

WS SERIES HANDBOOK



Increase Production
Reduce Downtime



TABLE OF CONTENTS

Features & Specifications	2
Dimensional Drawings	3
Important Notes	5
Installation Instructions & Wiring Diagrams	7
Operation and Maintenance	8
Warranty	9
Contact Information	10





FEATURES & SPECIFICATIONS

- Serviceable Safety Fusing
- Hybrid Surge Suppression Circuit
- No Ground Connection
- Low Clamping Voltage
- Ultra-Durable Catalysed Painted Enclosure
- NEMA® 4X Rated Enclosure
- Custom Built to Voltage Application
- 1 Year Warranty
- Made In The USA
- Patented Technology No. 6,069,781

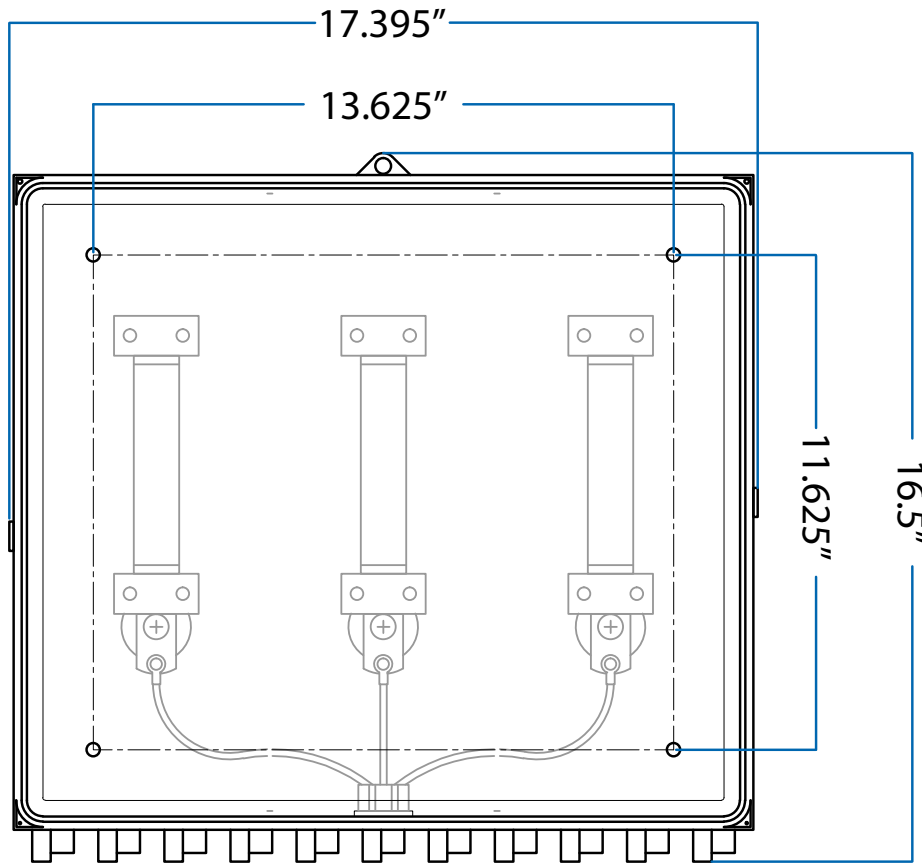
Model	WS-1500	WS-2500	WS-3600	WS-5KV
Voltage	1500 VAC	2500 VAC	3600 VAC	4160 VAC
Clamp Voltage	3400 VAC	5800 VAC	8400 VAC	9600 VAC
MCOV	2115 VAC	3525 VAC	5076 VAC	5866 VAC
Configuration	3 Ø / 3 Wire	3 Ø / 3 Wire	3 Ø / 3 Wire	3 Ø / 3 Wire
Fuse Indication	Mechanical Striker Pin	Mechanical Striker Pin	Mechanical 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-RFIB 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





