Transient Voltage Surge Suppressors By:

AC Distribution Panel Unit

Model RM-ST60

"Power Quality is Our Business"

P.O. Box 330607
Ft. Worth, TX 76163
Phone: 817.483.8497
Fax: 817.572.2242
www.sinetamer.com

The SineTamer© RM series of units blends outstanding high-energy "impulse" suppression with excellent "ring-wave" transient protection. This durable device is intended for general purpose and sensitive/critical load applications. The RM-ST60 is typically installed at small service entrances up to 400 amps, distribution and sub-distribution panels. Compact size and non-metallic enclosure design also allow it to be installed directly inside electrical panels and individual equipment disconnects. The internal installation provides the absolute shortest possible lead length and optimum performance. The RM-ST60 is extremely effective in limiting internally generated transients and is an absolute must on panels feeding office locations and/or microprocessor based equipment.

This economical device has features that are not available in devices costing many times its price. Its compact size makes installation a breeze. **Maintenance Free** operation and **15 Year Unlimited Free Replacement Warranty** provide peace of mind.

GENERAL

Description:	Parallel connected, transient voltage surge suppressor device utilizing both high-energy handling and sine-wave tracking circuitry for virtual elimination of impulse and ring wave type transients. (actively tracking the AC sine wave)
Application:	Designed for use at ANSI/IEEE Categories C, B and A with susceptibility up to medium exposure levels. Designed to protect sensitive/critical loads fed from distribution panels, branch panels and/or individual equipment panels.
Warranty:	**15 Years Unlimited Free Replacement**
Product Qualifications:	**Listed to UL1449 2nd Edition (Feb. 9, 2007 Rev.) by CSA, an NRTL, CSA MC#214804, UL1283 and CE Compliant, ISO 9001:2000, ANSI C62.72-2007**

MECHANICAL

Enclosure:	High strength ABS Plastic, NEMA 4 rated enclosure.
Mounting:	3/4" conduit fitting (internally threaded) and external mounting feet.
Connection Method:	#10 stranded wire.
Shipping Weight:	≈6 lbs

ELECTRICAL

Circuit Design:	Parallel connected, internally fused, hybrid design incorporating all mode protection, and utilizing our encapsulated design to provide improved durability. All suppression circuits are encapsulated in our exclusive compound to assure long component life and complete protection from the environment and/or vibration.
Protection Modes:	L-N, L-L (Normal Mode), and L-G, N-G (Common Mode). (Seven discrete modes)
Input Power Frequency:	50-60Hz constant
Response Time:	<1 nanosecond
EMI/RFI Noise Attenuation:	30dB Max. from 1kHz to 10MHz
Capacitance:	Up to 3.5 uF Max.
Circuit Diagnostics:	Super Bright LED, 1 per phase, normally on.
Circuit Interrupt:	External and internal (see installation instructions for details).
Fusing:	Component Level Thermal and Board Level Current Fusing
kAIC Rating:	200 kAIC when installed according to installation instructions

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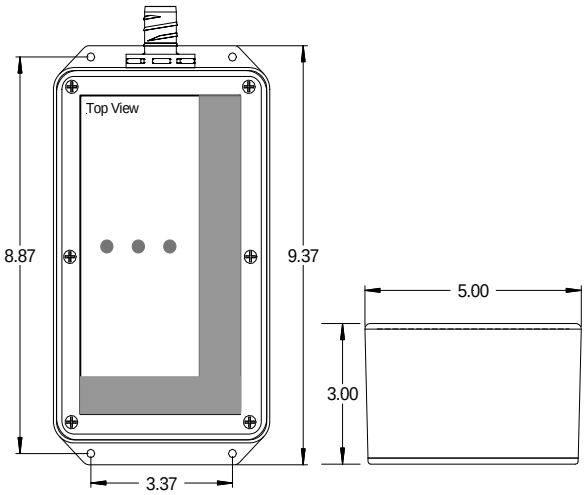
Because we are constantly seeking to improve our products, specifications are subject to change at any time.



MEASURED LIMITING VOLTAGE PERFORMANCE AND ELECTRICAL SPECIFICATIONS

Model	Circuit Type	MCOV	Peak Surge Current (Amps) Per Mode/Phase	Mode	ANSI/IEEE C62.41 & C62.45 Let-Through Voltage Test Results		
					A1 2kV, 67A 100KHz Ring Wave 270º Phase Angle	B3/C1 6kV, 3kA Impulse Wave 90º Phase Angle	C3 20kV, 10kA Impulse Wave 90º Phase Angle
RM-ST60-1P1	120V, Single Ø (2 wire + ground)	150 L-N 150 L-G 150 N-G	20,000 / 40,000	L-N L-G N-G	70 85 60	385 400 565	925 1200 1200
RM -ST60-1S1	120/240V, Split Ø (3 wire + ground)	300 L-L 150 L-N 150 L-G 150 N-G	20,000 / 40,000	L-L L-N L-G N-G	80 75 85 65	600 410 420 565	1200 914 1200 1200
RM-ST60-3Y1	120/208V, 3ØY (4 wire + ground)	300 L-L 150 L-N 150 L-G 150 N-G	20,000 / 40,000	L-L L-N L-G N-G	80 75 85 65	600 410 420 565	1200 914 1200 1200
RM -ST60-1P2	240V, Single Ø (2 wire + ground)	320 L-N 320 L-G 320 N-G	20,000 / 40,000	L-N L-G N-G	96 100 100	560 590 590	1050 1290 1290
RM -ST60-3Y2	277/480V, 3ØY 220/380V, 3ØY (4 wire + ground)	550 L-L 320 L-N 320 L-G 320 N-G	20,000 / 40,000	L-L L-N L-G N-G	135 96 100 100	895 575 575 985	1400 1050 1400 1575
RM -ST60-3N2	240V, 3∅Δ (3 wire + ground)	320 L-L 320 L-G	20,000 / 40,000	L-L L-G	96 100	643 643	1275 1275
RM -ST60-3N4	380V, 3∅Δ 480V, 3∅Δ (3 wire + ground)	550 L-L 550 L-G	20,000 / 40,000	L-L L-G	140 140	915 915	1375 1375

Let-Through Voltage Test Environment: Positive Polarity. Time base=1ms. All voltages are peak (±10%). Surge voltages are measured from the insertion point of surge on the sine wave to the peak of the surge. All tests are Dynamic (voltage applied) except N-G which is static (no voltage applied). All tests were performed with 6 inches of lead length outside the device enclosure which simulates actual "as installed" performance.

Single-pulse, surge current testing for all modes at rated currents, is in compliance with NEMA LS 1-1992. Single-pulse, surge current capacities of 200,000 amps or less are determined by single-unit testing of all components within each mode. Present industry test equipment limitations require testing of individual components or sub-assemblies within a mode for single-pulse, surge current capacities over 200,000 amps.

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Transient Voltage Surge Suppressors By:

AC Distribution Panel Unit

Model RM-ST120

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The SineTamer© RM series of units blends outstanding high-energy "impulse" suppression with excellent "ring-wave" transient protection utilizing our Frequency Attenuation Network®. This durable device is intended for general purpose and sensitive/critical load applications. The RM-ST120 is typically installed at small service entrances up to 800 amps, distribution and sub-distribution panels. Compact size and non-metallic enclosure design also allow it to be installed directly inside electrical panels and individual equipment disconnects. The internal installation provides the absolute shortest possible lead length and optimum performance. The RM-ST120 is extremely effective in limiting internally generated transients and is an absolute must on panels feeding office locations and/or microprocessor based equipment.

This economical device has features that are not available in devices costing many times its price. Its compact size makes installation a breeze. **Maintenance Free** operation and **15 Year Unlimited Free Replacement Warranty** provide peace of mind.

GENERAL

Description:	Parallel connected, transient voltage surge suppressor device utilizing both high-energy handling and Frequency Attenuation Network® circuitry for virtual elimination of impulse and ring wave type transients. (tracking and monitoring the AC sine wave)
Application:	Designed for use at ANSI/IEEE Categories C, B and A with susceptibility up to medium exposure levels. Designed to protect sensitive/critical loads fed from distribution panels, branch panels and/or individual equipment panels.
Warranty:	**15 Years Unlimited Free Replacement**
Product Qualifications:	**Listed to UL1449 2nd Edition (Feb. 9, 2007 Rev.) by CSA, an NRTL, CSA MC#214804, UL1283 and CE Compliant, ISO 9001:2000, ANSI C62.72-2007**

MECHANICAL

Enclosure:	High strength ABS Plastic, NEMA 4 rated enclosure.
Mounting:	3/4" conduit fitting (internally threaded) and external mounting feet.
Connection Method:	#10 stranded wire.
Shipping Weight:	≈6lbs

ELECTRICAL

Circuit Design:	Parallel connected, internally fused, hybrid design incorporating all mode protection, and utilizing our encapsulated design to provide improved durability. All suppression circuits are encapsulated in our exclusive compound to assure long component life and complete protection from the environment and/or vibration.
Protection Modes:	L-N, L-L (Normal Mode), and L-G, N-G (Common Mode). (Seven discrete modes)
Input Power Frequency:	50-60Hz constant
Response Time:	<1 nanosecond
EMI/RFI Noise Attenuation:	30dB Max. from 1kHz to 10MHz
Circuit Diagnostics:	Super Bright LED, 1 per phase, normally on.
Circuit Interrupt:	External and internal (see installation instructions for details).
Fusing:	Component Level Thermal and Board Level Current Fusing
kAIC Rating:	200 kAIC when installed according to installation instructions

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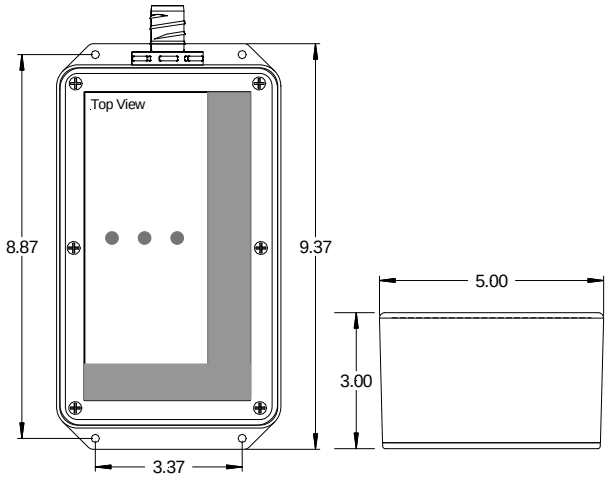

MEASURED LIMITING VOLTAGE PERFORMANCE AND ELECTRICAL SPECIFICATIONS

Model	Circuit Type	MCOV	Peak Surge Current (Amps) Per Mode/Phase	Mode	ANSI/IEEE C62.41 & C62.45 Let-Through Voltage Test Results		
					A1 2kV, 67A 100KHz Ring Wave 270º Phase Angle	B3/C1 6kV, 3kA Impulse Wave 90º Phase Angle	C3 20kV, 10kA Impulse Wave 90º Phase Angle
RM-ST120-1P1	120V, Single Ø (2 wire + ground)	150 L-N 150 L-G 150 N-G	40,000 / 80,000	L-N L-G N-G	70 85 60	385 400 565	925 1200 1200
RM -ST120-1S1	120/240V, Split Ø (3 wire + ground)	300 L-L 150 L-N 150 L-G 150 N-G	40,000 / 80,000	L-L L-N L-G N-G	80 75 85 65	600 410 420 565	1200 914 1200 1200
RM-ST120-3Y1	120/208V, 3ØY (4 wire + ground)	300 L-L 150 L-N 150 L-G 150 N-G	40,000 / 80,000	L-L L-N L-G N-G	80 75 85 65	600 410 420 565	1200 914 1200 1200
RM -ST120-1P2	240V, Single Ø (2 wire + ground)	320 L-N 320 L-G 320 N-G	40,000 / 80,000	L-N L-G N-G	96 100 100	560 590 590	1050 1290 1290
RM -ST120-3Y2	220/380V, 3ØY 277/480V, 3ØY (4 wire + ground)	550 L-L 320 L-N 320 L-G 320 N-G	40,000 / 80,000	L-L L-N L-G N-G	135 96 100 100	895 575 575 985	1400 1050 1400 1575
RM -ST120-3N2	240V, 3∅Δ (3 wire + ground)	320 L-L 320 L-G	40,000 / 80,000	L-L L-G	96 100	643 643	1275 1275
RM -ST120-3N4	380V, 3∅Δ 480V, 3∅Δ (3 wire + ground)	550 L-L 550 L-G	40,000 / 80,000	L-L L-G	140 140	915 915	1375 1375

Let-Through Voltage Test Environment: Positive Polarity. Time base=1ms. All voltages are peak (±10%). Surge voltages are measured from the insertion point of surge on the sine wave to the peak of the surge. All tests are Dynamic (voltage applied) except N-G which is static (no voltage applied). All tests were performed with 6 inches of lead length outside the device enclosure which simulates actual "as installed" performance.

Single-pulse, surge current testing for all modes at rated currents, is in compliance with NEMA LS 1-1992. Single-pulse, surge current capacities of 200,000 amps or less are determined by single-unit testing of all components within each mode. Present industry test equipment limitations require testing of individual components or sub-assemblies within a mode for single-pulse, surge current capacities over 200,000 amps.

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Transient Voltage Surge Suppressors By:

AC Distribution Panel Unit

Model RM-ST180

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www.sinetamer.com

The SineTamer© RM series of units blends outstanding high-energy "impulse" suppression with excellent "ring-wave" transient protection utilizing our Frequency Attenuation Network®. This durable device is intended for general purpose and sensitive/critical load applications. The RM-ST180 is typically installed at small service entrances up to 1200 amps, distribution and sub-distribution panels. Compact size and non-metallic enclosure design also allow it to be installed directly inside electrical panels and individual equipment disconnects. The internal installation provides the absolute shortest possible lead length and optimum performance. The RM-ST180 is extremely effective in limiting internally generated transients and is an absolute must on panels feeding office locations and/or microprocessor based equipment.

This economical device has features that are not available in devices costing many times its price. Its compact size makes installation a breeze. **Maintenance Free** operation and **15 Year Unlimited Free Replacement Warranty** provide peace of mind.

