

**Installation Instruction for
Medium Voltage, Three Phase Delta,
3 wire + ground Suppressors
(three phases and ground)**

WARNING - HAZARDOUS VOLTAGES ARE PRESENT. Improper installation may result in serious injury to the installer and/or damage to the electrical system or related equipment. Fully read and understand all instructions before beginning the installation. Safety equipment must be used as prescribed by OSHA, whenever working around hazardous voltages.

NOTE: Surge Protective Devices designed for a rated voltage above 600 Vrms are outside the scope of UL-1449, Standard for Transient Voltage Surge Suppressors. Further, they fall outside the scope of NEC Art. 280 and 285. Therefore, while these models are made with the highest quality components that are UL listed or recognized, the completed products do not bear a UL mark as they are not eligible to bear a UL Listing mark as a transient voltage surge suppression device.

Failure of unit and/or consequential equipment damage due to improper installation or misapplication is not covered by the product warranty!

Voltage measurements and **installation must be completed by a licensed/qualified electrician** in accordance with the National and/or Canadian Electric Code, State, and Local codes. These requirements supersede this instruction.

POWER MUST BE REMOVED FROM THE ELECTRICAL SYSTEM BEFORE INSTALLING THE UNIT.

INSTALLATION MATERIALS REQUIRED

The following is a list of materials that may be needed for proper installation of this surge suppression device. This list is intended to help the installer anticipate materials needed for a successful installation. The installer should become familiar with the scope of work to avoid lost time and improper installation.

- Power Wire: 6 feet of #6 gauge wire is provided with the surge suppressor.
- 2" Hub
- Attachment Hardware: Use (four ea.) Appropriate screws or screw and anchor toggle bolts, flat washers and lock washers.
- Tools: Drill & bits, conduit knockouts, channel locks, level, screwdrivers, and appropriate safety equipment.

WIRING DIAGRAM

The units must be connected to the electrical system using one of the following types of circuit interrupt devices:

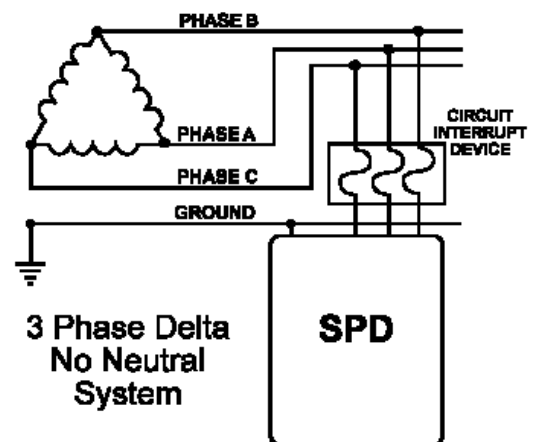
- 1 - Three Pole, 30 Amp (or less) Circuit Breaker, or 3 - Single Pole, 30 Amp (or less) Circuit Breakers; one per phase (where possible, be ganged in tandem.),
- 3 - 30 Amp (or less), Class E rated fuses. (Ex.: Ferraz-Shawmut model number: A055F1D0R0-30E (16" x 3" dia.) with 3-pair of no.: 228-700-530 CS-3 type fuse clips.).

Note: Pre-existing breakers of the rated load size (30 amp, etc...), that is serving existing loads, may be utilized if the breaker is "Listed" for this application (see NEC/CEC) and provided the owner/tenant has authorized multiple conductor termination.

The design of these units provides superior protection for sensitive/critical equipment connected to distribution panels, sub-distribution panels or individual equipment disconnects. These units are designed for use at IEEE C62.41 Location Categories A, B, and C. Fixed Clamping type units are designed for use in 50 to 420 Hz. applications.

When inspecting the panel for installation, insure that a proper safety ground is present as required by the NEC/CEC.

INSTALLATION DIAGRAM



NOTE FOR ISOLATED GROUND

The Ground wire from the unit is bonded to the enclosure internally. If the system utilizes an isolated ground, the unit enclosure must be isolated from the panel or load it is being connected to through the use of an insulated conduit fitting or other "Listed" fitting. In this installation, the green ground wire from the unit must terminate on the System isolated grounding bus.

BEFORE INSTALLATION

For proper performance, the units must be installed with the shortest lead length possible. Sharp bends should be avoided.

There are no position-oriented components in the units; therefore, the device can be mounted upside down or sideways to allow for the shortest possible lead length.

Table of Maximum Suggested Operating Voltages

3-Phase Nominal System Voltage	Phase To Phase	Phase To Ground
1000 V	1200 V	1200 V
1500 V	1800 V	1800 V
2000 V	2400 V	2400 V
2500 V	3000 V	3000 V
3000 V	3600 V	3600 V
3500 V	4200 V	4200 V
4160 V	5000 V	5000 V

INSTALLATION STEPS

STEP 1: Check Voltages

- Confirm that the system voltage does not exceed the maximum suggested operating voltage. All voltage measurements should be completed with a RMS voltmeter. **DO NOT INSTALL THE UNIT IF THE MEASURED VOLTAGE EXCEEDS THE MAXIMUM SUGGESTED OPERATING VOLTAGE OF THE DEVICE.**

CAUTION: Do not proceed further until power has been removed from the electrical system.

STEP 2: Mounting the Unit

The unit is provided with insulated cables rated for the design voltage allowing connection of conductors to electrical system terminal lugs or circuit breakers. For best performance, mount the unit so that all wires can be cut and connected in the shortest and most direct path possible. For every inch per conductor added to the installation, you increase the Let-Through Voltage of the surge suppressor by about 10 Volts for an ANSI/IEEE Std. C62 Category B3/C1 impulse.

- Visually determine the minimum lead length (shortest wire length) from the system interrupt to the casing of the device. No sharp bends should be made in the installation. If bends are unavoidable, make them smooth and flowing. The device contains no position-oriented components therefore; the device can be mounted upside down or sideways.
- If the Hub is not pre-installed, punch or drill a 2" hole through unit enclosure to ensure shortest wire leads. Be careful not to disturb or damage any internal components, and to remove any metal shavings from the inside of the unit. Mount the 2" Hub to the unit.
- Mechanically mount the unit. Secure the suppressor with screws, using the mounting feet of the enclosure.

STEP 3: Wire the Suppressor into the Electrical System

- Carefully layout the wires keeping them as short and straight as possible. After a satisfactory layout has been made to the appropriate termination points as described below, cut the wires and connect them as instructed.
- Connect the GREEN ground wire from the surge suppressor to the system ground bus bar. *Refer to earlier sections for systems utilizing an isolated ground.*
- Connect the phase or "hot" wires from the surge suppressor to the phase conductors or busses of the electrical system through the required circuit interrupts (fuses or breakers) described on first page.

*Before energizing, measure the voltage again to insure it is within the levels in the table above.
Immediate failure of the surge suppressor will occur if installed on voltages higher than these.*

STEP 4: Apply Power to the Surge Suppressor

- Indicators are non-standard on Medium Voltage models. Therefore, if device protective fusing clears or if circuit breakering trips upon model energization, remove power to the suppressor and contact Energy Control Systems at: 1.817.483.8497.