DIMENSIONAL DRAWINGS

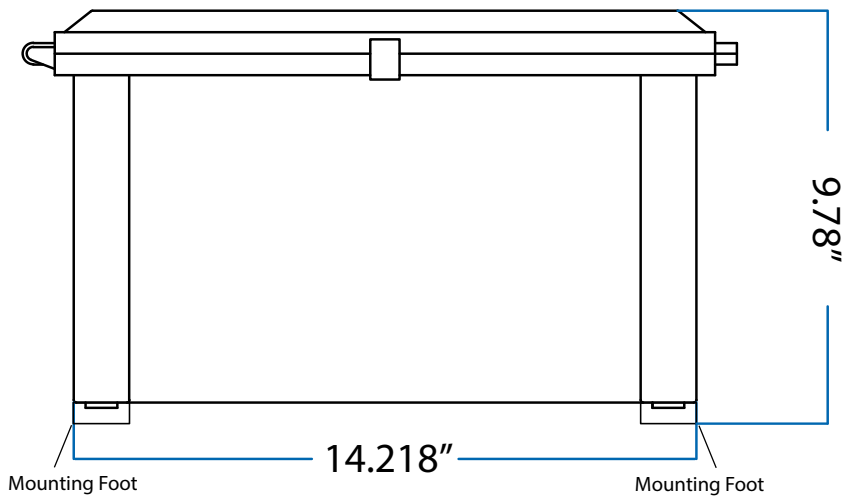
Front View



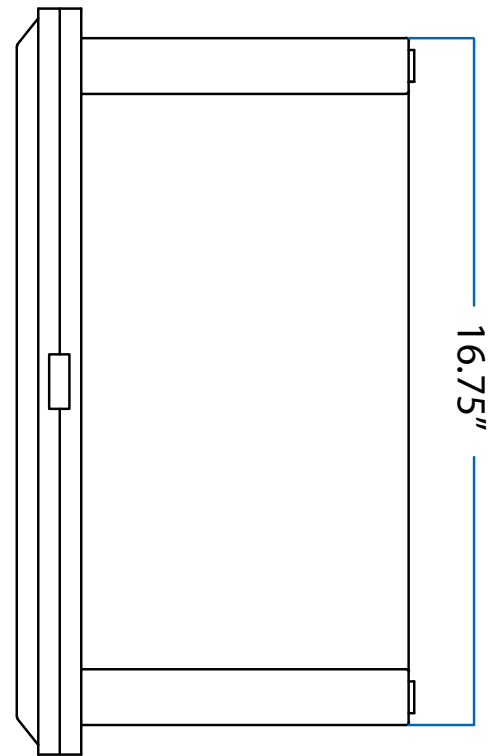


DIMENSIONAL DRAWINGS

Side View



Top View





IMPORTANT **NOTES**

MUST BE INSTALLED BY QUALIFIED MEDIUM VOLTAGE ELECTRICIAN

Safety First! Verify Absence of Voltage!

- A properly rated means of disconnect is recommended for the TVSS (Transient Voltage Surge Suppressor) to provide ability to service TVSS safely and expediently.
- Disconnect must be off during installation. Do not install TVSS with power present.
- Do not connect any two TVSS conductors to the same phase. The TVSS may be damaged and the warranty will be void due to improper installation.
- Approximately 36 inches of conductor is provided. Trim conductors as short as possible without creating strain or sharp bends. Sharp bends in the wire create impedance and negatively impact TVSS performance.
- **Do not add wire to TVSS lead conductors.** This will impair the performance of the SPD and will void the warranty.
- **ALWAYS RUN CONDUCTORS IN RIGID CONDUIT. DO NOT USE FLEX.** Flex conduit can nick conductors creating life-threatening safety hazards. Ensure conductors are not damaged.
- Do not modify the TVSS in any way. The TVSS may be damaged and void warranty.
- Delta to Wye or Wye to Delta transformers help mitigate the effects of utility coupling.

Grounding System Note:

Grounding Systems are very important for the optimum performance of your electrical system. It is mandatory that a system ground be of low resistance and impedance with no potential difference. Having a proper grounding system in conjunction with quality, properly engineered transient voltage mitigation can ensure longer life for your equipment. Your grounding system should meet NESC requirements.





IMPORTANT NOTES

MEDIUM VOLTAGE SYSTEM RISKS & TVSS SERVICEABILITY

Medium-voltage electrical systems ($\geq 1,000$ volts) inherently contain high available fault energy and present elevated risks to personnel and property. The performance, service life, and failure behavior of surge protective devices (SPDs/TVSS) installed on such systems are influenced by system configuration, grounding quality, and operating conditions outside the control of the manufacturer.

Certain transformer configurations, including wye/wye and delta/delta primary–secondary systems, are more susceptible to coupling lightning energy and other severe fault conditions into the electrical system. 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 these conditions significantly increases stress on SPDs.

Operation of an internal fuse within a medium-voltage SPD indicates that the device has experienced a severe overvoltage event. Replacement of a fuse may not restore the SPD to its original condition. Undetectable and significant internal component degradation may remain following a fuse operation.

A re-fused medium-voltage SPD may continue to operate normally; however, subsequent overvoltage events may result in a more severe failure than would be expected in a device that has not been re-fused. Accordingly, **re-fusing and continued operation following a fuse operation involves an elevated risk to personnel and property, particularly at the time of re-energization and during future overvoltage events.**