GENERAL

Description:	Parallel connected, transient voltage surge suppressor device utilizing both high-energy handling and Frequency Attenuation Network® circuitry for virtual elimination of impulse and ring wave type transients. (tracking and monitoring the AC sine wave)
Application:	Designed for use at ANSI/IEEE Categories C, B and A with susceptibility up to medium exposure levels. Designed to protect sensitive/critical loads fed from distribution panels, branch panels and/or individual equipment panels.
Warranty:	**15 Years Unlimited Free Replacement**
Product Qualifications:	**Listed to UL1449 2nd Edition (Feb. 9, 2007 Rev.) by CSA, an NRTL, CSA MC#214804, UL1283 and CE Compliant, ISO 9001:2000, ANSI C62.72-2007**

MECHANICAL

Enclosure:	High strength ABS Plastic, NEMA 4 rated enclosure.
Mounting:	3/4" conduit fitting (internally threaded) and external mounting feet.
Connection Method:	#10 stranded wire.
Shipping Weight:	≈6lbs

ELECTRICAL

Circuit Design:	Parallel connected, internally fused, hybrid design incorporating all mode protection, and utilizing our encapsulated design to provide improved durability. All suppression circuits are encapsulated in our exclusive compound to assure long component life and complete protection from the environment and/or vibration.
Protection Modes:	L-N, L-L (Normal Mode), and L-G, N-G (Common Mode). (Seven discrete modes)
Input Power Frequency:	50-60Hz constant
Response Time:	<1 nanosecond
EMI/RFI Noise Attenuation:	30dB Max. from 1kHz to 10MHz
Circuit Diagnostics:	Super Bright LED, 1 per phase, normally on.
Circuit Interrupt:	External and internal (see installation instructions for details).
Fusing:	Component Level Thermal and Board Level Current Fusing
kAIC Rating:	200 kAIC when installed according to installation instructions

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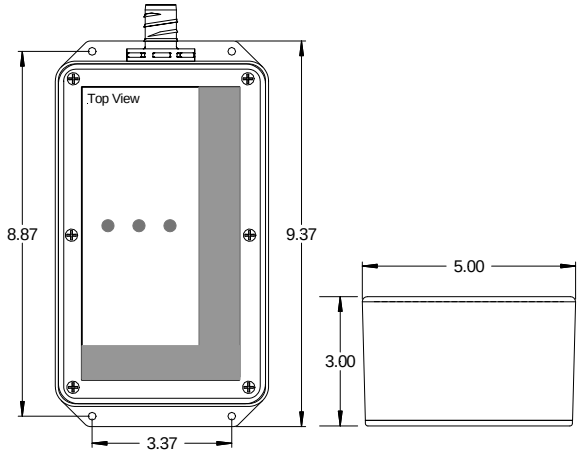

MEASURED LIMITING VOLTAGE PERFORMANCE AND ELECTRICAL SPECIFICATIONS

Model	Circuit Type	MCOV	Peak Surge Current (Amps) Per Mode/Phase	Mode	ANSI/IEEE C62.41 & C62.45 Let-Through Voltage Test Results		
					A1 2kV, 67A 100KHz Ring Wave 270º Phase Angle	B3/C1 6kV, 3kA Impulse Wave 90º Phase Angle	C3 20kV, 10kA Impulse Wave 90º Phase Angle
RM-ST180-1P1	120V, Single Ø (2 wire + ground)	150 L-N 150 L-G 150 N-G	60,000 / 120,000	L-N L-G N-G	70 85 60	385 400 565	925 1200 1200
RM -ST180-1S1	120/240V, Split Ø (3 wire + ground)	300 L-L 150 L-N 150 L-G 150 N-G	60,000 / 120,000	L-L L-N L-G N-G	80 75 85 65	600 410 420 565	1200 914 1200 1200
RM-ST180-3Y1	120/208V, 3ØY (4 wire + ground)	300 L-L 150 L-N 150 L-G 150 N-G	60,000 / 120,000	L-L L-N L-G N-G	80 75 85 65	600 410 420 565	1200 914 1200 1200
RM -ST180-1P2	240V, Single Ø (2 wire + ground)	320 L-N 320 L-G 320 N-G	60,000 / 120,000	L-N L-G N-G	96 100 100	560 590 590	1050 1290 1290
RM -ST180-3Y2	220/380V, 3ØY 277/480V, 3ØY (4 wire + ground)	550 L-L 320 L-N 320 L-G 320 N-G	60,000 / 120,000	L-L L-N L-G N-G	135 96 100 100	895 575 575 985	1400 1050 1400 1575
RM -ST180-3N2	240V, 3∅Δ (3 wire + ground)	320 L-L 320 L-G	60,000 / 120,000	L-L L-G	96 100	643 643	1275 1275
RM -ST180-3N4	380V, 3∅Δ 480V, 3∅Δ (3 wire + ground)	550 L-L 550 L-G	60,000 / 120,000	L-L L-G	140 140	915 915	1375 1375

Let-Through Voltage Test Environment: Positive Polarity. Time base=1ms. All voltages are peak (±10%). Surge voltages are measured from the insertion point of surge on the sine wave to the peak of the surge. All tests are Dynamic (voltage applied) except N-G which is static (no voltage applied). All tests were performed with 6 inches of lead length outside the device enclosure which simulates actual "as installed" performance.

Single-pulse, surge current testing for all modes at rated currents, is in compliance with NEMA LS 1-1992. Single-pulse, surge current capacities of 200,000 amps or less are determined by single-unit testing of all components within each mode. Present industry test equipment limitations require testing of individual components or sub-assemblies within a mode for single-pulse, surge current capacities over 200,000 amps.

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Transient Voltage Surge Suppressors By:

AC Distribution Panel Unit

Model LA-ST120

Dedicated Protection Components And Circuitry For Each Mode

"Power Quality is Our Business"

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Fax: 817.572.2242
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The SineTamer© LA series of units blends outstanding high-energy "impulse" suppression with unsurpassed "ring-wave" transient protection Frequency Attenuation Network®. This durable device is intended for general purpose and sensitive/critical load applications. The LA-ST120 is typically installed at small service entrances, distribution and sub-distribution panels. Compact size and non-metallic enclosure design also allow it to be installed directly inside electrical panels and individual equipment disconnects. The internal installation provides the absolute shortest possible lead length and optimum performance. The LA-ST120 is extremely effective in limiting internally generated transients and is an absolute must on panels feeding office locations and/or microprocessor based equipment.

This economical device has features that are not available in devices costing many times its price. Its compact size makes installation a breeze. **Maintenance Free** operation and **20 Year Unlimited Free Replacement Warranty** provide peace of mind.

GENERAL

Description:	Parallel connected, transient voltage surge suppressor device utilizing both high-energy handling and Frequency Attenuation Network® circuitry for virtual elimination of ring wave type transients. Rated peak surge current of 40 ka per mode / 120 ka per phase.
Application:	Designed for use at ANSI/IEEE Categories C, B and A with susceptibility up to medium exposure levels. Designed to protect sensitive/critical loads fed from distribution panels.
Warranty:	**20 Years Unlimited Free Replacement**
Product Qualifications:	**Listed to UL1449 2nd Edition (Feb. 9, 2007 Rev.) by CSA, an NRTL, CSA MC#214804, UL1283 and CE Compliant, ISO 9001:2000, ANSI C62.72-2007, IEC 61643-1 (Class 2 & 3)**

MECHANICAL

Enclosure:	High strength ABS Plastic, NEMA 4 rated enclosure
Mounting:	1" conduit fitting (internally threaded) and external mounting feet.
Connection Method:	#10 stranded wire.
Shipping Weight:	≈ 6lbs

ELECTRICAL

Circuit Design:	Parallel connected, internally fused, hybrid design incorporating discrete all mode protection (10 modes for 3 phase wye units*) and utilizing our encapsulated design to provide improved durability. All suppression circuits are encapsulated in our exclusive compound to assure long component life and complete protection from the environment and/or vibration.
Protection Modes:	Dedicated protection components and circuitry for each mode. Discrete L-N, L-L (Normal Mode), and Discrete L-G, N-G (Common Mode). 10 modes / 3 phase wye system.
Input Power Frequency:	50-420Hz constant (60Hz typical)
EMI/RFI Noise Attenuation:	30dB Max. from 1kHz to 10MHz
Circuit Diagnostics:	Super Bright LED, 1 per phase, normally on. Dry relay contacts for remote monitoring.
Circuit Interrupt:	External and internal (see installation instructions for details).
Fusing:	Component Level Thermal and Board Level Current Fusing
kAIC Rating:	200 kAIC when installed according to installation instructions

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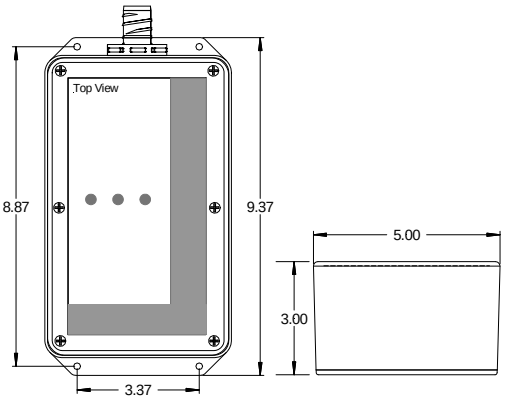

MEASURED LIMITING VOLTAGE PERFORMANCE AND ELECTRICAL SPECIFICATIONS

Model	Circuit Type	MCOV	Peak Surge Current (Amps) Per Mode	Mode	ANSI/IEEE C62.41 & C62.45 Let-Through Voltage Test Results		
					A1 2kV, 67A 100KHz Ring Wave 270º Phase Angle	B3/C1 6kV, 3kA Impulse Wave 90º Phase Angle	C3 20kV, 10kA Impulse Wave 90º Phase Angle
LA-ST120-1P1C	120V, Single Ø (2 wire + ground)	150 L-N 150 L-G 150 N-G	40,000 L-N 40,000 L-G 40,000 N-G 120,000 Total	L-N L-G N-G	45 60 55	385 400 560	914 1025 1176
LA-ST120-1S1C	120/240V, Split Ø (3 wire + ground)	300 L-L 150 L-N 150 L-G 150 N-G	40,000 L-L 40,000 L-N 40,000 L-G 40,000 N-G 240,000 Total	L-L L-N L-G N-G	75 45 60 55	570 385 400 560	1119 914 1025 1176
LA-ST120-3Y1C	120/208V, 3ØY (4 wire + ground)	300 L-L 150 L-N 150 L-G 150 N-G	40,000 L-L 40,000 L-N 40,000 L-G 40,000 N-G 400,000 Total	L-L L-N L-G N-G	55 45 60 55	570 385 400 560	1119 914 1025 1176
LA-ST120-1P2C	240V, Single Ø (2 wire + ground)	320 L-N 320 L-G 320 N-G	40,000 L-N 40,000 L-G 40,000 N-G 120,000 Total	L-N L-G N-G	60 80 55	560 590 965	1050 1262 1575
LA-ST120-3Y2C	220/380V, 3ØY 277/480V, 3ØY (4 wire + ground)	550 L-L 320 L-N 320 L-G 320 N-G	40,000 L-L 40,000 L-N 40,000 L-G 40,000 N-G 400,000 Total	L-L L-N L-G N-G	130 60 80 55	895 560 590 965	1344 1050 1262 1575
LA-ST120-3N2C	240V, 3∅Δ (3 wire + ground)	320 L-L 320 L-G	40,000 L-L 40,000 L-G 240,000 Total	L-L L-G	60 75	590 590	1262 1262
LA-ST120-3N4C	380V, 3∅Δ 480V, 3∅Δ (3 wire + ground)	550 L-L 550 L-G	40,000 L-L 40,000 L-G 240,000 Total	L-L L-G	60 130	895 895	1344 1344
LA-ST120-3N6C	550V, 3∅Δ 660V, 3∅Δ (3 wire + ground)	750 L-L 750 L-G	40,000 L-L 40,000 L-G 240,000 Total	L-L L-G	160 140	1250 1290	1750 1690

Let-Through Voltage Test Environment: Positive Polarity. Time base=1ms. All voltages are peak (±10%). Surge voltages are measured from the insertion point of surge on the sine wave to the peak of the surge. All tests are Dynamic (voltage applied) except N-G which is static (no voltage applied). All tests were performed with 6 inches of lead length outside the device enclosure which simulates actual "as installed" performance.

Single-pulse, surge current testing for all modes at rated currents, is in compliance with NEMA LS 1-1992. Single-pulse, surge current capacities of 200,000 amps or less are determined by single-unit testing of all components within each mode. Present industry test equipment limitations require testing of individual components or sub-assemblies within a mode for single-pulse, surge current capacities over 200,000 amps.

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Transient Voltage Surge Suppressors By:

AC Distribution Panel Unit — *Model LA-ST180*

Dedicated Protection Components And Circuitry For Each Mode

SineTamer

Made in the USA

"Power Quality is Our Only Business"

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This economical device has features that are not available in devices costing many times its price. Its compact size makes installation a breeze. **Maintenance Free** operation and **20 Year Unlimited Free Replacement Warranty** provide peace of mind.

GENERAL

Description:	Parallel connected, transient voltage surge suppressor device utilizing both high-energy handling and Frequency Attenuation Network® circuitry for virtual elimination of ring wave type transients. (60kA per mode or 180 ka per phase - peak surge current)
Application:	Designed for use at ANSI/IEEE Categories C, B and A with susceptibility up to medium exposure levels. Designed to protect sensitive/critical loads fed from distribution panels, branch panels and/or individual equipment panels.
Warranty:	**20 Years Unlimited Free Replacement**
Product Qualifications:	**Listed to UL1449 2nd Edition (Feb. 9, 2007 Rev.) by CSA, an NRTL, CSA MC#214804, UL1283 and CE Compliant, ISO 9001:2000, ANSI C62.72-2007, IEC 61643-1 (Class 2 & 3)**

MECHANICAL

Enclosure:	High strength ABS Plastic, Nema 4 rated
Mounting:	2.54 cm conduit fitting (internally threaded) and external mounting feet.
Connection Method:	#10 stranded wire // 2.60 mm dia.
Shipping Weight:	≈6 lbs // 2.7 kg

ELECTRICAL

Circuit Design:	Parallel connected, internal thermal fusing, hybrid design incorporating discrete all mode protection (10 modes for 3 phase wye units*) and utilizing our encapsulated design to provide improved durability. Suppression circuits are encapsulated in our exclusive compound to assure long component life and protection from the environment and/or vibration.
Protection Modes:	Dedicated protection components and circuitry for each mode. Discrete L-N, L-L (Normal Mode), and Discrete L-G, N-G (Common Mode). 10 modes / 3 phase wye system.
Input Power Frequency:	50-60Hz
EMI/RFI Noise Attenuation:	30dB Max. from 1kHz to 10MHz
Circuit Diagnostics:	Super Bright LED, 1 per phase, normally on. Dry relay contacts for remote monitoring.
Circuit Interrupt:	External and internal (see installation instructions for details).
Fusing:	Component Level Thermal and Board Level Current Fusing
kAIC Rating:	200 kAIC when installed according to installation instructions

C SA® US

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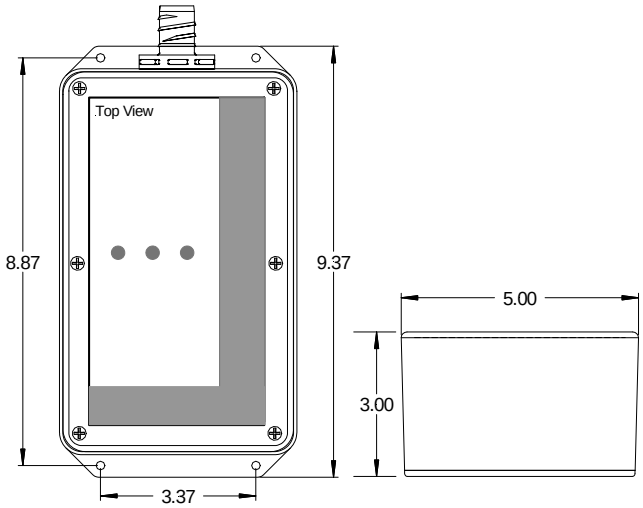

