INSTALLATION INSTRUCTIONS for
AC & DC SERIES MODELS: xx-xSPx-###-vv-xx

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.

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 ANY xx-xSPx-###-vv-xx MODEL.

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. Failure to use fittings that are UL Listed will void the UL Listing and the Manufacturers warranty.

- Power Connections: 18-24 inches TEW stranded wire &/or terminal strips are provided on each end of the xx-xSPx-###-vv-xx.
- Attachment Hardware: Use appropriate screws or screws and anchor toggle bolts, flat washers, & lock washers.
  Alternate surface-mounting material: Double-sided, adhesive (sticky-backed) foam tape.
- Connection: Use appropriately sized wire nuts (or other positive connection hardware), or; secure leads to terminal strip screws.
- Tools: Drill & bits, Level, Screwdrivers, Appropriate Safety Equipment, etc…

WIRING DIAGRAM

The xx-xSPx-###-vv-xx unit must be connected to the electrical system using one of the following types of circuit interrupt devices:

- **1 -** Single Pole, 5/15/ 30 or 60 Amp Circuit Breaker or 3/ 5/ 15/ 30 or 60 Amp, Class RK5 Fuse per matched circuit/suppressor ampacity. [§Ex.: (1) Bussmann FRN-R-15 fuse for a 120 VAC model xx-xSPx120-15C]. Models using a Return‡ (2nd phase) lead instead of a Neutral MUST also utilize a means of automatic overcurrent interrupt per NEC. §(See model chart on page 2).

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 on such a loads' breaker.

This device is suitable for use on a circuit capable of delivering not more than 10,000 RMS symmetrical Amperes at the maximum nominal system voltage (for the properly corresponding model listed) in the MSOV Table on page 2 when protected by a 3/5/15/30 or 60 Amp, Class RK5 fuse, as specified in the beginning of this section. †Note: UL does not "LIST" TVSS devices rated for other than AC operation having working voltages less than ~100 Vrms or greater than 600 Vrms.

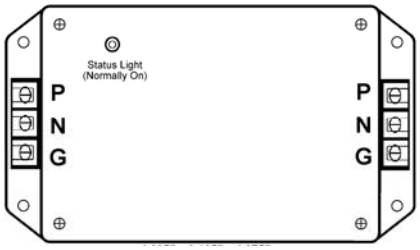
The design of the xx-SPx-###-vv-xx provides superior protection for sensitive/critical equipment. Units are designed for IEEE C62.41 Location Categories 'A'. Designed to be used in 50 to 60 Hz. applications, xx-SPx-###-vv-xx models must not be used in locations where the voltage-frequency exceeds 60 Hz. Applications exhibiting voltage-frequency variation should use xx-FSPx-###-vv-xx units.

Ex.: WIRED OPTIONS

[xx-xSPx-###-vv-xx, where; SPx = SP] Model No.: xx-xSP120-15 describes a dual wired, 120 VAC., 15 Amp unit.
DRC optioned models have contact terminations under the cover lid on a 3-position header block.

Phase or Positive
Neutral or Negative
Power Ground Wire

LINE



Phase or Positive
Neutral or Negative
Power Ground Wire

EQUIPMENT

(Standard terminal model shown)
-P Parallel units have connections on the LINE side only.

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 multimeter.

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

There are no position-oriented components in the xx-xSPx- ### -vv-xx unit; therefore, the device can be mounted upside down or sideways to allow for best installation. The installer should visualize the physical layout and wire routing prior to installation.

Table of Maximum Suggested Operating Voltages and Unit Wire Colors

Series Model Nominal System Voltage (###)		Phase to Neutral or Phase OR Positive to Negative		Phase to Ground OR Positive to Ground		*Neutral or Phase to Ground OR Negative to Ground		Phase A OR Positive Wire Color		Neutral, Phase OR Negative Wire Color		Ground Wire Color
(vv) = AC	(vv) = DC	Volts		Volts		Volts		AC	DC	AC	DC	AC & DC
		AC	DC	AC	DC	*AC	DC					
-	5	-	7.5	-	7.5	-	7.5	Black	Red	White	Black	Green
12	12	15	15	25	15	25	< 15	Black	Red	White	Black	Green
24	24	28	50	66	28	66	< 50	Black	Red	White	Black	Green
28	-	35	-	35	-	< 35	-	Black	Red	White	Black	Green
48	48	75	62	75	62	< 75	62	Black	Red	White	Black	Green
-	54	-	60	-	60	-	60	Black	Red	White	Black	Green
-	60	-	65	-	65	-	65	Black	Red	White	Black	Green
110	110	150	200	150	200	< 150	200	Black	Red	White	Black	Green
120	120	150	200	150	200	< 150	200	Black	Red	White	Black	Green
-	125	-	150	-	150	-	150	Black	Red	White	Black	Green
-	135	-	150	-	150	-	150	Black	Red	White	Black	Green
-	160		150	-	150		150	Black	Red	White	Black	Green
240	240	264	-	264	-	< 264	-	Black	Red	White	Black	Green
250	-	275	-	275	-	< 275	-	Black	Red	White	Black	Green
277	-	305	-	305	-	< 305	-	Black	Red	White	Black	Green
380	-	420	-	420	-	< 420	-	Black	Red	White	Black	Green
480		528		528		< 528		Black	Red	White	Black	Green

* *If the AC Neutral to Ground (N-G) voltage or DC Negative to Ground (Neg-Gnd) voltage measures greater than* 5 *Volts (AC or DC, respectively), a problem may exist in the electrical system. The suppressor may be installed, however; a qualified electrician or Power Quality Engineer should be consulted to correct the problem. The AC Neutral to Ground (N-G) voltage listed above is a requirement by UL.*
Note: *UL does not "LIST" TVSS devices rated for other than AC operation having working voltages less than ~100 Vrms or greater than 600 Vrms.*

