closed.
  - Primary Protection:
    1. Red indicator lights should be OFF.
    2. Primary NO contact should be open.
    3. Primary NC contact should be closed.
- After energization:
  - Verify that all secondary blue indicators are ON.
  - Verify that all primary red indicators are OFF.
  - Verify that the connected PLC, BMS, SCADA system, or alarm circuit displays the normal operating condition.
  - Confirm the normal contact states: the primary and secondary NO contacts are closed to their respective common/source conductors, and the NC contacts are open.
  - Test the remote alarm path using the connected controller's approved test function or another Maxivolt-approved procedure. Do not open or modify the SPD or disturb conductors while energized.
  - If any indicator or monitoring state differs from the conditions above, de-energize the installation in accordance with applicable lockout/tagout procedures and contact Maxivolt.

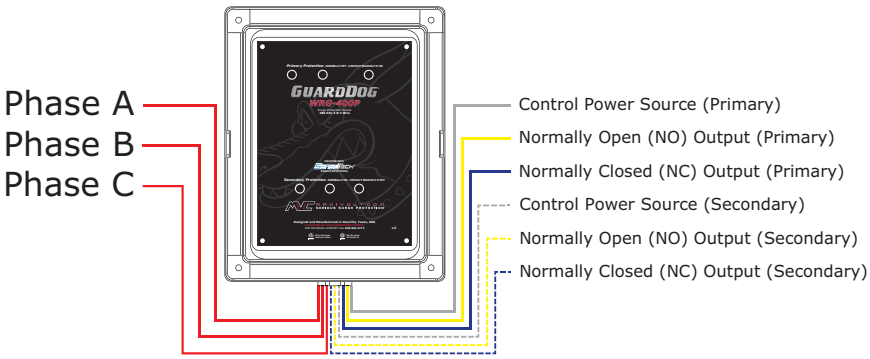
WIRING DIAGRAMS



WRG-100

WRG-200 WRG-300
WRG-400 WRG-600

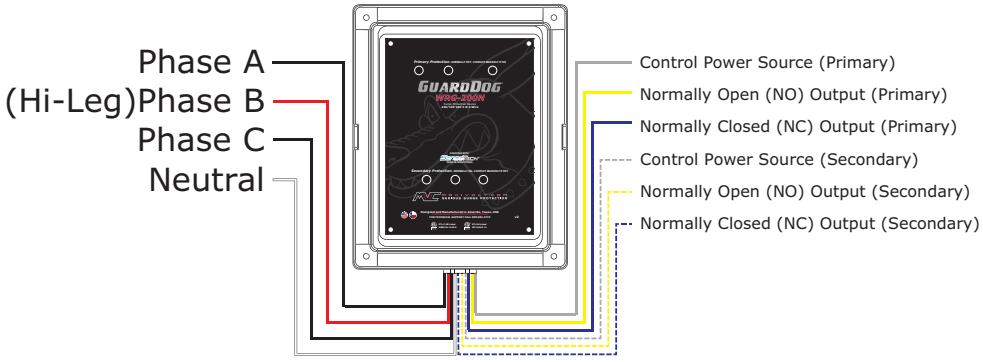




WRG-400P
WRG-700P

WRG-200N

Note: WRG-200N only: Connect the designated Phase B/high-leg conductor to the system high leg. Before connection, identify and mark the high leg in accordance with applicable electrical codes and verify that it measures approximately 208 VAC to neutral on a nominal 120/240 VAC, three-phase, four-wire high-leg delta system.



EXAMPLE INSTALLATIONS

UNDERSTANDING EXAMPLE INSTALLATIONS

The following example installation diagrams illustrate common methods for integrating the GuardDog® Series remote monitoring contacts into a PLC, SCADA system, alarm circuit, or local indication system.

Before reviewing the examples, it is important to understand the meaning of each legend item and how the monitoring contacts behave during normal operation and protection circuit status changes.