MEASURED LIMITING VOLTAGE PERFORMANCE AND ELECTRICAL SPECIFICATIONS

Model	Circuit Type	MCOV	Peak Surge Current (Amps) Per Mode	Mode	ANSI/IEEE C62.41 & C62.45 Let-Through Voltage Test Results		
					A1 2kV, 67A 100KHz Ring Wave 270º Phase Angle	B3/C1 6kV, 3kA Impulse Wave 90º Phase Angle	C3 20kV, 10kA Impulse Wave 90º Phase Angle
LA-ST180-1P1C	120V, Single Ø (2 wire + ground)	150 L-N 150 L-G 150 N-G	60,000 L-N 60,000 L-G 60,000 N-G 180,000 Total	L-N L-G N-G	45 60 55	385 400 560	914 1025 1176
LA-ST180-1S1C	120/240V, Split Ø (3 wire + ground)	300 L-L 150 L-N 150 L-G 150 N-G	60,000 L-L 60,000 L-N 60,000 L-G 60,000 N-G 300,000 Total	L-L L-N L-G N-G	75 45 60 55	570 385 400 560	1119 914 1025 1176
LA-ST180-3Y1C	120/208V, 3ØY (4 wire + ground)	300 L-L 150 L-N 150 L-G 150 N-G	60,000 L-L 60,000 L-N 60,000 L-G 60,000 N-G 300,000 Total	L-L L-N L-G N-G	55 45 60 55	570 385 400 560	1119 914 1025 1176
LA-ST180-1P2C	240V, Single Ø (2 wire + ground)	320 L-N 320 L-G 320 N-G	60,000 L-N 60,000 L-G 60,000 N-G 180,000 Total	L-N L-G N-G	60 80 55	560 590 965	1050 1262 1575
LA-ST180-3Y2C	277/480V, 240/415V, 220/380V, 3ØY (4 wire + ground)	550 L-L 320 L-N 320 L-G 320 N-G	60,000 L-L 60,000 L-N 60,000 L-G 60,000 N-G 600,000 Total	L-L L-N L-G N-G	130 60 80 55	895 560 590 965	1344 1050 1262 1575
LA-ST180-3N2C	240V, 3∅Δ (3 wire + ground)	320 L-L 320 L-G	60,000 L-L 60,000 L-G 360,000 Total	L-L L-G	60 75	590 590	1262 1262
LA-ST180-3N4C	380V, 3∅Δ 480V, 3∅Δ (3 wire + ground)	550 L-L 550 L-G	60,000 L-L 60,000 L-G 360,000 Total	L-L L-G	60 130	895 895	1344 1344

Let-Through Voltage Test Environment: Positive Polarity. Time base=1ms. All voltages are peak (±10%). Surge voltages are measured from the insertion point of surge on the sine wave to the peak of the surge. All tests are Dynamic (voltage applied) except N-G which is static (no voltage applied). All tests were performed with 6 inches of lead length outside the device enclosure which simulates actual "as installed" performance.

Single-pulse, surge current testing for all modes at rated currents, is in compliance with NEMA LS 1-1992. Single-pulse, surge current capacities of 200,000 amps or less are determined by single-unit testing of all components within each mode. Present industry test equipment limitations require testing of individual components or sub-assemblies within a mode for single-pulse, surge current capacities over 200,000 amps.

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Transient Voltage Surge Suppressors By:

AC Distribution Panel Unit

Model LA-ST240

Dedicated Protection Components And Circuitry For Each Mode

Made in the USA

"Power Quality is Our Business"

P.O. Box 330607
Ft. Worth, TX 76163
Phone: 817.483.8497
Fax: 817.572.2242
www.sinetamer.com

The SineTamer© LA series of units blends outstanding high-energy "impulse" suppression with unsurpassed "ring-wave" transient protection Frequency Attenuation Network®. This durable device is intended for general purpose and sensitive/critical load applications. The LA-ST240 is typically installed at service entrances up to 2400 amps, distribution and sub-distribution panels. Compact size and non-metallic enclosure design also allow it to be installed directly inside electrical panels and individual equipment disconnects. The internal installation provides the absolute shortest possible lead length and optimum performance. The LA-ST240 is extremely effective in limiting internally generated transients and is an absolute must on panels feeding office locations and/or microprocessor based equipment.

This economical device has features that are not available in devices costing many times its price. Its compact size makes installation a breeze. **Maintenance Free** operation and **20 Year Unlimited Free Replacement Warranty** provide peace of mind.

GENERAL

Description:	Parallel connected, transient voltage surge suppressor device utilizing both high-energy handling and Frequency Attenuation Network® circuitry for virtual elimination of ring wave type transients. Peak surge current of 240 ka per phase or 80 ka per mode.
Application:	Designed for use at ANSI/IEEE Categories C, B and A with susceptibility up to medium exposure levels. Designed to protect sensitive/critical loads fed from distribution panels, branch panels and/or individual equipment panels.
Warranty:	**20 Years Unlimited Free Replacement**
Product Qualifications:	**Listed to UL1449 2nd Edition (Feb. 9, 2007 Rev.) by CSA, an NRTL, CSA MC#214804, UL1283 and CE Compliant, ISO 9001:2000, ANSI C62.72-2007, IEC 61643-1 (Class 2 & 3)**

MECHANICAL

Enclosure:	High strength ABS Plastic, Nema 4 and IP66 rated enclosure.
Mounting:	1" conduit fitting (internally threaded) and external mounting feet.
Connection Method:	#10 stranded wire.
Shipping Weight:	≈ 6 lbs

ELECTRICAL

Circuit Design:	Parallel connected, internally fused, hybrid design incorporating discrete all mode protection (10 modes for 3 phase wye units*) and utilizing our encapsulated design to provide improved durability. All suppression circuits are encapsulated in our exclusive compound to assure long component life and complete protection from the environment and/or vibration.
Protection Modes:	Dedicated protection components and circuitry for each mode. Discrete L-N, L-L (Normal Mode), and Discrete L-G, N-G (Common Mode). 10 modes / 3 phase wye system.
Input Power Frequency:	50- 60Hz
EMI/RFI Noise Attenuation:	40dB Max. from 1kHz to 10MHz (normal and common mode)
Circuit Diagnostics:	Super Bright LED, 1 per phase, normally on. Dry relay contacts for remote monitoring.
Circuit Interrupt:	External and internal (see installation instructions for details).
Fusing:	Component Level Thermal and Board Level Current Fusing
kAIC Rating:	200 kAIC when installed according to installation instructions

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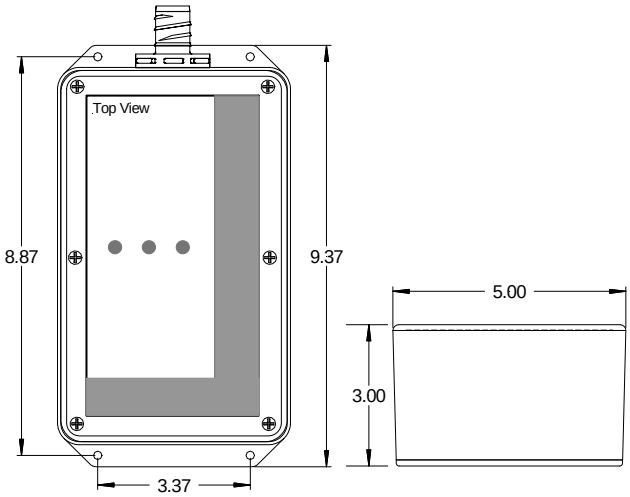

MEASURED LIMITING VOLTAGE PERFORMANCE AND ELECTRICAL SPECIFICATIONS

Model	Circuit Type	MCOV	Peak Surge Current (Amps) Per Mode	Mode	ANSI/IEEE C62.41 & C62.45 Let-Through Voltage Test Results		
					A1 2kV, 67A 100KHz Ring Wave 270º Phase Angle	B3/C1 6kV, 3kA Impulse Wave 90º Phase Angle	C3 20kV, 10kA Impulse Wave 90º Phase Angle
LA-ST240-1P1C	120V, Single Ø (2 wire + ground)	150 L-N 150 L-G 150 N-G	80,000 L-N 80,000 L-G 80,000 N-G 240,000 Total	L-N L-G N-G	45 60 55	385 400 560	914 1025 1176
LA-ST240-1S1C	120/240V, Split Ø (3 wire + ground)	300 L-L 150 L-N 150 L-G 150 N-G	80,000 L-L 80,000 L-N 80,000 L-G 80,000 N-G 480,000 Total	L-L L-N L-G N-G	75 45 60 55	570 385 400 560	1119 914 1025 1176
LA-ST240-3Y1C	120/208V, 3ØY (4 wire + ground)	300 L-L 150 L-N 150 L-G 150 N-G	80,000 L-L 80,000 L-N 80,000 L-G 80,000 N-G 800,000 Total	L-L L-N L-G N-G	55 45 60 55	570 385 400 560	1119 914 1025 1176
LA-ST240-1P2C	240V, Single Ø (2 wire + ground)	320 L-N 320 L-G 320 N-G	80,000 L-N 80,000 L-G 80,000 N-G 240,000 Total	L-N L-G N-G	60 80 55	560 590 965	1050 1262 1575
LA-ST240-3Y2C	277/480V, 3ØY 220/380V, 3ØY (4 wire + ground)	550 L-L 320 L-N 320 L-G 320 N-G	80,000 L-L 80,000 L-N 80,000 L-G 80,000 N-G 800,000 Total	L-L L-N L-G N-G	130 60 80 55	895 560 590 965	1344 1050 1262 1575
LA-ST240-3N2C	240V, 3∅Δ (3 wire + ground)	320 L-L 320 L-G	80,000 L-L 80,000 L-G 480,000 Total	L-L L-G	60 75	590 590	1262 1262
LA-ST240-3N4C	380V, 3∅Δ 480V, 3∅Δ (3 wire + ground)	550 L-L 550 L-G	80,000 L-L 80,000 L-G 480,000 Total	L-L L-G	60 130	895 895	1344 1344

Let-Through Voltage Test Environment: Positive Polarity. Time base=1ms. All voltages are peak (±10%). Surge voltages are measured from the insertion point of surge on the sine wave to the peak of the surge. All tests are Dynamic (voltage applied) except N-G which is static (no voltage applied). All tests were performed with 6 inches of lead length outside the device enclosure which simulates actual "as installed" performance.

Single-pulse, surge current testing for all modes at rated currents, is in compliance with NEMA LS 1-1992. Single-pulse, surge current capacities of 200,000 amps or less are determined by single-unit testing of all components within each mode. Present industry test equipment limitations require testing of individual components or sub-assemblies within a mode for single-pulse, surge current capacities over 200,000 amps.

Because we are constantly seeking to improve our products, specifications are subject to change at any time.

Transient Voltage Surge Suppressors By:

AC Distribution Panel Unit — *Model LA-ST300*

Dedicated Protection Components And Circuitry For Each Mode

P.O. Box 330607
Ft. Worth, TX 76163
Phone: 817.483.8497
Fax: 817.572.2242
www.sinetamer.com

"Power Quality is Our Only Business"

The SineTamer© LA series of units blends outstanding high-energy "impulse" suppression with unsurpassed "ring-wave" transient protection Frequency Attenuation Network®. This durable device is intended for general purpose and sensitive/critical load applications. The LA-ST300 is typically installed at service entrances up to 3000 amps, distribution and sub-distribution panels. Compact size and non-metallic enclosure design also allow it to be installed directly inside electrical panels and individual equipment disconnects. The internal installation provides the absolute shortest possible lead length and optimum performance. The LA-ST300 is extremely effective in limiting internally generated transients and is an absolute must on panels feeding office locations and/or microprocessor based equipment.

This economical device has features that are not available in devices costing many times its price. Its compact size makes installation a breeze. **Maintenance Free** operation and **20 Year Unlimited Free Replacement Warranty** provide peace of mind.

GENERAL

Description:	Parallel connected, transient voltage surge suppressor device utilizing both high-energy handling and Frequency Attenuation Network® circuitry for virtual elimination of ring wave type transients. Unit has 300 ka per phase – 100 ka per mode peak surge current.
Application:	Designed for use at ANSI/IEEE Categories C, B and A with susceptibility up to medium exposure levels. Designed to protect sensitive/critical loads fed from distribution panels, branch panels and/or individual equipment panels.
Warranty:	**20 Years Unlimited Free Replacement**
Qualifications:	**Listed to UL1449 2nd Edition (Feb. 9, 2007 Rev.) by CSA, an NRTL, CSA MC#214804, UL1283 and CE Compliant, ISO 9001:2000, ANSI C62.72-2007, IEC 61643-1 (Class 2 & 3)**

MECHANICAL

Enclosure:	High strength ABS Plastic, NEMA 4 rated enclosure.
Mounting:	1" conduit fitting (internally threaded) and external mounting feet.
Connection Method:	#10 stranded wire.
Shipping Weight:	≈ 6 lbs.

