Energy Control Systems
Fort Worth, Texas U.S.A.

INSTALLATION INSTRUCTIONS for DIN-Mounted, Single/(or Dual) Phase, 3-wire Suppressors (phase, neutral or 2nd phase, and ground)

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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. Read and understand all instructions before beginning the installation. Safety equipment must be used as prescribed by OSHA, whenever working around hazardous voltages.

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 Electric Code, State, and Local codes. The National Electric Code, State and Local Code requirements supersede this instruction.

POWER MUST BE REMOVED FROM THE ELECTRICAL SYSTEM BEFORE INSTALLING THE TVSS DEVICE.

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.

- Attachment Hardware: These models snap mount onto any standard 35 mm. European metal DIN rail. A standard (regular) #6 tipped screwdriver may be used to relieve the DIN rail clip and remove the model to service or reposition the device on the rail.
- Wire Connections: Use a regular #6 (or smaller) straight-blade, cabinet-tipped, control driver to loosen / tighten terminal screws.
- Tools: Drill & bits, Torpedo Level, Screwdrivers, Fasteners, DIN rail, Appropriate Safety Equipment, etc… to mount DIN rail.

CIRCUIT INTERRUPTS & DEVICE APPLICATION

The Suppressor must be connected to the electrical system using one of the following types of 20 Ampere (max.) circuit interrupt devices:

Single-Phase (L/N/G) application models require:

- **1**- Single Pole, 20 Amp Circuit Breaker *or* **1**- 20 Amp, Class RK5 Fuse (Bussmann FRN-20) for 120 VACrms, 20 A. models.

– ***AND*** –

Dual-Phase (L/L/G) application models require:

- **1**- Double Pole *or* **2**- Single Pole, 20 Amp Circuit Breaker(s) *or* **2**- 20 Amp, Class RK5 Fuses (Bussmann FRN-20) for 208/220/240/250 VACrms, 20 A models.

Breaker Ties: 2- Single-Pole Circuit Breakers may only be used if they are installed side-by-side (i.e.: in TANDEM) using the NEC-required breaker handle-ties allowing simultaneous tripping/engagement.

Note: Pre-existing breakers of the rated load size that are serving existing loads, may be utilized if the breaker is "Listed" for this application (see NEC J 10-14) and provided the owner/tenant has authorized multiple conductor termination. (Breaker and fuse sizes shown above are maximum sizes for the associated models. Smaller ampacity interrupt devices may be used for a given model size.).

This device is suitable for use on a circuit capable of delivering not more than 10,000 RMS symmetrical Amperes, for the respective models' (max.) nominal voltage shown in the Table on pg.: 2, when protected by a 20 Amp Class RK5 fuse of appropriate rated voltage.

The design of these Suppressors ensures excellent protection for sensitive/critical equipment. "CDIN" models are designed for IEEE C62.41 'A' Location Categories, although; both model types withstand (medium) 'B3/C1' exposures with superior performance. (< see Spec. sheet.) Designed for use on 50/60 Hz. applications, only "FDIN" models should be used at locations where the voltage-frequency fluctuates (i.e.: variable frequency and/or adjustable frequency drives.).

NOTE FOR ISOLATED GROUND

Because enclosures are plastic, the ground wire from the suppressor is bonded to the surge-rated pc-board ground bus internally. If the system to be protected utilizes an Isolated Ground (IG), the green ground wire from the suppressor must terminate on the isolated ground bus for the protected system.

BEFORE INSTALLATION

Verify that system voltages are not in excess of the maximum suggested operating voltage levels listed in the table below. All voltage and current measurements should be made using a high quality RMS meter.

Do NOT install the device if the measured voltages exceed the maximum suggested operating voltage levels.

There are no position-oriented components within these Suppressors, therefore; the device can be mounted upside down or sideways to allow for best installation.

 Rev. Date: 5/ 6/ 2005.

Table of Maximum Suggested Operating Voltages

Single or Dual Phase Nominal System Voltage	Model Sequence	Phase To Neutral	Phase To Ground	Phase To 2nd Phase	*Neutral or 2nd Phase To Ground
110, 115, 120, 125	ST-xDIN120-20	132 V	132 V	132 V	< 132 V
208, 220, 240, 250	ST-xDIN240-20	264 V	264 V	264 V	< 264 V

***NOTE:** For Single-Phase Models Only- (120 Vrms) *If Neutral to Ground voltage is greater than* 5 *VAC, a problem may exist in the electrical system. The TVSS device may be installed; however, a qualified electrician or Power Quality Engineer should be consulted to correct the problem. The neutral to ground voltage listed above is a requirement by UL.*

Model Versions-
Maximum wire gage: 12 AWG for all terminals. All model versions have a NEMA-1 enclosure rating. The 'x' designator is set to 'C' for Sinewave Tracking (SWT) models & 'F' for Non-Sinewave Tracking (NSWT) models.

***NOTE:** For Single-Phase Models Only- (L/N/G) *If Neutral to Ground voltage is greater than* 5 *VAC, a problem may exist in the electrical system. The TVSS device may be installed; however, a qualified electrician or Power Quality Engineer should be consulted to correct the problem. The neutral to ground voltage listed above is a requirement by UL.*

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 SUPPRESSION DEVICE IF THE MEASURED VOLTAGE EXCEEDS THE MAXIMUM SUGGESTED OPERATING VOLTAGE SHOWN IN THE TABLE ABOVE!

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

STEP 2: Mounting the Unit

Suppressors are provided with single-row, barrier, terminal strips on both input and output sides of the device. This allows a great degree of flexibility as to the location of the device. The suppressor should be located so that it is the last device in the circuit before the equipment to be protected. The device can be mounted upside down or sideways but it should be mounted in such a manner as to allow for the greatest separation between input and output wiring.

- Mechanically mount the Suppressor by securing the device on the DIN rail using a pushing motion to snap the device in place.

STEP 3: Wiring the Suppressor into the Electrical System to be protected-

- Make sure power is removed from those conductors to be wired into the surge suppressor input (Line side) terminals.
- All series-connected wiring should be kept as short and straight as possible to facilitate a neat and efficient installation.
- Keep input and output wiring physically separated to eliminate surge-coupled contamination of protected output wiring.
- Input side wiring may be slow-twisted together thereby reducing RF-impedance; (approx. 1-twist per ft.).
- Output side wiring may be slow-twisted together thereby reducing RF-impedance; (approx. 1-twist per ft.).
- Connect the incoming system GROUND wire (Green) to the Ground terminal screw of the Suppressor on the input side.
- Connect any incoming system NEUTRAL wire (White) to the Neutral terminal screw of the Suppressor on the input side.
- Connect the incoming system PHASE wire(s) [Solid Color(s)] to respective Phase terminal(s) of the Suppressor on the input side. (^ The previous connections are to be made on the load side of the equipment circuit interrupt device.).
- Repeat the connections on the Protected Equipment (output or Load) side of the Suppressor for the equipment to be protected.

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

STEP 4: Apply Power to the Suppressor

- The LED indicator light should be illuminated. If it is not, remove power from the suppression device and contact: Energy Control Systems at: 1-(817)-483-8497.