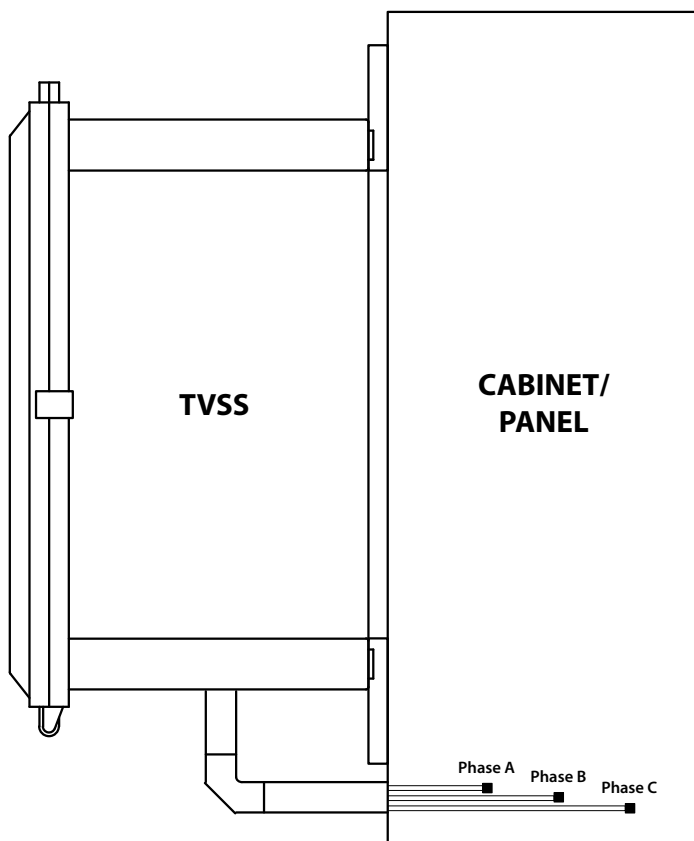
Re-energization of a medium-voltage SPD following a fuse operation shall be treated as a **non-routine activity** and performed only by qualified personnel in accordance with recognized medium-voltage safety practices. **Determination of system suitability, servicing actions, and energization practices remains the responsibility of the system owner/operator**, who is best positioned to evaluate site-specific conditions, exposure to overvoltage events, and acceptable risk.

**Contact Maxivolt with any questions concerning installation, operation and/or maintenance.
800-583-4773**



INSTALLATION INSTRUCTIONS

- Read **Important Notes** before installing TVSS. **Power must be disconnected during installation.**
- Determine mounting location in closest proximity to connection points based on where conductor piping will enter the cabinet/panel. Ensure conductors will reach connection points and lead length will be minimized. Never add wire to provided lead conductors. Do not damage or nick conductors during installation.
- Utilizing provided mounting feet, mount TVSS. Mounting feet may be installed vertically or horizontally. Hinge of TVSS should be at the bottom for ease and safety of installation and service.
- Use 3/4" weatherproof rigid conduit and pull elbow to pipe TVSS into panel.
- Carefully feed conductors through conduit and into the panel. Be sure not to damage conductor insulation.
- Trim excess conductor lengths leaving only enough slack to prevent sharp bends or strained conductors. Strip conductor insulation only enough for connection. Do not leave exposed conductor.
- Connect one conductor to Phase A, another to Phase B, and the last to Phase C.
- Confirm safety and integrity of connections, conductor insulation, and piping.
- Ensure fuses are secured in fuse holders, wire connector is tight, and door is tightly secured shut.
- Energize TVSS.



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OPERATION AND MAINTENANCE

Operation

- WS Series TVSS is a parallel device. Proper operation is solely dependent on the device having power and proper installation as the path of least resistance in the system.

Maintenance

- WS Series TVSS utilize integrated serviceable fusing to safely disconnect the protection circuit in the event of component damage or high magnitude events capable of causing component damage.
- Routinely inspect the bottom side of the fuses through the clear front. A striker pin will penetrate the bottom of the fuse when the fuse expands. In some cases, the stiker pin may only be slightly exposed to the exterior of the fuse bottom. Carefully inspect the bottom of each fuse to ensure there is no sign of stiker pin activation.
- **If you identify an expended fuse, Read the IMPORTANT NOTES section in this handbook before taking action. Replacing the fuse and continuing to operate the TVSS may increase safety risks to personnel and property. The device owner/operator is solely responsible for determining servicing actions and acceptable safety risks.**
- If the device owner/operator determines safety risks are acceptable to replace a fuse, ensure the replacement fuse is the exact correct make, model, and rating.

To determine what make, model, and rating of fuse your device will accommodate inspect the face of the bottom fuse holder. If a machined divot is present, it will accommodate either Bussman/Eaton 5.5CAVH1E 5.5KV 1A fuse fitted with a striker pin, or Ferraz Shawmut/Mersen 9F60BBD001 5.5KV 1A fuse fitted with a striker pin. If a machined divot is not present, it will only accommodate Bussman/Eaton 5.5CAVH1E 5.5KV 1A fuse fitted with a striker pin.

Servicing of a medium voltage TVSS shall be treated as a non-routine activity and performed only by qualified personnel in accordance with recognized medium voltage safety practices.



Divot Present on Fuse Holder



Divot Not Present on Fuse Holder

Contact Maxivolt with any questions concerning installation, operation and/or maintenance.

800-583-4773



WARRANTY

ONE (1) YEAR LIMITED WARRANTY

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 reinstallation; (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





ABOUT

Established in 1988, Maxivolt is a pioneer in the power quality industry. We manufacture premium power products and provide value-added services to achieve industry leading results for our clients. Our purpose is to make a difference for our clients, team members, and the communities we serve.

For more information, contact Maxivolt:

1-800-583-4773

info@maxivolt.com

www.maxivolt.com

MAXIVOLT
TRANSIENT VOLTAGE SOLUTIONS