ELECTRICAL

Circuit Design:	Parallel connected, internally fused, hybrid design incorporating discrete all mode protection (10 modes for 3 phase wye units*) and utilizing our encapsulated design to provide improved durability. All suppression circuits are encapsulated in our exclusive compound to assure long component life and complete protection from the environment and/or vibration.
Protection Modes:	Dedicated protection components and circuitry for each mode. Discrete L-N, L-L (Normal Mode), and Discrete L-G, N-G (Common Mode). 10 modes / 3 phase wye system.
Input Power Frequency:	50- 60Hz
EMI/RFI Noise Attenuation:	40dB Max. from 1kHz to 10MHz (normal and common mode)
Response Time:	<1 nanosecond
Joules:	8800 (based on industry accepted 10/1000 wave shape testing)
Circuit Diagnostics:	Super Bright LED, 1 per phase, normally on. Dry relay contacts for remote monitoring.
Circuit Interrupt:	External and internal (see installation instructions for details).
Fusing:	Component Level Thermal and Board Level Current Fusing

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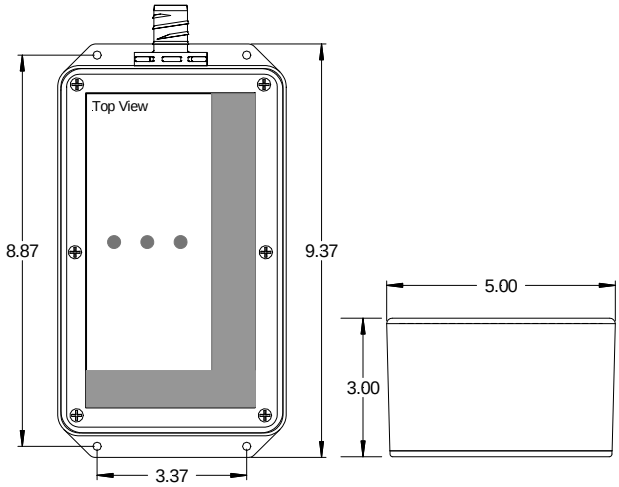

MEASURED LIMITING VOLTAGE PERFORMANCE AND ELECTRICAL SPECIFICATIONS

Model	Circuit Type	MCOV	Peak Surge Current (Amps) Per Mode	Mode	ANSI/IEEE C62.41 & C62.45 Let-Through Voltage Test Results		
					A1 2kV, 67A 100KHz Ring Wave 270º Phase Angle	B3/C1 6kV, 3kA Impulse Wave 90º Phase Angle	C3 20kV, 10kA Impulse Wave 90º Phase Angle
LA-ST300-1P1C	120V, Single Ø (2 wire + ground)	150 L-N 150 L-G 150 N-G	100,000 L-N 100,000 L-G 100,000 N-G 300,000 Total	L-N L-G N-G	45 60 55	385 400 560	914 1025 1176
LA-ST300-1S1C	120/240V, Split Ø (3 wire + ground)	300 L-L 150 L-N 150 L-G 150 N-G	100,000 L-L 100,000 L-N 100,000 L-G 100,000 N-G 600,000 Total	L-L L-N L-G N-G	75 45 60 55	570 385 400 560	1119 914 1025 1176
LA-ST300-3Y1C	120/208V, 3ØY (4 wire + ground)	300 L-L 150 L-N 150 L-G 150 N-G	100,000 L-L 100,000 L-N 100,000 L-G 100,000 N-G 1,000,000 Total	L-L L-N L-G N-G	55 45 60 55	570 385 400 560	1119 914 1025 1176
LA-ST300-1P2C	240V, Single Ø (2 wire + ground)	320 L-N 320 L-G 320 N-G	100,000 L-N 100,000 L-G 100,000 N-G 300,000 Total	L-N L-G N-G	60 80 55	560 590 965	1050 1262 1575
LA-ST300-3Y2C	277/480V, 3ØY 220/380V, 3ØY (4 wire + ground)	550 L-L 320 L-N 320 L-G 320 N-G	100,000 L-L 100,000 L-N 100,000 L-G 100,000 N-G 1,000,000 Total	L-L L-N L-G N-G	130 60 80 55	895 560 590 965	1344 1050 1262 1575
LA-ST300-3N2C	240V, 3∅Δ (3 wire + ground)	320 L-L 320 L-G	100,000 L-L 100,000 L-G 600,000 Total	L-L L-G	60 75	590 590	1262 1262
LA-ST300-3N4C	380V, 3∅Δ 480V, 3∅Δ (3 wire + ground)	550 L-L 550 L-G	100,000 L-L 100,000 L-G 600,000 Total	L-L L-G	60 130	895 895	1344 1344

Let-Through Voltage Test Environment: Positive Polarity. Time base=1ms. All voltages are peak (±10%). Surge voltages are measured from the insertion point of surge on the sine wave to the peak of the surge. All tests are Dynamic (voltage applied) except N-G which is static (no voltage applied). All tests were performed with 6 inches of lead length outside the device enclosure which simulates actual "as installed" performance.

Single-pulse, surge current testing for all modes at rated currents, is in compliance with NEMA LS 1-1992. Single-pulse, surge current capacities of 200,000 amps or less are determined by single-unit testing of all components within each mode. Present industry test equipment limitations require testing of individual components or sub-assemblies within a mode for single-pulse, surge current capacities over 200,000 amps.

Because we are constantly seeking to improve our products, specifications are subject to change at any time.

Transient Voltage Surge Suppressors By:

AC Distribution Panel Unit

Model LA-ST60

Dedicated Protection Components And Sine Wave Tracking Circuitry For Each Mode

"Power Quality is Our Only Business"

P.O. Box 330607
Ft. Worth, TX 76163
Phone: 817.483.8497
Fax: 817.572.2242
www.sinetamer.com

The SineTamer© LA series of units blends outstanding high-energy "impulse" suppression with unsurpassed "ring-wave" transient protection utilizing our Frequency Attenuation Network®. This durable device is intended for general purpose and sensitive/critical load applications. The LA-ST60 is typically installed at small service entrances, distribution and sub-distribution panels. Compact size and non-metallic enclosure design also allow it to be installed directly inside electrical panels and individual equipment disconnects. The internal installation provides the absolute shortest possible lead length and optimum performance. The LA-ST60 is extremely effective in limiting internally generated transients and is an absolute must on panels feeding office locations and/or microprocessor based equipment.

This economical device has features that are not available in devices costing many times its price. Its compact size makes installation a breeze. **Maintenance Free** operation and **20 Year Unlimited Free Replacement Warranty** provide peace of mind.

GENERAL

Description:	Parallel connected, transient voltage surge suppressor device utilizing both high-energy handling and Frequency Attenuation Network® circuitry for virtual elimination of ring wave type transients. Unit has a 20ka per mode/60ka per phase rating.
Application:	Designed for use at ANSI/IEEE Categories C, B and A with susceptibility up to medium exposure levels. Designed to protect sensitive/critical loads fed from distribution panels, branch panels and/or individual equipment panels.
Warranty:	**20 Years Unlimited Free Replacement**
Product Qualifications:	**Listed to UL1449 2nd Edition (Feb. 9, 2007 Rev.) by CSA, an NRTL, CSA MC#214804, UL1283 and CE Compliant, ISO 9001:2000, ANSI C62.72-2007**

MECHANICAL

Enclosure:	High strength ABS Plastic, NEMA 4 rated enclosure.
Mounting:	1" conduit fitting (internally threaded) and external mounting feet.
Connection Method:	#10 stranded wire.
Shipping Weight:	≈ 6lbs

ELECTRICAL

Circuit Design:	Parallel connected, internally fused, hybrid design incorporating discrete all mode protection (10 modes for 3 phase wye units*) and utilizing our encapsulated design to provide improved durability. All suppression circuits are encapsulated in our exclusive compound to assure long component life and complete protection from the environment and/or vibration.
Protection Modes:	Dedicated protection components and circuitry for each mode. Discrete L-N, L-L (Normal Mode), and Discrete L-G, N-G (Common Mode). 10 modes / 3 phase wye system.
Input Power Frequency:	50- 60Hz typical
EMI/RFI Noise Attenuation:	30dB Max. from 1kHz to 10MHz
Circuit Diagnostics:	Super Bright LED, 1 per phase, normally on. Dry relay contacts for remote monitoring.
Circuit Interrupt:	External and internal (see installation instructions for details).
Fusing:	Component Level Thermal and Board Level Current Fusing
kAIC Rating:	200 kAIC when installed according to installation instructions

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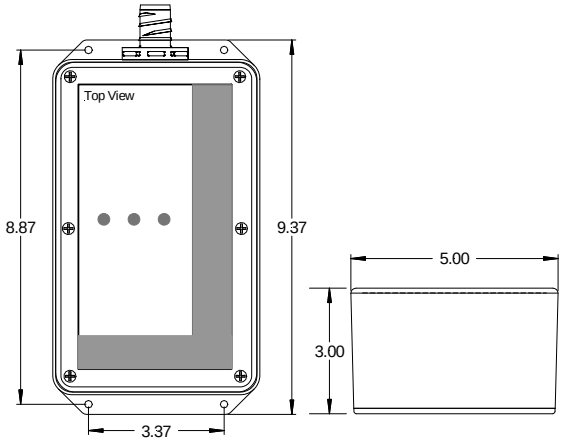


MEASURED LIMITING VOLTAGE PERFORMANCE AND ELECTRICAL SPECIFICATIONS

Model	Circuit Type	MCOV	Peak Surge Current (Amps) Per Mode	Mode	ANSI/IEEE C62.41 & C62.45 Let-Through Voltage Test Results		
					A1 2kV, 67A 100KHz Ring Wave 270º Phase Angle	B3/C1 6kV, 3kA Impulse Wave 90º Phase Angle	C3 20kV, 10kA Impulse Wave 90º Phase Angle
LA-ST60-1P1C	120V, Single Ø (2 wire + ground)	150 L-N 150 L-G 150 N-G	20,000 L-N 20,000 L-G 20,000 N-G 60,000 Total	L-N L-G N-G	45 60 55	385 400 560	914 1025 1176
LA-ST60-1S1C	120/240V, Split Ø (3 wire + ground)	300 L-L 150 L-N 150 L-G 150 N-G	20,000 L-L 20,000 L-N 20,000 L-G 20,000 N-G 120,000 Total	L-L L-N L-G N-G	75 45 60 55	570 385 400 560	1119 914 1025 1176
LA-ST60-3Y1C	120/208V, 3ØY (4 wire + ground)	300 L-L 150 L-N 150 L-G 150 N-G	20,000 L-L 20,000 L-N 20,000 L-G 20,000 N-G 200,000 Total	L-L L-N L-G N-G	55 45 60 55	570 385 400 560	1119 914 1025 1176
LA-ST60-1P2C	240V, Single Ø (2 wire + ground)	320 L-N 320 L-G 320 N-G	20,000 L-N 20,000 L-G 20,000 N-G 60,000 Total	L-N L-G N-G	60 80 55	560 590 965	1050 1262 1575
LA-ST60-3Y2C	220/380V, 3ØY 277/480V, 3ØY (4 wire + ground)	550 L-L 320 L-N 320 L-G 320 N-G	20,000 L-L 20,000 L-N 20,000 L-G 20,000 N-G 200,000 Total	L-L L-N L-G N-G	130 60 80 55	895 560 590 965	1344 1050 1262 1575
LA-ST60-3N2C	240V, 3∅Δ (3 wire + ground)	320 L-L 320 L-G	20,000 L-L 20,000 L-G 120,000 Total	L-L L-G	60 75	590 590	1262 1262
LA-ST60-3N4C	380V, 3∅Δ 480V, 3∅Δ (3 wire + ground)	550 L-L 550 L-G	20,000 L-L 20,000 L-G 120,000 Total	L-L L-G	60 130	895 895	1344 1344
LA-ST60-3N6C	550V, 3∅Δ 660V, 3∅Δ (3 wire + ground)	750 L-L 750 L-G	20,000 L-L 20,000 L-G 120,000 Total	L-L L-G	160 140	1250 1290	1750 1750

Let-Through Voltage Test Environment: Positive Polarity. Time base=1ms. All voltages are peak (±10%). Surge voltages are measured from the insertion point of surge on the sine wave to the peak of the surge. All tests are Dynamic (voltage applied) except N-G which is static (no voltage applied). All tests were performed with 6 inches of lead length outside the device enclosure which simulates actual "as installed" performance.

Single-pulse, surge current testing for all modes at rated currents, is in compliance with NEMA LS 1-1992. Single-pulse, surge current capacities of 200,000 amps or less are determined by single-unit testing of all components within each mode. Present industry test equipment limitations require testing of individual components or sub-assemblies within a mode for single-pulse, surge current capacities over 200,000 amps.

Because we are constantly seeking to improve our products, specifications are subject to change at any time.

Model: *ST-CDLA*

180 kA Per Phase*
with Frequency Attenuation Network®

General

Application: The ST-CDLA series is one of the most versatile and effective devices in our product line. This durable, high performance device is intended for sensitive and critical load applications at main distribution panels, branch panels, motor control centers, and individual equipment disconnects. It is equally effective against externally generated high energy impulses and internally generated switching events

IEEE –C62.41.1 & C62.41.2-2002 environments: Suitable for Categories: A, B & C (Most Severe Electrical Environments)

IEC Environments: Suitable for use in IEC 61643-11 environments

Circuit Topology: Parallel configured combination **Frequency Attenuation Network®** *and* **Optimal Response Circuitry™** circuit design incorporating component-level, thermal fusing and ***Patent Pending*** internal, circuit board mounted, over-current fusing; and discrete ***"All Mode"*** protection (10 modes for 3 phase Wye units). All protection circuits are encapsulated in our high dielectric compound to assure long component life and complete protection from the weather and vibration.

Protection Modes: Industry-best practice of true all mode dedicated protection components for all operational modes of the electrical system. **Discrete L-N, L-L (Normal Mode) and L-G, N-G (Common Mode)** Example: Directly Connected Protection Elements in All 10 modes for a 3 phase, 4 wire, Wye system, (i.e. 3 L-N modes, 3 L-L modes, 3 L-G modes and 1 N-G mode).

Input Power: 50-60 Hz (60 Hz nominal)

Temperature Rating: Up to 80°C

Insertion Loss Data: (L-N)

Frequency:	10 kHz	100 kHz	1 MHz	Max Attenuation & Freq.
Attenuation:	20 dB	47 dB	26 dB	65 dB @ 135 kHz

Standard Enclosure: NEMA 4 Rated with optional free gasket kit (P/N: GA001)
(Other enclosure options available see pg. 2)

Diagnostics: Green LED's, one per phase, normally on. A wide range of optional diagnostics is available (see page two for details).

Circuit Interrupt: Internal component-level, thermal fusing and patent pending, circuit board mounted, over-current fusing.

UL Short Circuit Current Rating: 200 kAIC (UL's Highest Rating)

Product Qualifications:
Listed to UL1449 2nd Edition (Feb. 9, 2007 Rev.) by CSA, an NRTL,
CSA MC#241804, UL1283 and CE Compliant
ISO 9001 Certified Manufacturing Facility, ANSI C62.72-2007

* Based on 3 Phase Wye, 4 Wire and Ground

Key Features

- **Discrete *"All Mode"* Circuitry: Directly Connected Protection Elements in *"All Modes"* (10 modes for 3 phase, 4 wire Wye circuits) as recommend by NEMA LS-1 and IEEE Std. 1100-1999**
- **Industry Leading Measured Limiting Voltage (let-through) Performance**
- **Multi-stage Hybrid Frequency Attenuation Network® Circuitry**
- **Local & Remote Diagnostics**
- **Independent Verification of Performance and Safety**
- **Component-Level, Thermal Fusing**
- **Patent Pending, Internal, Circuit Board Mounted, Over-Current Fusing**
- **Recommended for Panels up to 1800 amps.**

AC Power Panel Units

25 Year Unlimited Free Replacement Warranty

Energy Control Systems, P.O. Box 330607 Ft. Worth, TX 76163 – 817.483.8497 – Fax: 817.572.2242

"Power Quality Is Our Business"

Model	Circuit Type	MCOV	ANSI/IEEE C62.41.1 & C62.41.2 Let-through Voltage Test Results (tested w/6" lead length external to the enclosure per UL 1449)			
			Test Mode	A1 2 kV, 67 A 100 kHz Ring Wave @ 270° Phase Angle	B3/C1 6 kV, 3 kA Impulse Wave @ 90° Phase Angle	C3 20 kV, 10 kA Impulse Wave @ 90° Phase Angle
ST-CDLA1S1	120/240 V 1Ø (Split) (3 wire + ground)	150 V L-N 300 V L-L 150 V L-G 150 V N-G	L-N L-L L-G N-G	35 V 38 V 56 V 55 V	382 V 570 V 397 V 558 V	914 V 1,119 V 1,025 V 1,176 V
ST-CDLA1P2	240V, Single Ø (2 wire + ground)	320 V L-N 320 V L-G 320 V N-G	L-N L-G N-G	51 V 75 V 52 V	558 V 588 V 965 V	1070 V 1262 V 1575 V
ST-CDLA3Y1	120/208 V 3Ø Wye (4 wire + ground)	150 V L-N 300 V L-L 150 V L-G 150 V N-G	L-N L-L L-G N-G	35 V 38 V 56 V 55 V	382 V 570 V 397 V 558 V	914 V 1,119 V 1,025 V 1,176 V
ST-CDLA3Y2	277/480 V 3Ø Wye (4 wire + ground)	320 V L-N 550 V L-L 320 V L-G 320 V N-G	L-N L-L L-G N-G	51 V 126 V 75 V 52 V	558 V 892 V 588 V 965 V	1,050 V 1,344 V 1,262 V 1,575 V
ST-CDLA3N2	240 V 3Ø Delta (NN) (3 wire + ground)	320 V L-L 320 V L-G	L-L L-G	51 V	588 V 588 V	1,262 V 1,262 V
ST-CDLA3N4	480 V 3Ø Delta (NN) (3 wire + ground)	550 V L-L 550 V L-G	L-L L-G	51 V	892 V 878 V	1,344 V 1,344 V

Let-through Voltage Test Parameters: Positive Polarity, All voltages are peak (±10%). All tests are static except 150 V MCOV modes. Let-through voltages on static tests calculated by subtracting sinewave peak from let-through measured from zero. 150 V MCOV mode let-through voltages measured from the insertion point on the sinewave. *(Scope Settings: Time Base = 20 microseconds, Sampling Rate = 250 Megasamples/sec. These settings assure Let-through voltages test results are accurate).* ***All tests performed with 6" lead length (external to the enclosure), simulating actual installed performance.***

Surge Current Testing: Single-pulse surge current testing for all modes at rated currents as recommended by NEMA LS1-1992. Single pulse surge current capacities of 200,000 amps or less are determined by testing all suppression components within each mode as a group. Present industry test equipment limitations require testing of individual suppression components or sub-assemblies within a mode for single-pulse surge capacities over 200,000 amps.

