MAXIVOLT
TRANSIENT VOLTAGE SOLUTIONS

WS SERIES
HANDBOOK

Increase Production
Reduce Downtime

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FEATURES & **SPECIFICATIONS**

- Made In The USA & BABA Compliant
- 1 Year Warranty
- Patented Technology (No. 6,069,781)
- NEMA® 4X Rated Enclosure
- Ultra-Durable Catalyzed Painted Enclosure
- Individually Fused Components
- Hybrid Surge Suppression Circuit
- Non-Ground Dependent
- Tailored for Medium Voltage Equipment Protection
- Custom Built to Voltage Application

Model	WS-1500	WS-2500	WS-3600	WS-5KV
Voltage	1500 VAC	2500 VAC	3600 VAC	4160 VAC
Clamp Voltage*	3400 VAC	5800 VAC	8400 VAC	9600 VAC
MCOV	2115 VAC	3525 VAC	5076 VAC	5866 VAC
Configuration	3 Ø / 3 Wire	3 Ø / 3 Wire	3 Ø / 3 Wire	3 Ø / 3 Wire
Fuse Indication	Mechanical Striker Pin	Mechanical Striker Pin	Mechanical Striker Pin	Mechanical Striker Pin
Conductor	40KV 12 AWG Stranded	40KV 12 AWG Stranded	40KV 12 AWG Stranded	40KV 12 AWG Stranded
Enclosure	NEMA® Type 4X	NEMA® Type 4X	NEMA® Type 4X	NEMA® Type 4X
Environmental	RoHS	RoHS	RoHS	RoHS
Modes of Protection	L-L	L-L	L-L	L-L
SCCR	63 kA	63 kA	63 kA	63 kA
Operating Temperature	-40° C to 85° C	-40° C to 85° C	-40° C to 85° C	-40° C to 85° C
Operating Humidity	1% to 95%	1% to 95%	1% to 95%	1% to 95%
EMI-RFI Noise Attenuation	Yes	Yes	Yes	Yes
Capacitance	4.8 nF	4.2 nF	3.6 nF	3.2 nF
Component Response Time	<25 ns	<25 ns	<25 ns	<25 ns
Range Frequency	50 - 400 HZ	50 - 400 HZ	50 - 400 HZ	50 - 400 HZ

*A testing metric that estimates the voltage at which a surge protective device begins significant conduction. Clamping voltage is not a fixed limit, varying with current, waveform, and system conditions.

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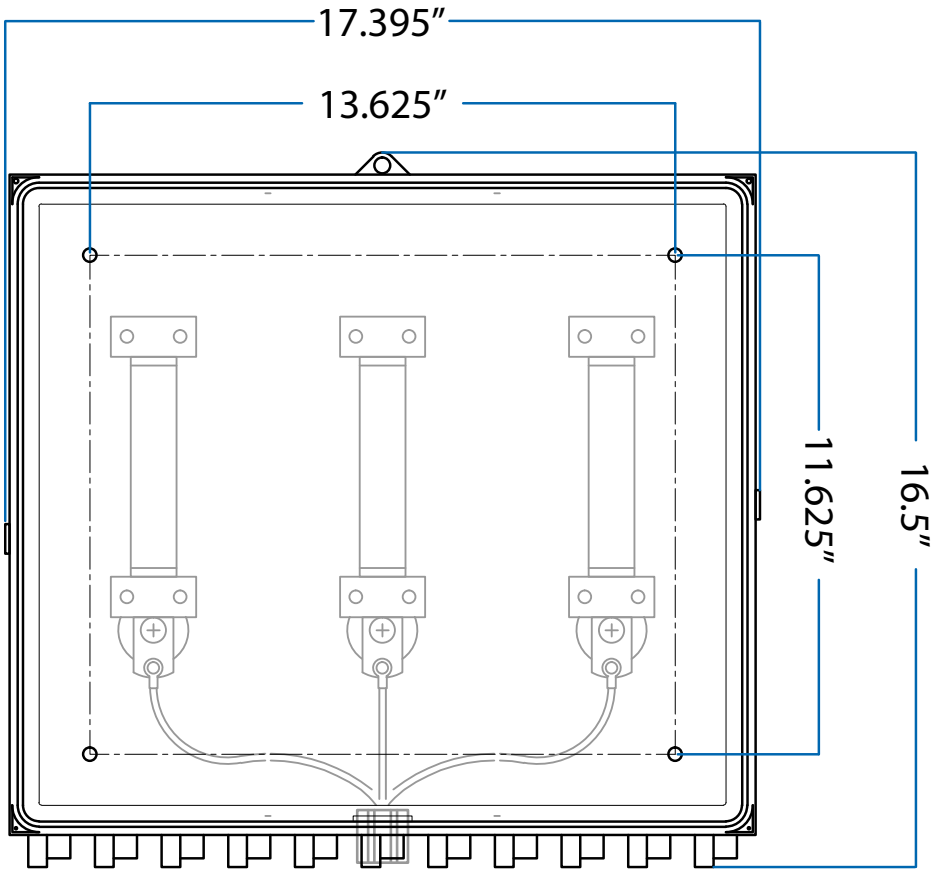
DIMENSIONAL **DRAWINGS**