HOW TO READ THE EXAMPLES

Each example installation illustrates the same three operating conditions:

1. Normal Operating Condition
2. Primary Expended – Secondary Operating
3. Primary Expended – Secondary Expended

By comparing the contact states and PLC or indicator responses in each example, users can determine how to integrate the GuardDog® Series into their preferred monitoring platform while maintaining clear visibility of protection system status.

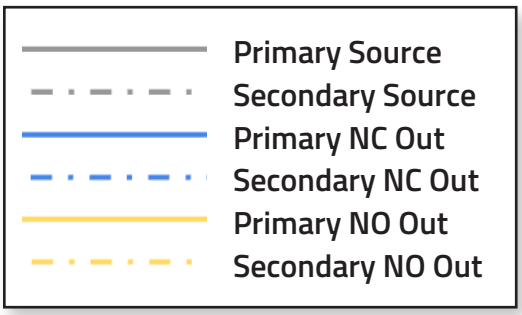
LEGEND EXPLANATION

- Primary Source:
  The external control power supplied to the Primary Protection monitoring circuit.

- Secondary Source:
  The external control power supplied to the Secondary Protection monitoring circuit.

- Primary NO Out (Normally Open Output):
  A contact that closes during normal operation of the Primary Protection circuit. This output is commonly used to indicate that the Primary Protection circuit is operating normally.

- Primary NC Out (Normally Closed Output):
  A contact that closes when the Primary Protection circuit has expended or lost power. This output is commonly used to generate an alarm or fault indication.



- Secondary NO Out (Normally Open Output):
  A contact that closes during normal operation of the Secondary Protection circuit. This output is commonly used to indicate that the Secondary Protection circuit is operating normally.

- Secondary NC Out (Normally Closed Output):
  A contact that closes when the Secondary Protection circuit has expended/lost power. This output is commonly used to generate an alarm or fault indication.

EXAMPLE INSTALLATIONS

OPERATING CONDITIONS SHOWN IN THE EXAMPLES

The Maxivolt WRG Series is a dual-layer surge protective device (SPD) with primary and secondary protection circuits for redundancy. It includes SenseTech® Form-C dry contacts (one set for each protection layer) providing isolated, potential-free signals for remote monitoring (e.g., to a PLC, BMS, SCADA, or alarm system). These contacts do not supply power — you must provide your own low-voltage source (5 to 120 volts).

Normal Operating Condition

This condition indicates the device is providing both levels of protection and no action is required.

- In a normal operating condition:
  - Primary Protection is healthy.
  - Secondary Protection is healthy.
  - Primary red indicator lights are OFF.
  - Secondary blue indicator lights are ON.
  - Primary NO contact is closed.
  - Primary NC contact is open.
  - Secondary NO contact is closed.
  - Secondary NC contact is open.

Primary Expended – Secondary Operating

This condition provides an early warning that the Primary Protection circuit has operated and service should be scheduled, while the Secondary Protection circuit continues to provide protection.

- In this condition:
  - The Primary Protection circuit has expended.
  - The Secondary Protection circuit remains operational.
  - Primary red indicator lights are ON.
  - Secondary blue indicator lights remain ON.
  - Primary NO contact opens.
  - Primary NC contact closes.
  - Secondary NO contact remains closed.
  - Secondary NC contact remains open.

Primary Expended – Secondary Expended

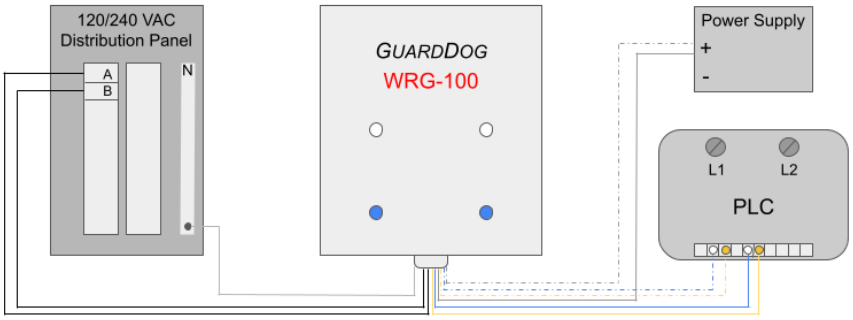
This condition indicates the GuardDog® Series device has reached the end of its protective capability and Maxivolt should be contacted for assistance.