Options

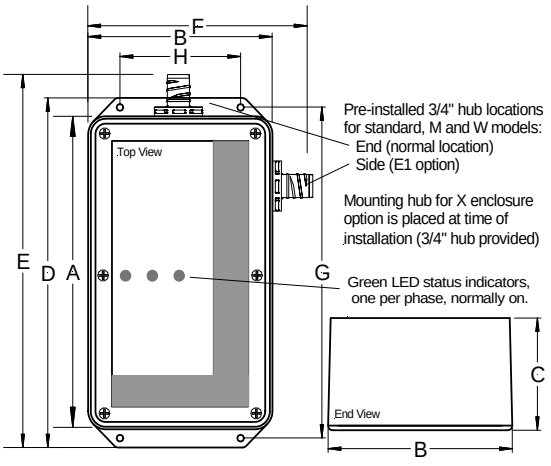
AC = Internal Audible Alarm w/ test button, mute switch and red LED
C = Form C dry relay contacts
D1 = Integral, non-fused disconnect switch (TVSS unit mounts inside)
D2 = External non-fused disconnect switch (TVSS mounts to outside)
D3 = Same as ***D1***, except no external handle
E1 = Hub on side of enclosure
E2 = No hub, wires only exiting from side of enclosure
E3 = No hub, wires only exiting the end of the enclosure
F = Internal, circuit board mounted over-current fuses
LP = Remote LED indicators in individual NEMA 4X housings
M = NEMA 12 Steel Enclosure
N = Removes neutral to ground Sinewave Tracking Circuit
P = Flush Mount Plate
Q = Labeled as a secondary surge arrester - UL category OWHX (Requires "***F*** " option)
R1 = Remote lights on separate circuit board (no enclosure)
R2 = Remote lights on separate circuit board in separate enclosure
S = Surge counter w/ reset button
W = NEMA 4 Steel Enclosure
X = NEMA 4X Composite Fiberglass Enclosure
XS = NEMA 4X Stainless Steel Enclosure

External Accessories: ***EACS*** = Externally mounted diagnostic module, combines ***AC***, ***C***, and ***S*** options
(Also available: ***EAC***, ***EC***, ***ECS***, and ***ES***)

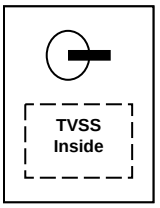
Mechanical

Enclosure Dimensions				
Inches (mm)	Standard Model	Enclosure Options		
		M	W	X
A	***8.25 (210)***	***10.00 (254)***	***10.00 (254)***	***12.00 (305)***
B	***5.00 (127)***	***8.00 (204)***	***8.00 (204)***	***10.50 (267)***
C	***3.00 (77)***	***4.00 (102)***	***4.00 (102)***	***6.00 (153)***
D	9.37 (238)	11.50 (293)	11.50 (293)	12.50 (318)
E	9.48 (242)	12.00 (305)	12.00 (305)	13.00 (331)
F	6.23 (159)	9.00 (229)	9.00 (229)	11.00 (280)
G	8.87 (226)	10.75 (274)	10.75 (274)	12.00 (305)
H	3.37 (86)	6.00 (153)	6.00 (153)	8.00 (204)
Type	***NEMA 4 ABS**	**NEMA 12 Steel**	**NEMA 4 Steel**	**NEMA 4X composite**
lbs (kg)	5 (2.27)	14 (6.36)	14 (6.36)	11 (4.99)

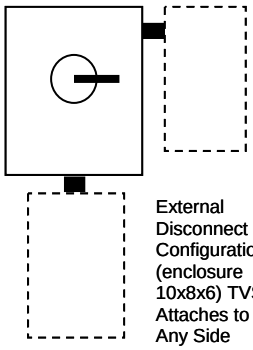
*UL94-5VA ABS Composite.
Flush mount trim plate available for standard and "M" option models.



Circuit Connection: #10 AWG wire (pre-installed)



Integral Disconnect D1, D3 option configuration (Enclosure 12x10x6)



External Disconnect D2 Configuration (enclosure 10x8x6) TVSS Attaches to Any Side

Energy Control Systems
PO Box 330607, Fort Worth, TX 76163
www.sinetamer.com

Model: *ST-CKLA*

120 kA Per Phase with Frequency Attenuation Network®*

General

Application: The ST-CKLA series is one of the most versatile and effective devices in our product line. This durable, high performance device is intended for sensitive and critical load applications at main distribution panels, branch panels, motor control centers, and individual equipment disconnects. It is equally effective against externally generated high energy impulses and internally generated switching events

IEEE –C62.41.1 & C62.41.2-2002 environments: Suitable for Categories: A, B & C (Most Severe Electrical Environments)

IEC Environments: Suitable for use in IEC 61643-11 environments

Circuit Topology: Parallel configured combination **Frequency Attenuation Network®** and **Optimal Response Circuitry™** circuit design incorporating component-level, thermal fusing and ***Patent Pending*** internal, circuit board mounted, over-current fusing; and discrete ***"All Mode"*** protection (10 modes for 3 phase Wye units). All protection circuits are encapsulated in our high dielectric compound to promote long component life and protection from the weather and vibration.

Protection Modes: Industry-best practice of true all mode dedicated protection components for all operational modes of the electrical system. **Discrete L-N, L-L (Normal Mode) and L-G, N-G (Common Mode)** Example: Directly Connected Protection Elements in All 10 modes for a 3 phase, 4 wire, Wye system, (i.e. 3 L-N modes, 3 L-L modes, 3 L-G modes and 1 N-G mode).

Input Power: 50-60 Hz (60 Hz nominal)

Temperature Rating: Up to 80°C

Insertion Loss Data: (L-N)

Frequency:	10 kHz	100 kHz	1 MHz	Max Attenuation & Freq.
Attenuation:	20 dB	47 dB	26 dB	65 dB @ 135 kHz

Standard Enclosure: NEMA 4 Rated with optional free gasket kit (P/N: GA001)
(Other enclosure options available see pg. 2)

Diagnostics: Green LED's, one per phase, normally on. A wide range of optional diagnostics is available (see page two for details).

Circuit Interrupt: Internal component-level, thermal fusing and patent pending, circuit board mounted, over-current fusing.

UL Short Circuit Current Rating: 200 kAIC (UL's Highest Rating)

Product Qualifications:
Listed to UL1449 2nd Edition (Feb. 9, 2007 Rev.) by CSA, an NRTL,
CSA MC#241804, UL1283 and CE Compliant
ISO 9001 Certified Manufacturing Facility
CSA Certified Laboratory for WMTC

* Based on 3 Phase Wye, 4 Wire and Ground

Key Features

- **Discrete *"All Mode"* Circuitry: Directly Connected Protection Elements in *"All Modes"* (10 modes for 3 phase, 4 wire Wye circuits) as recommend by NEMA LS-1 and IEEE Std. 1100-1999**
- **Industry Leading Measured Limiting Voltage (let-through) Performance**
- **Multi-stage Hybrid Frequency Attenuation Network® Circuitry**
- **Local & Remote Diagnostics**
- **Independent Verification of Performance and Safety**
- **Component-Level, Thermal Fusing**
- **Patent Pending, Internal, Circuit Board Mounted, Over-Current Fusing**
- **Recommended for Panels up to 1200 amps.**

AC Power Panel Units

25 Year Unlimited Free Replacement Warranty

Energy Control Systems, P.O. Box 330607 Ft. Worth, TX 76163 – 817.483.8497 – Fax: 817.572.2242

"Power Quality Is Our Business"

Model	Circuit Type	MCOV	ANSI/IEEE C62.41.1 & C62.41.2 Let-through Voltage Test Results (tested w/6" lead length external to the enclosure per UL 1449)			
			Test Mode	A1 2 kV, 67 A 100 kHz Ring Wave @ 270° Phase Angle	B3/C1 6 kV, 3 kA Impulse Wave @ 90° Phase Angle	C3 20 kV, 10 kA Impulse Wave @ 90° Phase Angle
ST-CKLA1S1	120/240 V 1Ø (Split) (3 wire + ground)	150 V L-N 300 V L-L 150 V L-G 150 V N-G	L-N L-L L-G N-G	35 V 38 V 56 V 55 V	382 V 570 V 397 V 558 V	914 V 1,119 V 1,025 V 1,176 V
ST-CKLA1P2	240V, Single Ø (2 wire + ground)	320 V L-N 320 V L-G 320 V N-G	L-N L-G N-G	51 V 75 V 52 V	558 V 588 V 965 V	1070 V 1262 V 1575 V
ST-CKLA3Y1	120/208 V 3Ø Wye (4 wire + ground)	150 V L-N 300 V L-L 150 V L-G 150 V N-G	L-N L-L L-G N-G	35 V 38 V 56 V 55 V	382 V 570 V 397 V 558 V	914 V 1,119 V 1,025 V 1,176 V
ST-CKLA3Y2	277/480 V 3Ø Wye (4 wire + ground)	320 V L-N 550 V L-L 320 V L-G 320 V N-G	L-N L-L L-G N-G	51 V 126 V 75 V 52 V	558 V 892 V 588 V 965 V	1,050 V 1,344 V 1,262 V 1,575 V
ST-CKLA3N2	240 V 3Ø Delta (NN) (3 wire + ground)	320 V L-L 320 V L-G	L-L L-G	51 V	588 V 588 V	1,262 V 1,262 V
ST-CKLA3N4	480 V 3Ø Delta (NN) (3 wire + ground)	550 V L-L 550 V L-G	L-L L-G	51 V	892 V 878 V	1,344 V 1,344 V

Let-through Voltage Test Parameters: Positive Polarity, All voltages are peak (±10%). All tests are static except 150 V MCOV modes. Let-through voltages on static tests calculated by subtracting sinewave peak from let-through measured from zero. 150 V MCOV mode let-through voltages measured from the insertion point on the sinewave. *(Scope Settings: Time Base = 20 microseconds, Sampling Rate = 250 Megasamples/sec. These settings assure Let-through voltages test results are accurate).* ***All tests performed with 6" lead length (external to the enclosure), simulating actual installed performance.***

Surge Current Testing: Single-pulse surge current testing for all modes at rated currents as recommended by NEMA LS1-1992. Single pulse surge current capacities of 200,000 amps or less are determined by testing all suppression components within each mode as a group. Present industry test equipment limitations require testing of individual suppression components or sub-assemblies within a mode for single-pulse surge capacities over 200,000 amps.

Options

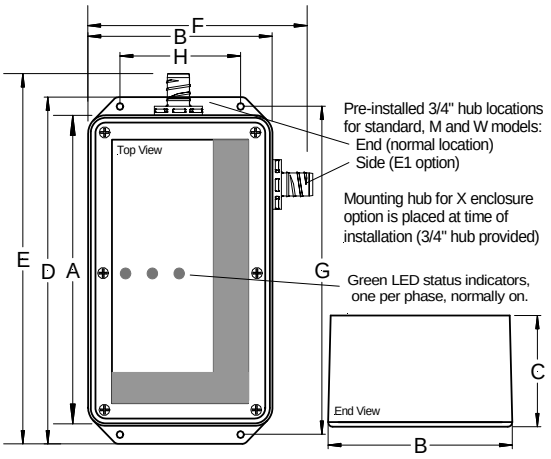
AC = Internal Audible Alarm w/ test button, mute switch and red LED
C = Form C dry relay contacts
D1 = Integral, non-fused disconnect switch (TVSS unit mounts inside)
D2 = External non-fused disconnect switch (TVSS mounts to outside)
D3 = Same as ***D1***, except no external handle
E1 = Hub on side of enclosure
E2 = No hub, wires only exiting from side of enclosure
E3 = No hub, wires only exiting the end of the enclosure
F = Internal, circuit board mounted over-current fuses
LP = Remote LED indicators in individual NEMA 4X housings
M = NEMA 12 Steel Enclosure
N = Removes neutral to ground Sinewave Tracking Circuit
P = Flush Mount Plate
Q = Labeled as a secondary surge arrester - UL category OWHX (Requires "***F*** " option)
R1 = Remote lights on separate circuit board (no enclosure)
R2 = Remote lights on separate circuit board in separate enclosure
S = Surge counter w/ reset button
W = NEMA 4 Steel Enclosure
X = NEMA 4X Composite Fiberglass Enclosure
XS = NEMA 4X Stainless Steel Enclosure

External Accessories: ***EACS*** = Externally mounted diagnostic module, combines ***AC***, ***C***, and ***S*** options
(Also available: ***EAC***, ***EC***, ***ECS***, and ***ES***)

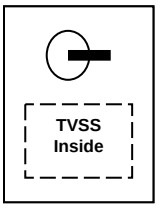
Mechanical

Enclosure Dimensions				
Inches (mm)	Standard Model	Enclosure Options		
		M	W	X
A	***8.25 (210)***	***10.00 (254)***	***10.00 (254)***	***12.00 (305)***
B	***5.00 (127)***	***8.00 (204)***	***8.00 (204)***	***10.50 (267)***
C	***3.00 (77)***	***4.00 (102)***	***4.00 (102)***	***6.00 (153)***
D	9.37 (238)	11.50 (293)	11.50 (293)	12.50 (318)
E	9.48 (242)	12.00 (305)	12.00 (305)	13.00 (331)
F	6.23 (159)	9.00 (229)	9.00 (229)	11.00 (280)
G	8.87 (226)	10.75 (274)	10.75 (274)	12.00 (305)
H	3.37 (86)	6.00 (153)	6.00 (153)	8.00 (204)
Type	***NEMA 4 ABS**	**NEMA 12 Steel**	**NEMA 4 Steel**	**NEMA 4X composite**
lbs (kg)	5 (2.27)	14 (6.36)	14 (6.36)	11 (4.99)

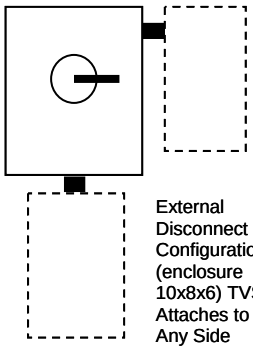
*UL94-5VA ABS Composite.
Flush mount trim plate available for standard and "M" option models.