MODEL NOMENCLATURE: xx-xSPx-###-vv-xx

String Prefix- (xx-xSPx)

Feature:	Designator:
SWT (all mode)	omit leading x
Fixed Suppression-	leading x = 'F'
Wires only/ both sides- (Factory Standard)	omit 2nd x
Terminals/both sides-	2nd x = ' T '
Line wires/Load Term.-	2nd x = 'WT'
Line Term./Load wires-	2nd x = 'TW'
Both Line & Load side- (Terminals AND Wires)	2nd x = '**'

Configuration Formatting- (-### -vv)

Nominal Voltage:	Designator:
Insert AC or DC Voltage-	# # #
Insert Voltage Type- (AC/DC)	v v
AC Power Voltage- (note: 'AC' is normally omitted)	v v = 'AC'
DC Power Voltage -	v v = 'DC'

Suffix Codes- (-xx)

Nominal Current:

Ampacity- xx
(3, 5, 15, 30 & 60 Amp models available.)

Options-

Feature:	Designator:
Alarm Option	AC
Dry Relay Contacts	C
No (N-G) SWT Filter	N
Remote Diagnostics (x = 1 or 2); 1 = open frame DRC/LED pcb only, 2 = # 1 above in NEMA-1 enclosure.	Rx

Special Options

DIN rail mounting	DIN
Kelvin Connections	K
Modular Telco/LAN (nn = 11, 14, 45, etc.)	RJnn
130 Vmcov MOVs (120 VAC models only)	T
Special lead lengths (Ex.: 48" leads)	-48 IN
Parallel connection	P
NEMA 4X housing	WX
Metal Housing	M

INSTALLATION STEPS

STEP 1: Check Voltages

- Confirm that the system voltage (AC or DC) does not exceed the maximum suggested operating voltage. All voltage measurements should be completed using a high quality RMS multimeter. DO NOT INSTALL THE S-xSPx- ### -vv-xx UNIT IF THE MEASURED VOLTAGE EXCEEDS THE MAXIMUM SUGGESTED OPERATING VOLTAGE OF THE DEVICE.

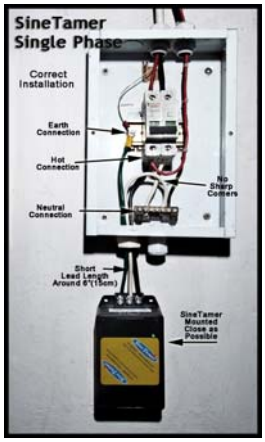
CAUTION: Do not proceed further until all power has been removed from the electrical system.

STEP 2: Mounting the Unit

The xx-xSPx- ### -vv-xx is provided with either 18-24 inches of #10 AWG TEW stranded wire or terminal strips (or both) on both the input and output ends of the device. This affords greatly improved flexibility when interfacing the device. (Only #6 AWG wires are available on the 60 Amp models.). The suppressor should be located so that it is the last device in the circuit before the equipment to be protected. The device contains no position-oriented components therefore; it can be mounted upside down or sideways, but the device should be mounted in such a way as to allow maximum separation between input and output wiring. Line (input) side power wires may be slow-twisted together thereby reducing transient RF-impedance. Load (output) side power wires may be slow-twisted together to reduce transient RF-impedance.

- Mechanically mount the xx-xSPx- ### -vv-xx. Secure the suppressor using screws & mounting feet or adhesive backed foam.

STEP 3: Wire the xx-xSPx- ### -vv-xx into the Electrical System



- Once all routed wiring is laid out, cut all wires as short as necessary to facilitate a neat installation.
- For AC or DC suppressors, connect the incoming system GROUND wire to the Green Ground wire or Ground terminal lug of the xx-xSPx- ### -vv-xx on the input side.
- For –P (parallel option) wires will be connected on the Line/Input side only. Keep wires as short (20cm / 8in) as possible.
- Connect the incoming system Neutral, Return or Negative wire to the respective White Neutral (N) wire/terminal lug or Black Negative (Neg) or Return wire/terminal lug of the xx-xSPx- ### -vv-xx on the input side.
- Connect the incoming system PHASE or Positive wire to the respective Black Phase (P) wire/terminal lug or Red Positive (Pos) wire/terminal lug of the xx-xSPx- ### -vv-xx on the input side.
  (The above connections are to be made on the load side of any Load circuit-interrupt device.).
- Repeat the respective connections on the Protected Equipment side of the suppressor when connecting to the protected Load.

Note: If necessary for additional wiring flexibility, the ST-SPTxxx-15 can also be connected in parallel, by connecting either of the two terminal sides available. The exact protocols listed above must be followed. Connection leads must be a short and straight as possible.

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: Connecting Alarm Contact Leads (C-suffix optioned models only)

- Contact optioned Suppressors are equipped with dry relay alarm contacts. They may be connected in either the normally open (NO) mode or the normally closed (NC) mode (or both) using the same common (COM). These contacts are rated for 0.5 Amps at 125 VAC or 1.0 Amps at 30 VDC. These connections are provided for remote status monitoring and are terminated in the removable, 3-position header under the cover lid of the suppressor. Terminals numbered: #3 = NC, #2 = NO, & #1 = COM. Maximum wire gage: 12 AWG. When penetrating enclosure for loop contact terminations, use a cable strain-relief fitting maintaining the NEMA-1 enclosure rating.

STEP 5: Apply Power to the xx-xSPx- ### -vv-xx

- The LED indicator light should be illuminated. If it is not, remove power from the xx-xSPx ### vv-xx device and contact the supplier or Energy Control Systems +1.817.483.8497 or info@sinetamer.com.