- In this condition:
  - Both protection circuits have expended.
  - Primary red indicator lights are ON.
  - Secondary blue indicator lights are OFF.
  - Primary NO contact is open.
  - Primary NC contact is closed.
  - Secondary NO contact is open.
  - Secondary NC contact is closed.

EXAMPLE **INSTALLATIONS**

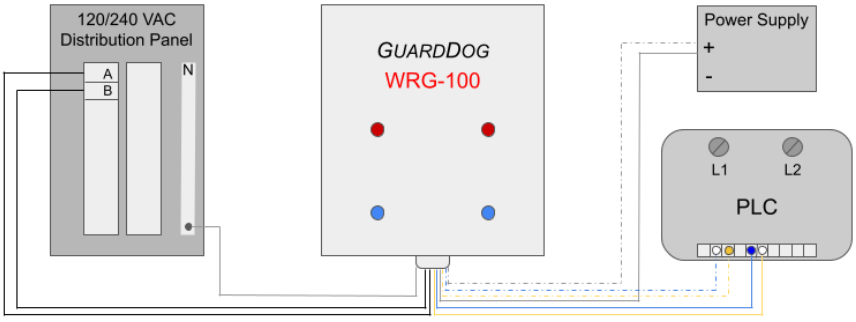
Wiring Diagram: WRG-100

Normal Operating Condition



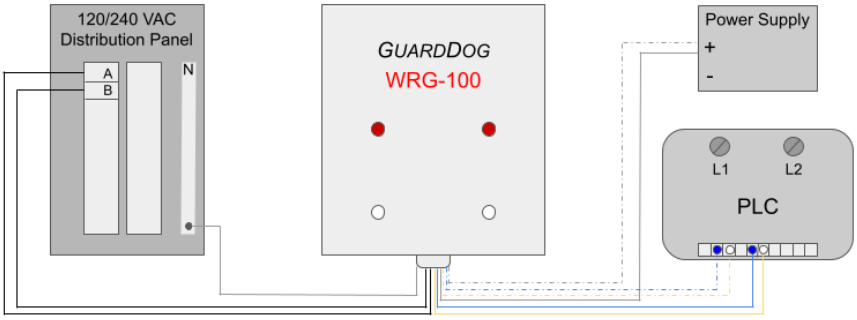