Circuit Connection: #10 AWG wire (pre-installed)



Integral Disconnect D1, D3 option configuration (Enclosure 12x10x6)



External Disconnect D2 Configuration (enclosure 10x8x6) TVSS Attaches to Any Side

Energy Control Systems
PO Box 330607, Fort Worth, TX 76163
www.sinetamer.com

Model: *ST-CSEA*

240 kA Per Phase*
with Frequency Attenuation Network®

General

Application: The ST-CSEA series is one of the most versatile and effective devices in our product line. This durable, high performance device is intended for sensitive and critical load applications at main distribution panels, branch panels, motor control centers, and individual equipment disconnects. It is equally effective against externally generated high energy impulses and internally generated switching events

IEEE –C62.41.1 & C62.41.2-2002 environments: Suitable for Categories: A, B & C (Most Severe Electrical Environments)

IEC Environments: Suitable for use in IEC 61643-11 environments

Circuit Topology: Parallel configured combination **Frequency Attenuation Network®** *and* **Optimal Response Circuitry™** circuit design incorporating component-level, thermal fusing and ***Patent Pending*** internal, circuit board mounted, over-current fusing; and discrete ***"All Mode"*** protection (10 modes for 3 phase Wye units). All protection circuits are encapsulated in our high dielectric compound to assure long component life and complete protection from the weather and vibration.

Protection Modes: Industry-best practice of true all mode dedicated protection components for all operational modes of the electrical system. **Discrete L-N, L-L (Normal Mode) and L-G, N-G (Common Mode)** Example: Directly Connected Protection Elements in All 10 modes for a 3 phase, 4 wire, Wye system, (i.e. 3 L-N modes, 3 L-L modes, 3 L-G modes and 1 N-G mode).

Input Power: 50-60 Hz (60 Hz nominal)

Temperature Rating: Up to 80°C

Insertion Loss Data: (L-N)

Frequency:	10 kHz	100 kHz	1 MHz	Max Attenuation & Freq.
Attenuation:	20 dB	47 dB	26 dB	65 dB @ 135 kHz

Standard Enclosure: NEMA 4 Rated with optional free gasket kit (P/N: GA001)
(Other enclosure options available see pg. 2)

Diagnostics: Green LED's, one per phase, normally on. A wide range of optional diagnostics is available (see page two for details).

Circuit Interrupt: Internal component-level, thermal fusing and patent pending, circuit board mounted, over-current fusing.

UL Short Circuit Current Rating: 200 kAIC (UL's Highest Rating)

Product Qualifications:
UL Lightning Protection System Certified Component
*Secondary Surge Arrestor (**Q** option), ANSI C62.72-2007*
UL1449 2nd Edition, UL1283, cUL, and CE Compliant
ISO 9001 Certified Manufacturing Facility

* Based on 3 Phase Wye, 4 Wire and Ground

Key Features

- **Discrete *"All Mode"* Circuitry: Directly Connected Protection Elements in *"All Modes"* (10 modes for 3 phase, 4 wire Wye circuits) as recommend by NEMA LS-1 and IEEE Std. 1100-1999**
- **Industry Leading Measured Limiting Voltage (let-through) Performance**
- **Multi-stage Hybrid Frequency Attenuation Network® Circuitry**
- **Local & Remote Diagnostics**
- **Independent Verification of Performance and Safety**
- **Component-Level, Thermal Fusing**
- **Patent Pending, Internal, Circuit Board Mounted, Over-Current Fusing**
- **Recommended for Panels up to 2200 amps.**

AC Power Panel Units

25 Year Unlimited Free Replacement Warranty

Energy Control Systems, P.O. Box 330607 Ft. Worth, TX 76163 – 817.483.8497 – Fax: 817.572.2242

"Power Quality Is Our Business"

Model	Circuit Type	MCOV	ANSI/IEEE C62.41.1 & C62.41.2 Let-through Voltage Test Results (tested w/6" lead length external to the enclosure per UL 1449)			
			Test Mode	A1 2 kV, 67 A 100 kHz Ring Wave @ 270° Phase Angle	B3/C1 6 kV, 3 kA Impulse Wave @ 90° Phase Angle	C3 20 kV, 10 kA Impulse Wave @ 90° Phase Angle
ST-CSEA1S1	120/240 V 1Ø (Split) (3 wire + ground)	150 V L-N 300 V L-L 150 V L-G 150 V N-G	L-N L-L L-G N-G	34 V 38 V 56 V 58 V	382 V 570 V 397 V 558 V	914 V 1,119 V 1,025 V 1,176 V
ST-CSEA1P2	240V, Single Ø (2 wire + ground)	320 V L-N 320 V L-G 320 V N-G	L-N L-G N-G	51 V 75 V 52 V	558 V 588 V 965 V	1070 V 1262 V 1575 V
ST-CSEA3Y1	120/208 V 3Ø Wye (4 wire + ground)	150 V L-N 300 V L-L 150 V L-G 150 V N-G	L-N L-L L-G N-G	35 V 38 V 56 V 55 V	382 V 570 V 397 V 558 V	914 V 1,119 V 1,025 V 1,176 V
ST-CSEA3Y2	277/480 V 3Ø Wye (4 wire + ground)	320 V L-N 550 V L-L 320 V L-G 320 V N-G	L-N L-L L-G N-G	51 V 111 V 75 V 52 V	558 V 892 V 588 V 965 V	1,050 V 1,344 V 1,262 V 1,575 V
ST-CSEA3N2	240 V 3Ø Delta (NN) (3 wire + ground)	320 V L-L 320 V L-G	L-L L-G	50 V	588 V 533 V	1,262 V 1,262 V
ST-CSEA3N4	480 V 3Ø Delta (NN) (3 wire + ground)	550 V L-L 550 V L-G	L-L L-G	50 V	892 V 777 V	1,344 V 1,344 V

Let-through Voltage Test Parameters: Positive Polarity, All voltages are peak (±10%). All tests are static except 150 V MCOV modes. Let-through voltages on static tests calculated by subtracting sinewave peak from let-through measured from zero. 150 V MCOV mode let-through voltages measured from the insertion point on the sinewave. *(Scope Settings: Time Base = 20 microseconds, Sampling Rate = 250 Megasamples/sec. These settings assure Let-through voltages test results are accurate).* ***All tests performed with 6" lead length (external to the enclosure), simulating actual installed performance.***

Surge Current Testing: Single-pulse surge current testing for all modes at rated currents as recommended by NEMA LS1-1992. Single pulse surge current capacities of 200,000 amps or less are determined by testing all suppression components within each mode as a group. Present industry test equipment limitations require testing of individual suppression components or sub-assemblies within a mode for single-pulse surge capacities over 200,000 amps.

Options

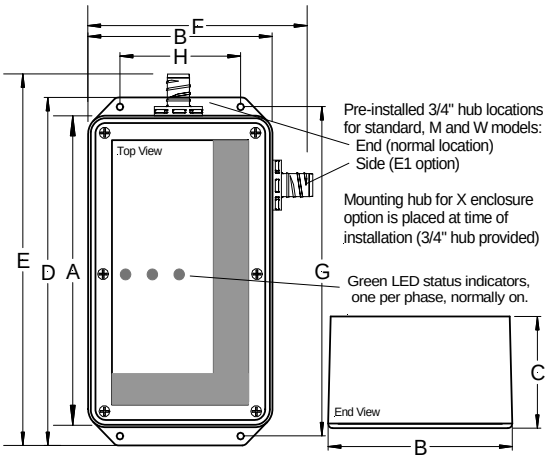
AC = Internal Audible Alarm w/ test button, mute switch and red LED
C = Form C dry relay contacts
D1 = Integral, non-fused disconnect switch (TVSS unit mounts inside)
D2 = External non-fused disconnect switch (TVSS mounts to outside)
D3 = Same as ***D1***, except no external handle
E1 = Hub on side of enclosure
E2 = No hub, wires only exiting from side of enclosure
E3 = No hub, wires only exiting the end of the enclosure
F = Internal, circuit board mounted over-current fuses
LP = Remote LED indicators in individual NEMA 4X housings
M = NEMA 12 Steel Enclosure
N = Removes neutral to ground Sinewave Tracking Circuit
P = Flush Mount Plate
Q = Labeled as a secondary surge arrester - UL category OWHX (Requires "***F*** " option)
R1 = Remote lights on separate circuit board (no enclosure)
R2 = Remote lights on separate circuit board in separate enclosure
S = Surge counter w/ reset button
W = NEMA 4 Steel Enclosure
X = NEMA 4X Composite Fiberglass Enclosure
XS = NEMA 4X Stainless Steel Enclosure

External Accessories: ***EACS*** = Externally mounted diagnostic module, combines ***AC***, ***C***, and ***S*** options
(Also available: ***EAC***, ***EC***, ***ECS***, and ***ES***)

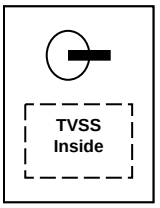
Mechanical

Enclosure Dimensions				
Inches (mm)	Standard Model	Enclosure Options		
		M	W	X
A	***8.25 (210)***	***10.00 (254)***	***10.00 (254)***	***12.00 (305)***
B	***5.00 (127)***	***8.00 (204)***	***8.00 (204)***	***10.50 (267)***
C	***3.00 (77)***	***4.00 (102)***	***4.00 (102)***	***6.00 (153)***
D	9.37 (238)	11.50 (293)	11.50 (293)	12.50 (318)
E	9.48 (242)	12.00 (305)	12.00 (305)	13.00 (331)
F	6.23 (159)	9.00 (229)	9.00 (229)	11.00 (280)
G	8.87 (226)	10.75 (274)	10.75 (274)	12.00 (305)
H	3.37 (86)	6.00 (153)	6.00 (153)	8.00 (204)
Type	***NEMA 4 ABS**	**NEMA 12 Steel**	**NEMA 4 Steel**	**NEMA 4X composite**
lbs (kg)	5 (2.27)	14 (6.36)	14 (6.36)	11 (4.99)

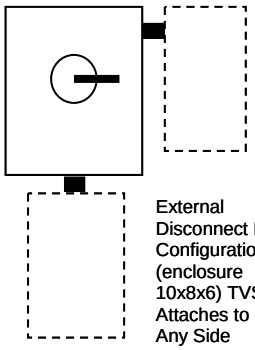
*UL94-5VA ABS Composite.
Flush mount trim plate available for standard and "M" option models.



Circuit Connection: #10 AWG wire (pre-installed)



Integral Disconnect D1, D3 option configuration (Enclosure 12x10x6)



External Disconnect D2 Configuration (enclosure 10x8x6) TVSS Attaches to Any Side

Energy Control Systems
PO Box 330607, Fort Worth, TX 76163
www.sinetamer.com

Model: *ST-CSLA*

90 kA Per Phase*
with Frequency Attenuation Network®

SineTamer
Advantage Series

General

Application: The ST-CSLA series is one of the most versatile and effective devices in our product line. This durable, high performance device is intended for sensitive and critical load applications at main distribution panels, branch panels, motor control centers, and individual equipment disconnects. It is equally effective against externally generated high energy impulses and internally generated switching events

IEEE –C62.41.1 & C62.41.2-2002 environments: Suitable for Categories: A, B & C (Most Severe Electrical Environments)

IEC Environments: Suitable for use in IEC 61643-11 environments

Circuit Topology: Parallel configured combination **Frequency Attenuation Network®** and **Optimal Response Circuitry™** circuit design incorporating component-level, thermal fusing and ***Patent Pending*** internal, circuit board mounted, over-current fusing; and discrete ***"All Mode"*** protection (10 modes for 3 phase Wye units). All protection circuits are encapsulated in our high dielectric compound to promote long component life and protection from the weather and vibration.

Protection Modes: Industry-best practice of true all mode dedicated protection components for all operational modes of the electrical system. **Discrete L-N, L-L (Normal Mode) and L-G, N-G (Common Mode)** Example: Directly Connected Protection Elements in All 10 modes for a 3 phase, 4 wire, Wye system, (i.e. 3 L-N modes, 3 L-L modes, 3 L-G modes and 1 N-G mode).

Input Power: 50-60 Hz (60 Hz nominal)

Temperature Rating: Up to 80°C

Insertion Loss Data: (L-N)

Frequency:	10 kHz	100 kHz	1 MHz	Max Attenuation & Freq.
Attenuation:	20 dB	47 dB	26 dB	65 dB @ 135 kHz

Standard Enclosure: NEMA 4 Rated with optional free gasket kit (P/N: GA001)
(Other enclosure options available see pg. 2)

Diagnostics: Green LED's, one per phase, normally on. A wide range of optional diagnostics is available (see page two for details).

Circuit Interrupt: Internal component-level, thermal fusing and patent pending, circuit board mounted, over-current fusing.