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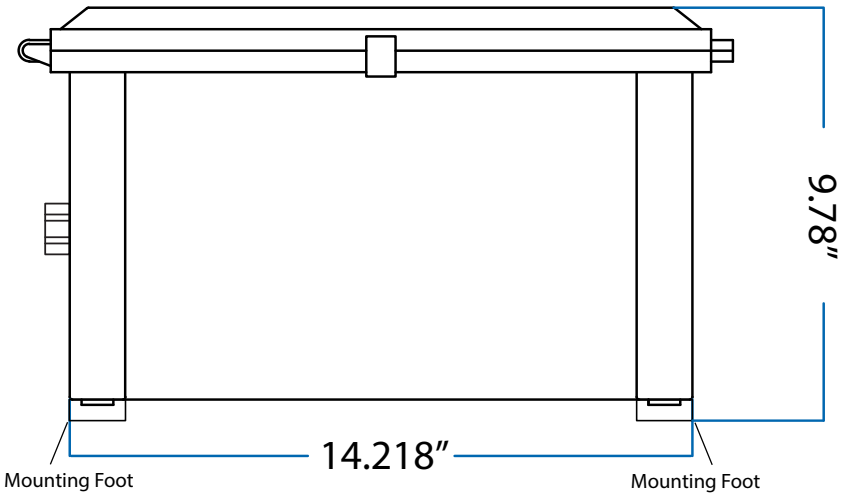
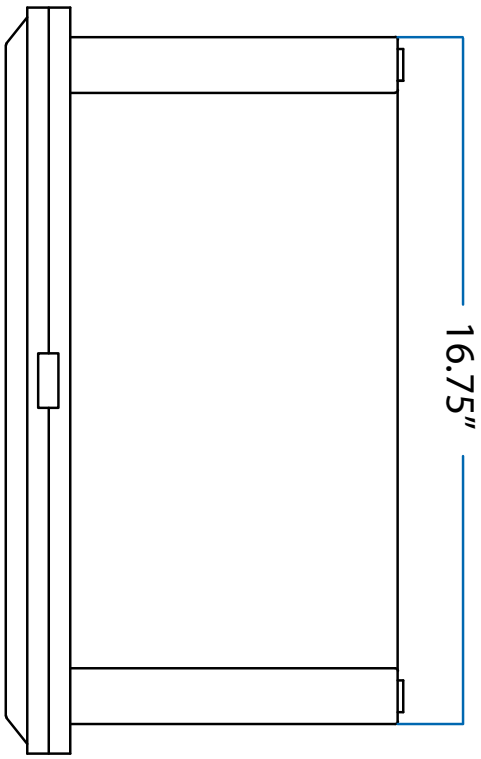
DIMENSIONAL **DRAWINGS**

Side View



Top View



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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 TVSS on energized circuits.

WARNING: CONDUCTOR DAMAGE HAZARD

- Improper conduit selection may damage conductors and create an electrical shock hazard.
- To avoid injury:
  - Route all TVSS 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 TVSS and void the warranty.
- Do Not:
  - Connect two TVSS conductors to the same phase.
  - Add wire to TVSS lead conductors.
  - Modify, alter, or disassemble the TVSS.
- Improper installation may result in reduced protection performance, equipment damage, or loss of surge protection.