Wiring Diagram: WRG-100

Primary Expended
Secondary Operating



Wiring Diagram: WRG-100

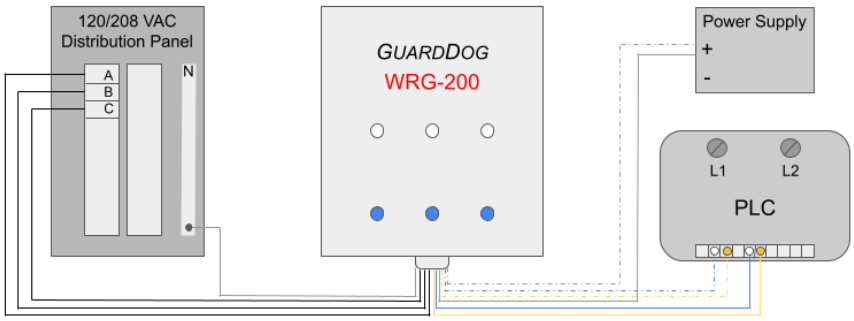
Primary Expended
Secondary Expended



EXAMPLE **INSTALLATIONS**

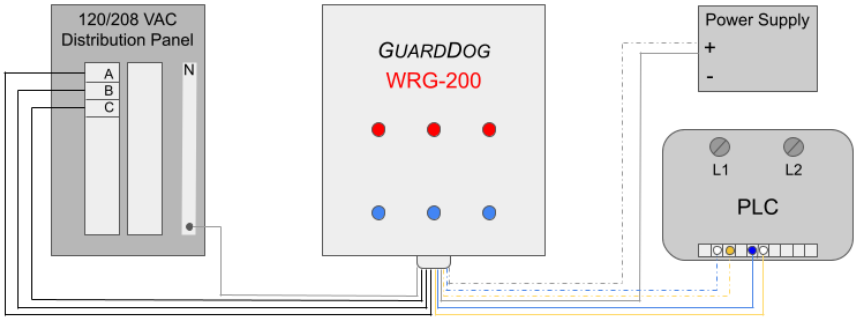
Wiring Diagram: WRG-200

Normal Operating Condition



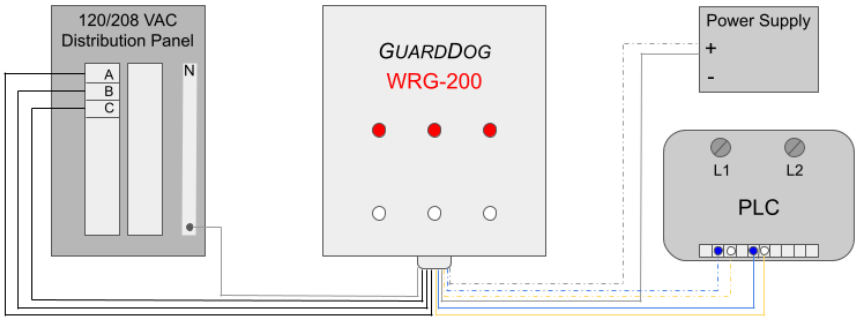
Wiring Diagram: WRG-200

Primary Expended
Secondary Operating



Wiring Diagram: WRG-200

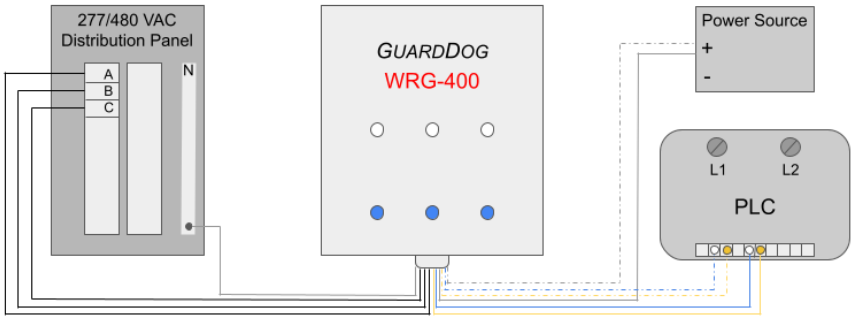