UL Short Circuit Current Rating: 200 kAIC (UL's Highest Rating)

Product Qualifications:
Listed to UL1449 2nd Edition (Feb. 9, 2007 Rev.) by CSA, an NRTL,
CSA MC#241804, UL1283 and CE Compliant
ISO 9001 Certified Manufacturing Facility
CSA Certified Laboratory for WMTC

* Based on 3 Phase Wye, 4 Wire and Ground

Key Features

- **Discrete *"All Mode"* Circuitry: Directly Connected Protection Elements in *"All Modes"* (10 modes for 3 phase, 4 wire Wye circuits) as recommend by NEMA LS-1 and IEEE Std. 1100-1999**
- **Industry Leading Measured Limiting Voltage (let-through) Performance**
- **Multi-stage Hybrid Optimal Sinewave Tracking™ Circuit**
- **Local & Remote Diagnostics**
- **Independent Verification of Performance and Safety**
- **Component-Level, Thermal Fusing**
- **Patent Pending, Internal, Circuit Board Mounted, Over-Current Fusing**
- **Recommended for Panels up to 800 amps.**

AC Power Panel Units

Made in USA

ISO 9001 MANUFACTURER ISO 9001:2000

2004 2006 FROST & SULLIVAN Transient Voltage Surge Suppressors Customer Value Enhancement Award

25 Year Unlimited Free Replacement Warranty

Energy Control Systems, P.O. Box 330607 Ft. Worth, TX 76163 – 817.483.8497 – Fax: 817.572.2242

www.sinetamer.com

"Power Quality Is Our Business"

Model	Circuit Type	MCOV	ANSI/IEEE C62.41.1 & C62.41.2 Let-through Voltage Test Results (tested w/6" lead length external to the enclosure per UL 1449)			
			Test Mode	A1 2 kV, 67 A 100 kHz Ring Wave @ 270° Phase Angle	B3/C1 6 kV, 3 kA Impulse Wave @ 90° Phase Angle	C3 20 kV, 10 kA Impulse Wave @ 90° Phase Angle
ST-CSLA1S1	120/240 V 1Ø (Split) (3 wire + ground)	150 V L-N 300 V L-L 150 V L-G 150 V N-G	L-N L-L L-G N-G	35 V 38 V 56 V 55 V	382 V 570 V 397 V 558 V	914 V 1,119 V 1,025 V 1,176 V
ST-CSLA1P2	240V, Single Ø (2 wire + ground)	320 V L-N 320 V L-G 320 V N-G	L-N L-G N-G	51 V 75 V 52 V	558 V 588 V 965 V	1070 V 1262 V 1575 V
ST-CSLA3Y1	120/208 V 3Ø Wye (4 wire + ground)	150 V L-N 300 V L-L 150 V L-G 150 V N-G	L-N L-L L-G N-G	35 V 38 V 56 V 55 V	382 V 570 V 397 V 558 V	914 V 1,119 V 1,025 V 1,176 V
ST-CSLA3Y2	277/480 V 3Ø Wye (4 wire + ground)	320 V L-N 550 V L-L 320 V L-G 320 V N-G	L-N L-L L-G N-G	51 V 126 V 75 V 52 V	558 V 892 V 588 V 965 V	1,050 V 1,344 V 1,262 V 1,575 V
ST-CSLA3N2	240 V 3Ø Delta (NN) (3 wire + ground)	320 V L-L 320 V L-G	L-L L-G	51 V	588 V 588 V	1,262 V 1,262 V
ST-CSLA3N4	480 V 3Ø Delta (NN) (3 wire + ground)	550 V L-L 550 V L-G	L-L L-G	51 V	892 V 878 V	1,344 V 1,344 V

Let-through Voltage Test Parameters: Positive Polarity, All voltages are peak (±10%). All tests are static except 150 V MCOV modes. Let-through voltages on static tests calculated by subtracting sinewave peak from let-through measured from zero. 150 V MCOV mode let-through voltages measured from the insertion point on the sinewave. *(Scope Settings: Time Base = 20 microseconds, Sampling Rate = 250 Megasamples/sec. These settings assure Let-through voltages test results are accurate).* ***All tests performed with 6" lead length (external to the enclosure), simulating actual installed performance.***

Surge Current Testing: Single-pulse surge current testing for all modes at rated currents as recommended by NEMA LS1-1992. Single pulse surge current capacities of 200,000 amps or less are determined by testing all suppression components within each mode as a group. Present industry test equipment limitations require testing of individual suppression components or sub-assemblies within a mode for single-pulse surge capacities over 200,000 amps.

Options

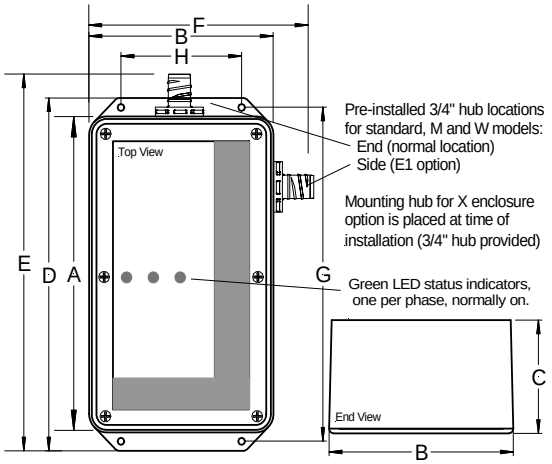
AC = Internal Audible Alarm w/ test button, mute switch and red LED
C = Form C dry relay contacts
D1 = Integral, non-fused disconnect switch (TVSS unit mounts inside)
D2 = External non-fused disconnect switch (TVSS mounts to outside)
D3 = Same as ***D1***, except no external handle
E1 = Hub on side of enclosure
E2 = No hub, wires only exiting from side of enclosure
E3 = No hub, wires only exiting the end of the enclosure
F = Internal, circuit board mounted over-current fuses
LP = Remote LED indicators in individual NEMA 4X housings
M = NEMA 12 Steel Enclosure
N = Removes neutral to ground Sinewave Tracking Circuit
P = Flush Mount Plate
Q = Labeled as a secondary surge arrester - UL category OWHX (Requires "***F*** " option)
R1 = Remote lights on separate circuit board (no enclosure)
R2 = Remote lights on separate circuit board in separate enclosure
S = Surge counter w/ reset button
W = NEMA 4 Steel Enclosure
X = NEMA 4X Composite Fiberglass Enclosure
XS = NEMA 4X Stainless Steel Enclosure

External Accessories: ***EACS*** = Externally mounted diagnostic module, combines ***AC***, ***C***, and ***S*** options
(Also available: ***EAC***, ***EC***, ***ECS***, and ***ES***)

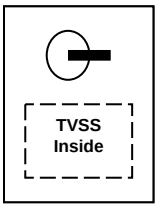
Mechanical

Enclosure Dimensions				
Inches (mm)	Standard Model	Enclosure Options		
		M	W	X
A	***8.25 (210)***	***10.00 (254)***	***10.00 (254)***	***12.00 (305)***
B	***5.00 (127)***	***8.00 (204)***	***8.00 (204)***	***10.50 (267)***
C	***3.00 (77)***	***4.00 (102)***	***4.00 (102)***	***6.00 (153)***
D	9.37 (238)	11.50 (293)	11.50 (293)	12.50 (318)
E	9.48 (242)	12.00 (305)	12.00 (305)	13.00 (331)
F	6.23 (159)	9.00 (229)	9.00 (229)	11.00 (280)
G	8.87 (226)	10.75 (274)	10.75 (274)	12.00 (305)
H	3.37 (86)	6.00 (153)	6.00 (153)	8.00 (204)
Type	***NEMA 4 ABS**	**NEMA 12 Steel**	**NEMA 4 Steel**	**NEMA 4X composite**
lbs (kg)	5 (2.27)	14 (6.36)	14 (6.36)	11 (4.99)

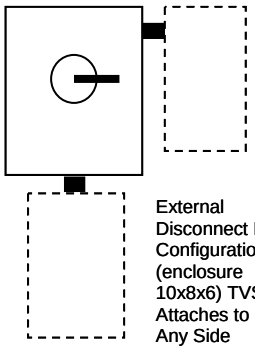
*UL94-5VA ABS Composite.
Flush mount trim plate available for standard and "M" option models.



Circuit Connection: #10 AWG wire (pre-installed)



Integral Disconnect D1, D3 option configuration (Enclosure 12x10x6)



External Disconnect D2 Configuration (enclosure 10x8x6) TVSS Attaches to Any Side

Energy Control Systems

PO Box 330607, Fort Worth, TX 76163
www.sinetamer.com

SineTamer
Advantage Series

Model: *ST-LSEA*

*240 kA Per Phase**

* Based on 3 Phase Wye, 4 Wire and Ground

General

Application: The ST-LSEA series is one of the most versatile units in our product line. This fixed clamping type device is intended for general load applications at locations ranging from individual equipment disconnects to service entrances. It is extremely effective in limiting internally generated transients when used on lighting or HVAC panels.

IEEE –C62.41.1 & C62.41.2-2002 environments: Suitable for Categories: A, B & C (Most Severe Electrical Environments)

IEC Environments: Suitable for use in IEC 61643-11 environments

Circuit Topology: Parallel configured **Optimal Response Circuitry™** circuit design incorporating component-level, thermal fusing and ***Patent Pending*** internal, circuit board mounted, over-current fusing; and discrete ***"All Mode"*** protection (10 modes for 3 phase Wye units). All protection circuits are encapsulated in our high dielectric compound to assure long component life and complete protection from the weather and vibration.

Protection Modes: Industry-best practice of true all mode dedicated protection components for all operational modes of the electrical system. **Discrete L-N, L-L (Normal Mode) and L-G, N-G (Common Mode)** Example: Directly Connected Protection Elements in All 10 modes for a 3 phase, 4 wire, Wye system, (i.e. 3 L-N modes, 3 L-L modes, 3 L-G modes and 1 N-G mode).

Input Power: 50-400 Hz (60 Hz nominal)

Temperature Rating: Up to 80°C

Response Time: ≤ 1 ns

Standard Enclosure: NEMA 4 Rated with optional free gasket kit (P/N: GA001)
(Other enclosure options available see pg. 2)

Diagnostics: Green LED's, one per phase, normally on. A wide range of optional diagnostics is available (see page two for details).

Circuit Interrupt: Internal component-level, thermal fusing and patent pending, circuit board mounted, over-current fusing.

UL Short Circuit Current Rating: 200 kAIC (UL's Highest Rating)

Product Qualifications:
Listed to UL1449 2nd Edition (Feb. 9, 2007 Rev.) by CSA, an NRTL,
CSA MC#241804, UL1283 and CE Compliant
ISO 9001 Certified Manufacturing Facility
CSA Certified Laboratory for WMTC

Key Features

- **Discrete *"All Mode"* Circuitry: Directly Connected Protection Elements in *"All Modes"* (10 modes for 3 phase, 4 wire Wye circuits) as recommend by NEMA LS-1 and IEEE Std. 1100-1999**
- **Industry Leading Measured Limiting Voltage (let-through) Performance**
- **UL 1283 Listed EMI/RFI Parallel Configured Optimal Response Circuitry™**
- **Local & Remote Diagnostics**
- **Independent Verification of Performance and Safety**
- **Component-Level, Thermal Fusing**
- **Patent Pending, Internal, Circuit Board Mounted, Over-Current Fusing**
- **Recommended for Panels up to 2200 amps.**

AC Power Panel Units

Made in USA

ISO 9001 MANUFACTURER ISO 9001:2000

2004 2006 FROST & SULLIVAN Transient Voltage Surge Suppressors Customer Value Enhancement Award

25 Year Unlimited Free Replacement Warranty

Energy Control Systems, P.O. Box 330607 Ft. Worth, TX 76163 – 817.483.8497 – Fax: 817.572.2242

"Power Quality Is Our Business"

Model	Circuit Type	MCOV	ANSI/IEEE C62.41.1 & C62.41.2 Let-through Voltage Test Results (tested w/6" lead length external to the enclosure per UL 1449)			
			Test Mode	A3 6 kV, 200 A 100 kHz Ring Wave @ 90° Phase Angle	B3/C1 6 kV, 3 kA Impulse Wave @ 90° Phase Angle	C3 20 kV, 10 kA Impulse Wave @ 90° Phase Angle
ST-LSEA1S1	120/240 V 1Ø (Split) (3 wire + ground)	150 V L-N 300 V L-L 150 V L-G 150 V N-G	L-N L-L L-G N-G	289 V 436 V 296 V 570 V	393 V 543 V 364 V 668 V	938 V 1,153 V 824 V 860 V
ST-LSEA1P2	240V, Single Ø (2 wire + ground)	320 L-N 320 L-G 320 N-G	L-N L-G N-G	450 V 450 V 940 V	588 V 588 V 1045 V	1070 V 1029 V 1320 V
ST-LSEA3Y1	120/208 V 3Ø Wye (4 wire + ground)	150 V L-N 300 V L-L 150 V L-G 150 V N-G	L-N L-L L-G N-G	296 V 473 V 297 V 578 V	401 V 593 V 402 V 655 V	914 V 1,119 V 1,025 V 1,176 V
ST-LSEA3Y2	277/480 V 3Ø Wye (4 wire + ground)	320 V L-N 550 V L-L 320 V L-G 320 V N-G	L-N L-L L-G N-G	410 V 686 V 420 V 806 V	529 V 777 V 533 V 1025 V	1,050 V 1,344 V 1,262 V 1,575 V
ST-LSEA3N2	240 V 3Ø Delta (NN) (3 wire + ground)	320 V L-L 320 V L-G	L-L L-G	420 V 420 V	533 V 533 V	1,262 V 1,262 V
ST-LSEA3N4	480 V 3Ø Delta (NN) (3 wire + ground)	550 V L-L 550 V L-G	L-L L-G	686 V 686 V	777 V 777 V	1,344 V 1,344 V
ST-LSEA3N6	600V, 3∅Δ (3 wire + ground)	750 L-L 750 L-G	L-L L-G	885 V 885 V	900 V 900 V	1630 V 1630 V

Let-through Voltage Test Parameters: Positive Polarity, All voltages are peak (±10%). All tests are static except 150 V MCOV modes. Let-through voltages on static tests calculated by subtracting sinewave peak from let-through measured from zero. 150 V MCOV mode let-through voltages measured from the insertion point on the sinewave. *(Scope Settings: Time Base = 20 microseconds, Sampling Rate = 250 Megasamples/sec. These settings assure Let-through voltages test results are accurate).* ***All tests performed with 6" lead length (external to the enclosure), simulating actual installed performance.***

Options

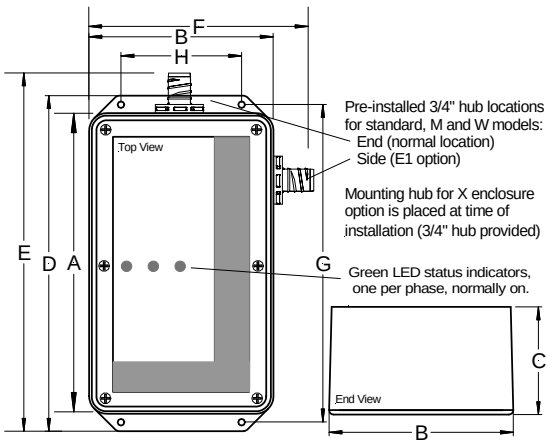
AC = Internal Audible Alarm w/ test button, mute switch and red LED
C = Form C dry relay contacts
D1 = Integral, non-fused disconnect switch (TVSS unit mounts inside)
D2 = External non-fused disconnect switch (TVSS mounts to outside)
D3 = Same as ***D1***, except no external handle
E1 = Hub on side of enclosure
E2 = No hub, wires only exiting from side of enclosure
E3 = No hub, wires only exiting the end of the enclosure
F = Internal, circuit board mounted over-current fuses
G = Removes the EMI/RFI capacitors from the suppressor (Available for non-sinewave tracking units only)
LP = Remote LED indicators in individual NEMA 4X housings
M = NEMA 12 Steel Enclosure
P = Flush Mount Plate
Q = Labeled as a secondary surge arrester - UL category OWHX (Requires F option)
R1 = Remote lights on separate circuit board (board only – no enclosure)
R2 = Remote lights on separate circuit board in separate enclosure
S = Surge counter w/ reset button
W = NEMA 4 Steel Enclosure
X = NEMA 4X Composite Fiberglass Enclosure
XS = NEMA 4X Stainless Steel Enclosure

External Accessories: ***EACS*** = Externally mounted diagnostic module, combines ***AC***, ***C***, and ***S*** options
(Also available: ***EAC***, ***EC***, ***ECS***, and ***ES***)

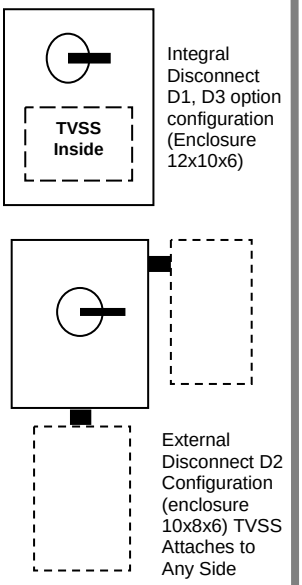
Mechanical

Enclosure Dimensions				
Inches (mm)	Standard Model	Enclosure Options		
		M	W	X
A	***8.25 (210)***	***10.00 (254)***	***10.00 (254)***	***12.00 (305)***
B	***5.00 (127)***	***8.00 (204)***	***8.00 (204)***	***10.50 (267)***
C	***3.00 (77)***	***4.00 (102)***	***4.00 (102)***	***6.00 (153)***
D	9.37 (238)	11.50 (293)	11.50 (293)	12.50 (318)
E	9.48 (242)	12.00 (305)	12.00 (305)	13.00 (331)
F	6.23 (159)	9.00 (229)	9.00 (229)	11.00 (280)
G	8.87 (226)	10.75 (274)	10.75 (274)	12.00 (305)
H	3.37 (86)	6.00 (153)	6.00 (153)	8.00 (204)
Type	***NEMA 4 ABS**	**NEMA 12 Steel**	**NEMA 4 Steel**	**NEMA 4X composite**
lbs (kg)	5 (2.27)	14 (6.36)	14 (6.36)	11 (4.99)

*UL94-5VA ABS Composite.
Flush mount trim plate available for standard and "M" option models.