NOTICE: INSTALLATION REQUIREMENTS

- A properly rated disconnecting means that energizes all phases together is recommended to facilitate safe operability of the TVSS.
- 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 TVSS performance.

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IMPORTANT **NOTES**

CRITICAL SAFETY & PERFORMANCE INFORMATION

MEDIUM VOLTAGE SYSTEMS

Medium voltage electrical systems (≥ 1,000 volts) inherently contain high available fault energy and present elevated safety risks to personnel and property. The service life and failure behavior of TVSS devices installed in medium voltage systems are influenced by electrical system configuration and operating conditions that are outside the control of the manufacturer.

TRANSFORMER CONFIGURATION

Certain transformer configurations, including **wye/wye** and **delta/delta** primary/secondary systems, are more susceptible to coupling lightning energy and other abnormal power quality events into the electrical system. Exposure to these events can significantly increase electrical stress on TVSS devices.

SYSTEM GROUNDING

Electrical systems that are **floating, ungrounded, or lack a stable and reliable ground or zero reference** are more susceptible to temporary overvoltage (TOV) conditions. Exposure to TOV can significantly increase electrical stress on TVSS devices.

POST-FUSE OPERATION & SERVICEABILITY

Determination of servicing actions is **solely the responsibility of the system owner/operator** or qualified personnel designated by the system owner/operator, who are best positioned to evaluate site-specific conditions and safety and operational risks.

Operation of an internal fuse indicates that the WS Series device has experienced an abnormal power quality event. Following a fuse operation, Maxivolt cannot confirm that the device has retained its original safety profile. Accordingly, **Maxivolt does not recommend re-fusing or returning a WS Series device to service following a fuse operation.** Maxivolt recommends replacing the complete WS Series device.

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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 medium-voltage 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.

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INSTALLATION **INSTRUCTIONS**

INSTALLATION STEPS

1. READ IMPORTANT NOTES BEFORE INSTALLING

2. De-energize System

- Disconnect all power sources.
- Verify absence of voltage prior to installation.

3. Select Mounting Location

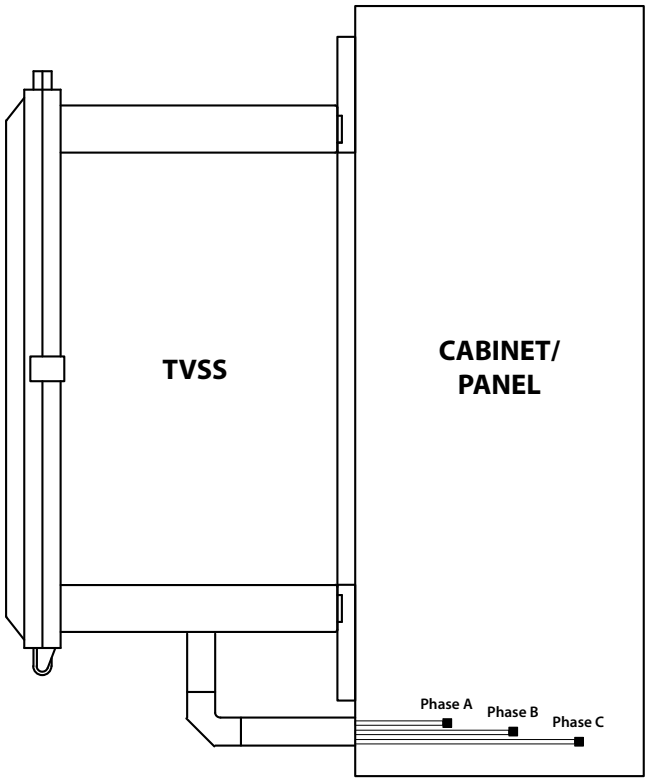
- Locate TVSS near connection points based on conduit entry.
- Install with enclosure hinge at the bottom for safe access and service.
- Ensure conductors will reach without extension.
- Minimize lead length to maintain performance.

4. Mount the TVSS

- 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 TVSS to panel.