Primary Expended
Secondary Expended



EXAMPLE **INSTALLATIONS**

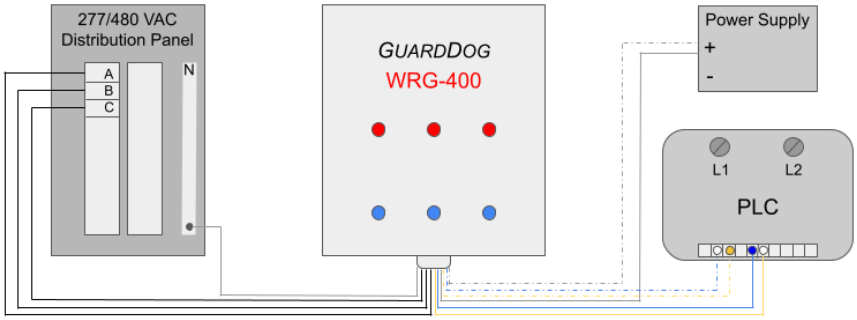
Wiring Diagram: WRG-400

Normal Operating Condition



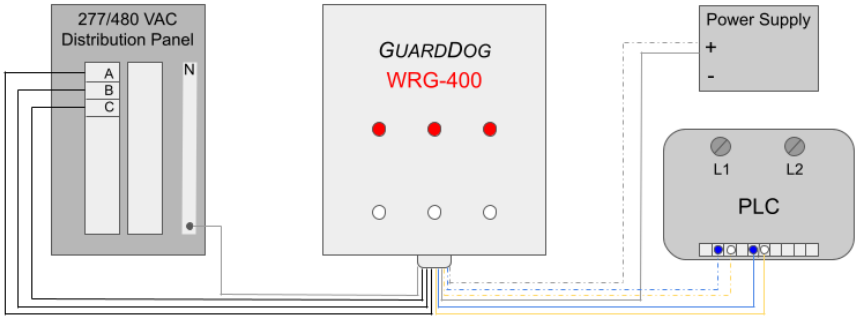
Wiring Diagram: WRG-400

Primary Expended
Secondary Operating



Wiring Diagram: WRG-400

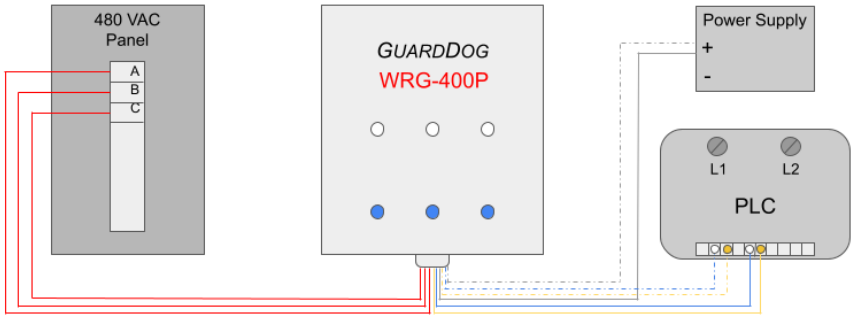
Primary Expended
Secondary Expended



EXAMPLE **INSTALLATIONS**

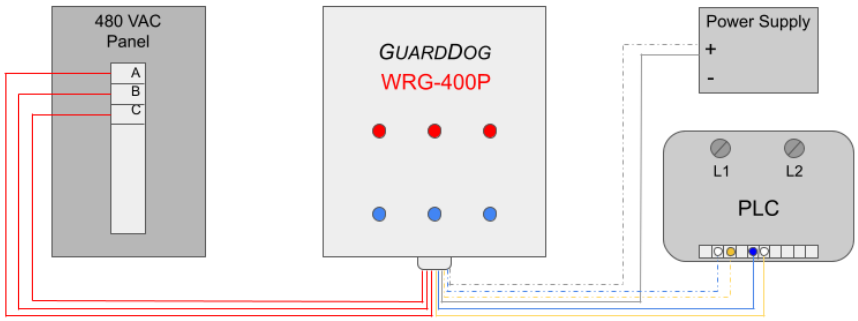
Wiring Diagram: WRG-400P