6. Route Conductors

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

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INSTALLATION **INSTRUCTIONS**

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 conductors as follows:

  Phase A → Conductor 1
  Phase B → Conductor 2
  Phase C → Conductor 3

9. Verify Installation

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

10. Final Checks

- Ensure fuses are properly seated in fuse holders.
- Verify all wire connections are tight.
- Confirm enclosure door is fully closed and secured.

WARNING: ENERGIZATION RISK

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

11. Energize System

- Restore power only after all steps and safety checks are complete.
- Energize all phases together through a common switching device.

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OPERATION AND **MAINTENANCE**

WARNING: POST FUSE OPERATION SAFETY

- A fuse operation indicates the TVSS has experienced an abnormal power quality event.
- Following a fuse operation, Maxivolt cannot confirm the device has retained its original safety profile.
- Maxivolt does not recommend re-fusing or returning a WS Series device to service following a fuse operation.
- Maxivolt recommends replacing the complete WS Series device.

CAUTION: INSPECTION ACCURACY

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

NOTICE: SYSTEM FUNCTION

- The WS Series TVSS is a parallel device.
- Proper operation depends on:
  - The device being energized.
  - Correct installation as the path of least resistance in the system.

OPERATION

- No user interaction is required during normal operation.
- The device functions automatically when energized and properly installed.

MAINTENANCE

Routine Inspection

- Inspect the unit periodically through the clear front cover.
- Focus on the bottom of each fuse.

Fuse Status Identification

- A striker pin will extend through the bottom of the fuse when it has operated (expended).
- In some cases, the striker pin may be only slightly visible.
- Carefully inspect each fuse to confirm whether the striker pin has activated.

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OPERATION AND **MAINTENANCE**

POST-FUSE OPERATION

- If a fuse has operated:
  - Review the **IMPORTANT NOTES** section before taking any action.
  - The TVSS has experienced an abnormal power quality event.
  - Maxivolt cannot confirm that the device has retained its original safety profile.

Service Decision Responsibility

- The owner/operator is solely responsible for:
  - Determining servicing actions.
  - Evaluating site-specific conditions and safety and operational risks.
  - Maxivolt does not recommend re-fusing or returning a WS Series device to service following a fuse operation.

If the system owner/operator or qualified personnel designated by the owner/operator determine that site-specific conditions and safety and operational risks are acceptable:

- Servicing a medium-voltage TVSS is a non-routine operation.
- Service must be performed in accordance with recognized medium-voltage safety practices.
- Improper servicing may result in serious injury, death, or equipment failure.

Divot Present on Fuse Holder

Divot Not Present on Fuse Holder

Fuse Compatibility Identification

- Use the exact specified make, model, and rating only.
- Inspect the face of the bottom fuse holder:
  - If machined divot IS present, device is compatible with:

    Bussmann / Eaton 5.5CAVH1E, 5.5kV, 1A (with striker pin), *or* Ferraz Shawmut / Mersen 9F60BBD001, 5.5kV, 1A (with striker pin)
  - If machined divot IS NOT present, device is compatible with:

    Bussmann / Eaton 5.5CAVH1E, 5.5kV, 1A (with striker pin) only.

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WARRANTY

ONE (1) YEAR LIMITED WARRANTY

Maxi-Volt Corporation, Inc. (Maxivolt) warrants to the original consumer purchaser that the electrical component parts of this WS 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 (1) year.

In the event of a defect, or other failure of the WS Series Unit not caused by any misuse or damage to the WS Series Unit while in the possession of the consumer, Maxivolt will repair or replace the WS 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 WS 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 SHALL NOT BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.

SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPAIRED 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 WS Series Unit is exceeded, if the WS Series Unit has been opened or disassembled in any manner, or if the serial number of the WS Series Unit has been altered or removed. This warranty extends exclusively to the original purchaser of the WS Series Unit, and subsequent purchasers are not covered by this warranty agreement.

To obtain warranty performance, the consumer must deliver to Maxivolt: (1) the defective WS 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 WS 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, Texas 79118, attention Warranty Claim. To obtain information on warranty performance, call toll free: 1-800-585-4773. A Warranty Information Form should be filled out and included in the package containing the WS Series Unit. This form can be requested from Maxivolt at the toll free number listed above.

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

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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

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