Normal Operating Condition



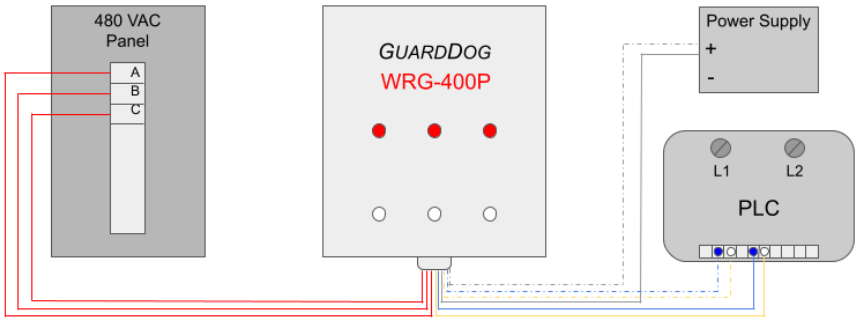
Wiring Diagram: WRG-400P

Primary Expended
Secondary Operating



Wiring Diagram: WRG-400P

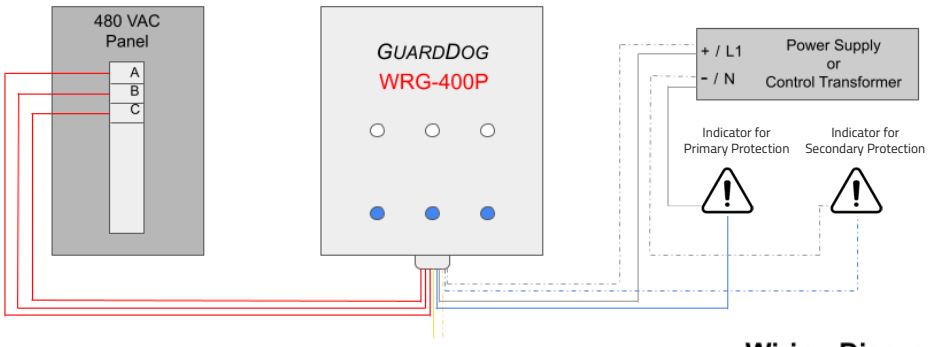
Primary Expended
Secondary Expended



EXAMPLE **INSTALLATIONS**

Wiring Diagram: WRG-400P

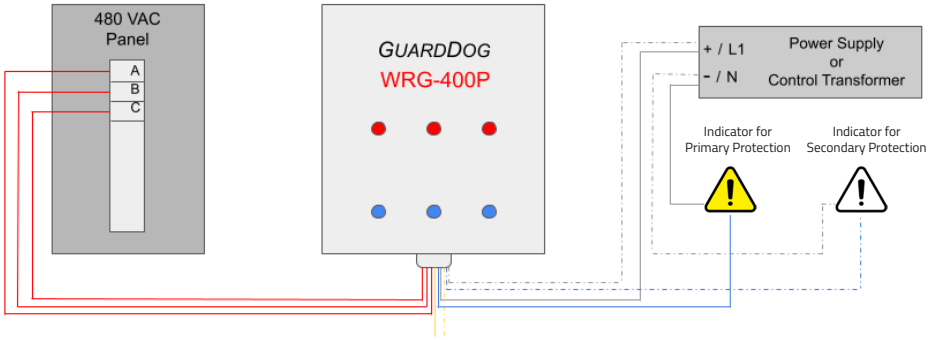
Normal Operating Condition



Wiring examples using N.C. contacts to operate a visual or audible indicator.

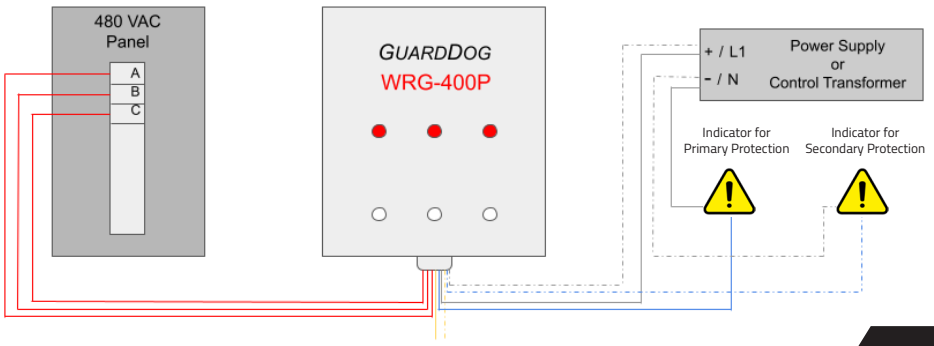
Wiring Diagram: WRG-400P

Primary Expended
Secondary Operating



Wiring Diagram: WRG-400P

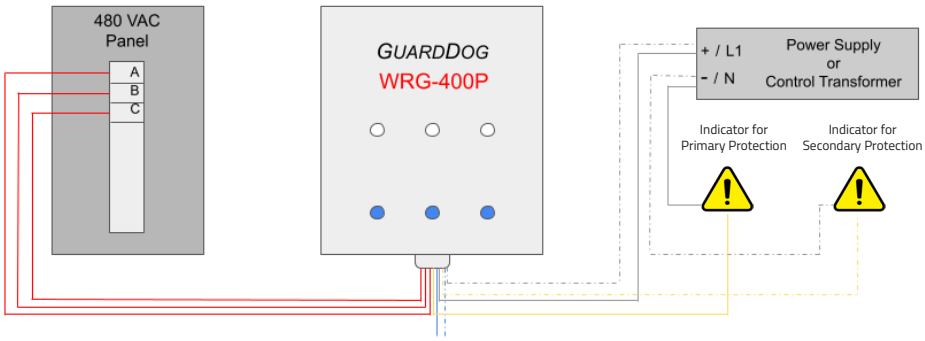
Primary Expended
Secondary Expended



EXAMPLE **INSTALLATIONS**

Wiring Diagram: WRG-400P

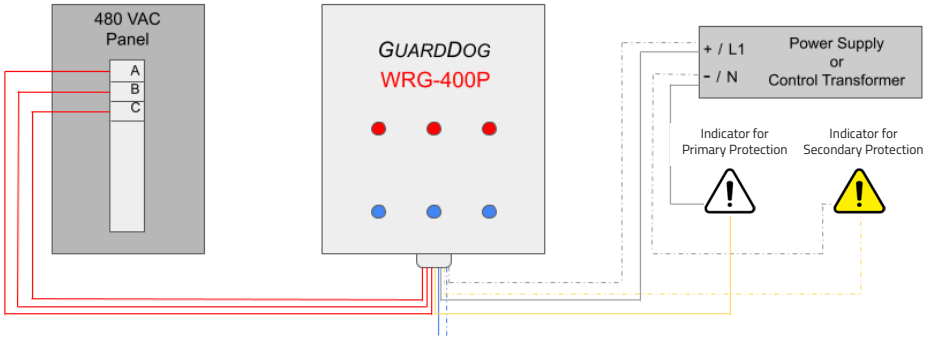
Normal Operating Condition



Wiring examples using NC contacts to operate a visual or audible indicator.

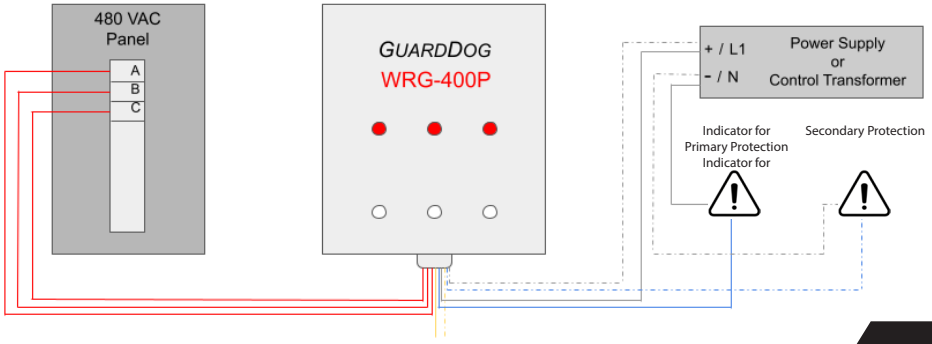
Wiring Diagram: WRG-400P

Primary Expended
Secondary Operating



Wiring Diagram: WRG-400P

Primary Expended
Secondary Expended



OPERATION & MAINTENANCE

WARNING: ELECTRICAL SHOCK HAZARD

- This device contains no field-serviceable parts.
- Opening, disassembling, or attempting to repair this device may result in equipment damage, loss of protection, or exposure to hazardous voltage.
- To avoid injury and equipment damage:
  - Do not open the enclosure.
  - Do not modify or repair the device.
  - Contact Maxivolt for technical assistance if abnormal operation is observed.

CAUTION: INSPECTION ACCURACY

Failure to properly identify fuse status may lead to undetected system vulnerability.

VISUAL INSPECTION

Primary Protection Status

- Means of Indication:
  - Primary protection indicator lights are red.
  - Under normal operating conditions, all red indicator lights are OFF.
- Inspection Action:
  - Visually verify that all red indicator lights are OFF.
  - If any red indicator light is ON, contact Maxivolt for assistance.

Secondary Protection Status

- Means of Indication
  - Secondary protection indicator lights are blue.
  - Under normal operating conditions, all blue indicator lights are ON.
- Inspection Action
  - Visually verify that all blue indicator lights are ON.
  - If any blue indicator light is OFF, contact Maxivolt for assistance.

WARRANTY

One Year Limited Warranty

Maxi-Volt Corporation, Inc. (Maxivolt)warrants to the original consumer purchaser that the electrical component parts of this WRG-Series Unit are free from defects in material and workmanship at the time of purchase under normal use and conditions. The term of this warranty begins on the purchase date and continues for a period of one year.

In the event of a defect, or other failure of the WRG Series Unit not caused by any misuse or damage to the WRG Series Unit while in the possession of the consumer, Maxivolt will repair or replace the WRG Series Unit with a new or re-manufactured equivalent, or, at Maxivolt's option, refund the purchase price. However, Maxivolt will not elect refund unless it is unable to provide replacement, and repair is not commercially practicable or cannot be made within a commercially reasonable time.

THE CONSUMER IS LIMITED TO THE REPAIR OR REPLACEMENT OF THE DEFECTIVE WRG SERIES UNIT OR REFUND OF THE PURCHASE PRICE. THIS LIMITED WARRANTY REPRESENTS THE TOTAL LIABILITY OF MAXIVOLT FOR ANY WARRANTED PART. MAXIVOLT DISCLAIMS ANY OTHER EXPRESS OR IMPLIED WARRANTIES INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. MAXIVOLT, INC. SHALL NOT BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.

SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPIIED WARRANTY LASTS, OR THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER LEGAL RIGHTS, WHICH MAY VARY FROM STATE TO STATE.

This warranty does not cover: (1) installation, set-up, testing, or adjustment; (2) removal or re-installation; (3) defects occurring after purchase due to improper installation, repair, modification, accident, tampering, misuse, abuse, or negligence; or (4) damage to the unit from fire, flood, or other catastrophe. This warranty is void if the rated capacity of the WRG Series Unit is exceeded, has been opened or disassembled in any manner, or the serial number of the WRG Series Unit has been altered or removed. This warranty extends exclusively to the original purchaser of the WRG Series Unit, and subsequent purchasers are not covered by this warranty agreement.

WARRANTY PROCEDURE

To obtain warranty performance, the consumer must deliver to Maxivolt: (1) the defective WRG Series Unit; (2) a receipt, bill of sale, or other original evidence showing the date of purchase; and (3) the consumer's return address and daytime telephone number. If shipped, the WRG Series Unit must be packaged so that it is protected from possible shipping damage, and should be addressed to: Maxivolt, 9350 S. Georgia St. Amarillo, TX 79118, attention Warranty Claim. To obtain information on warranty performance, call toll free: 1-800-583-4773. A Warranty Information Form should be filled out and included in the package containing the WRG Series Unit. This form can be requested from Maxivolt at the toll free number listed above or via e-mail at info@maxivolt.com.

Register your MAXIVOLT product at:
www.maxivolt.com/home/warranty

ABOUT

Maxivolt delivers reliable solutions for our clients' highest priorities. Prioritizing safety and efficiency, we engineer comprehensive mitigation systems to extend equipment lifespan, minimize downtime, and produce a measurable return on investment. We aren't conformists, but instead advocate for the best possible outcomes for end-users.

For more information, contact Maxivolt:

800-583-4773

info@maxivolt.com

MAXIVOLT
TRANSIENT VOLTAGE SOLUTIONS