Circuit Connection: #10 AWG wire (pre-installed)



Integral Disconnect D1, D3 option configuration (Enclosure 12x10x6)

External Disconnect D2 Configuration (enclosure 10x8x6) TVSS Attaches to Any Side

Energy Control Systems
817.483.8497
PO Box 330607, Fort Worth, TX 76163
www.sinetamer.com

SineTamer
Advantage Series

Model: *ST-SDLA*

*180 kA Per Phase**

General

Application: The ST-SDLA series is one of the most versatile units in our product line. This fixed clamping type device is intended for general load applications at locations ranging from individual equipment disconnects to small service entrances. It is extremely effective in limiting internally generated transients when used on lighting or HVAC panels.

IEEE –C62.41.1 & C62.41.2-2002 environments: Suitable for Categories: A, B & C (Most Severe Electrical Environments)

IEC Environments: Suitable for use in IEC 61643-11 environments

Circuit Topology: Parallel configured **Optimal Response Circuitry™** circuit design incorporating component-level, thermal fusing and ***Patent Pending*** internal, circuit board, mounted over-current fusing; and discrete ***"All Mode"*** protection (10 modes for 3 phase Wye units). All protection circuits are encapsulated in our high dielectric compound to assure long component life and complete protection from the weather and vibration.

Protection Modes: Industry-best practice of true all mode dedicated protection components for all operational modes of the electrical system. **Discrete L-N, L-L (Normal Mode) and L-G, N-G (Common Mode)** Example: Directly Connected Protection Elements in All 10 modes for a 3 phase, 4 wire, Wye system, (i.e. 3 L-N modes, 3 L-L modes, 3 L-G modes and 1 N-G mode).

Input Power: 50-400 Hz (60 Hz nominal)

Temperature Rating: Up to 80°C

Response Time: ≤ 1 ns

Joules: 8800 based on 10/1000 industry standard test

Standard Enclosure: NEMA 4 Rated with optional free gasket kit (P/N: GA001)
(Other enclosure options available see pg. 2)

Diagnostics: Green LED's, one per phase, normally on. A wide range of optional diagnostics is available (see page two for details).

Circuit Interrupt: Internal component-level, thermal fusing and patent-pending, circuit board mounted, over-current fusing.

UL Short Circuit Current Rating: 200 kAIC (UL's Highest Rating)

Product Qualifications:
ISO 9001 Certified Manufacturing Facility
Listed to UL1449 2nd Edition (Feb. 9, 2007 Rev.) by CSA, an NRTL, CSA MC#241804, UL1283 and CE Compliant

* Based on 3 Phase Wye, 4 Wire and Ground

Key Features

- **Discrete *"All Mode"* Circuitry: Directly Connected Protection Elements in *"All Modes"* (10 modes for 3 phase, 4 wire Wye circuits) as recommend by NEMA LS-1 and IEEE Std. 1100-1999**
- **Industry Leading Measured Limiting Voltage (let-through) Performance**
- **UL 1283 Listed EMI/RFI Parallel Configured Optimal Response Circuitry™**
- **Local & Remote Diagnostics**
- **Independent Verification of Performance and Safety**
- **Component-Level, Thermal Fusing**
- **Patent Pending, Internal, Circuit Board Mounted, Over-Current Fusing**
- **Recommended for Panels up to 1800 amps.**

AC Power Panel Units

Made in USA

ISO 9001 MANUFACTURER ISO 9001:2000

2004 2006 FROST & SULLIVAN Transient Voltage Surge Suppressors Customer Value Enhancement Award

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ST-SDLA1P2	240V, Single Ø (2 wire + ground)	320 L-N 320 L-G 320 N-G	L-N L-G N-G	450 V 450 V 940 V	588 V 588 V 1045 V	1070 V 1029 V 1320 V
ST-SDLA3Y1	120/208 V 3Ø Wye (4 wire + ground)	150 V L-N 300 V L-L 150 V L-G 150 V N-G	L-N L-L L-G N-G	296 V 473 V 297 V 578 V	401 V 593 V 402 V 655 V	914 V 1,119 V 1,025 V 1,176 V
ST-SDLA3Y2	220/380 - 277/480 V 3Ø Wye (4 wire + ground)	320 V L-N 550 V L-L 320 V L-G 320 V N-G	L-N L-L L-G N-G	443 V 721 V 450 V 942 V	604 V 878 V 588 V 1045 V	1,050 V 1,344 V 1,262 V 1,575 V
ST-SDLA3N2	240 V 3Ø Delta (NN) (3 wire + ground)	320 V L-L 320 V L-G	L-L L-G	450 V 450 V	588 V 588 V	1,262 V 1,262 V
ST-SDLA3N4	480 V 3Ø Delta (NN) (3 wire + ground)	550 V L-L 550 V L-G	L-L L-G	721 V 721 V	878 V 878 V	1,344 V 1,344 V
ST-SDLA3N6	600V, 3∅Δ (3 wire + ground)	750 L-L 750 L-G	L-L L-G	885 V 885 V	900 V 900 V	1630 V 1630 V

Let-through Voltage Test Parameters: Positive Polarity, All voltages are peak (±10%). All tests are static except 150 V MCOV modes. Let-through voltages on static tests calculated by subtracting sinewave peak from let-through measured from zero. 150 V MCOV mode let-through voltages measured from the insertion point on the sinewave. *(Scope Settings: Time Base = 20 microseconds, Sampling Rate = 250 Megasamples/sec. These settings assure Let-through voltages test results are accurate).* ***All tests performed with 6" lead length (external to the enclosure), simulating actual installed performance.***

Options

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F = Internal, circuit board mounted over-current fuses
G = Removes the EMI/RFI capacitors from the suppressor (Available for non-sinewave tracking units only)
LP = Remote LED indicators in individual NEMA 4X housings
M = NEMA 12 Steel Enclosure
P = Flush Mount Plate
Q = Labeled as a secondary surge arrester - UL category OWHX (Requires F option)
R1 = Remote lights on separate circuit board (board only – no enclosure)
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XS = NEMA 4X Stainless Steel Enclosure

External Accessories: ***EACS*** = Externally mounted diagnostic module, combines ***AC***, ***C***, and ***S*** options
(Also available: ***EAC***, ***EC***, ***ECS***, and ***ES***)

Mechanical

Enclosure Dimensions				
Inches (mm)	Standard Model	Enclosure Options		
		M	W	X
A	***8.25 (210)***	***10.00 (254)***	***10.00 (254)***	***12.00 (305)***
B	***5.00 (127)***	***8.00 (204)***	***8.00 (204)***	***10.50 (267)***
C	***3.00 (77)***	***4.00 (102)***	***4.00 (102)***	***6.00 (153)***
D	9.37 (238)	11.50 (293)	11.50 (293)	12.50 (318)
E	9.48 (242)	12.00 (305)	12.00 (305)	13.00 (331)
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G	8.87 (226)	10.75 (274)	10.75 (274)	12.00 (305)
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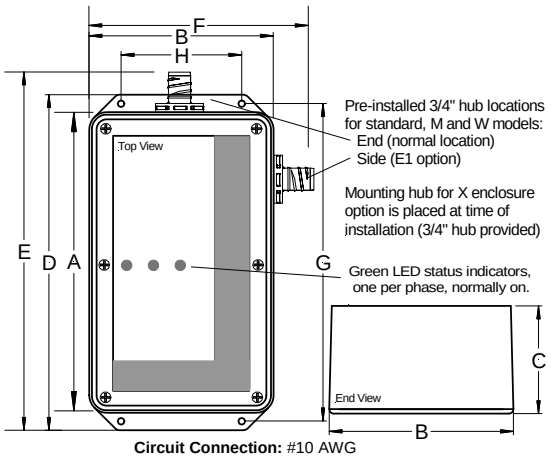
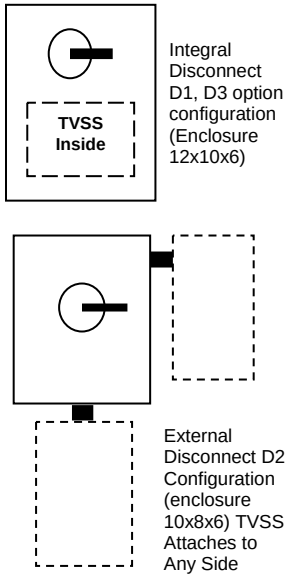
Type	***NEMA 4 ABS**	**NEMA 12 Steel**	**NEMA 4 Steel**	**NEMA 4X composite**
lbs (kg)	5 (2.27)	14 (6.36)	14 (6.36)	11 (4.99)

*UL94-5VA ABS Composite.
Flush mount trim plate available for standard and "M" option models.



Circuit Connection: #10 AWG wire (pre-installed)



Integral Disconnect D1, D3 option configuration (Enclosure 12x10x6)

External Disconnect D2 Configuration (enclosure 10x8x6) TVSS Attaches to Any Side

Energy Control Systems
817.483.8497
PO Box 330607, Fort Worth, TX 76163
www.sinetamer.com

SineTamer
Advantage Series

Model: *ST-SKLA*

*120 kA Per Phase**

General

Application: The ST-SKLA series is one of the most versatile units in our product line. This fixed clamping type device is intended for general load applications at locations ranging from individual equipment disconnects to small service entrances. It is extremely effective in limiting internally generated transients when used on lighting or HVAC panels.

IEEE –C62.41.1 & C62.41.2-2002 environments: Suitable for Categories: A, B & C (Most Severe Electrical Environments)

IEC Environments: Suitable for use in IEC 61643-11 environments

Circuit Topology: Parallel configured **Optimal Response Circuitry™** circuit design incorporating component-level, thermal fusing and ***Patent Pending*** internal, circuit board mounted, over-current fusing; and discrete ***"All Mode"*** protection (10 modes for 3 phase Wye units). All protection circuits are encapsulated in our high dielectric compound to assure long component life and complete protection from the weather and vibration.

Protection Modes: Industry-best practice of true all mode dedicated protection components for all operational modes of the electrical system. **Discrete L-N, L-L (Normal Mode) and L-G, N-G (Common Mode)** Example: Directly Connected Protection Elements in All 10 modes for a 3 phase, 4 wire, Wye system, (i.e. 3 L-N modes, 3 L-L modes, 3 L-G modes and 1 N-G mode).

Input Power: 50-400 Hz (60 Hz nominal)

Temperature Rating: Up to 80°C

Response Time: ≤ 1 ns

Standard Enclosure: NEMA 4 Rated with optional free gasket kit (P/N: GA001)
(Other enclosure options available see pg. 2)

Diagnostics: Green LED's, one per phase, normally on. A wide range of optional diagnostics is available (see page two for details).

Circuit Interrupt: Internal component-level, thermal fusing and patent pending, circuit board mounted, over-current fusing.

UL Short Circuit Current Rating: 200 kAIC (UL's Highest Rating)

Product Qualifications:
Listed to UL1449 2nd Edition (Feb. 9, 2007 Rev.) by CSA, an NRTL,
CSA MC#241804, UL1283 and CE Compliant
ISO 9001 Certified Manufacturing Facility
CSA Certified Laboratory for WMTC

* Based on 3 Phase Wye, 4 Wire and Ground

Key Features

- **Discrete *"All Mode"* Circuitry: Directly Connected Protection Elements in *"All Modes"* (10 modes for 3 phase, 4 wire Wye circuits) as recommend by NEMA LS-1 and IEEE Std. 1100-1999**
- **Industry Leading Measured Limiting Voltage (let-through) Performance**
- **UL 1283 Listed EMI/RFI Parallel Configured Optimal Response Circuitry™**
- **Local & Remote Diagnostics**
- **Independent Verification of Performance and Safety**
- **Component-Level, Thermal Fusing**
- **Patent Pending, Internal, Circuit Board Mounted, Over-Current Fusing**
- **Recommended for Panels up to 1200 amps.**

AC Power Panel Units

Made in USA

ISO 9001 MANUFACTURER ISO 9001:2000

2004 2006 FROST & SULLIVAN Transient Voltage Surge Suppressors Customer Value Enhancement Award

25 Year Unlimited Free Replacement Warranty

Energy Control Systems, P.O. Box 330607 Ft. Worth, TX 76163 – 817.483.8497 – Fax: 817.572.2242

"Power Quality Is Our Business"

Model	Circuit Type	MCOV	ANSI/IEEE C62.41.1 & C62.41.2 Let-through Voltage Test Results (tested w/6" lead length external to the enclosure per UL 1449)			
			Test Mode	A3 6 kV, 200 A 100 kHz Ring Wave @ 90° Phase Angle	B3/C1 6 kV, 3 kA Impulse Wave @ 90° Phase Angle	C3 20 kV, 10 kA Impulse Wave @ 90° Phase Angle
ST-SKLA1S1	120/240 V 1Ø (Split) (3 wire + ground)	150 V L-N 300 V L-L 150 V L-G 150 V N-G	L-N L-L L-G N-G	296 V 473 V 297 V 578 V	401 V 593 V 402 V 655 V	938 V 1,153 V 824 V 860 V
ST- SKLA1P2	240V, Single Ø (2 wire + ground)	320 L-N 320 L-G 320 N-G	L-N L-G N-G	450 V 450 V 940 V	588 V 588 V 1045 V	1070 V 1029 V 1320 V
ST-SKLA3Y1	120/208 V 3Ø Wye (4 wire + ground)	150 V L-N 300 V L-L 150 V L-G 150 V N-G	L-N L-L L-G N-G	296 V 473 V 297 V 578 V	401 V 593 V 402 V 655 V	914 V 1,119 V 1,025 V 1,176 V
ST-SKLA3Y2	220/380 - 277/480 V 3Ø Wye (4 wire + ground)	320 V L-N 550 V L-L 320 V L-G 320 V N-G	L-N L-L L-G N-G	443 V 721 V 450 V 942 V	604 V 878 V 588 V 1045 V	1,050 V 1,344 V 1,262 V 1,575 V
ST-SKLA3N2	240 V 3Ø Delta (NN) (3 wire + ground)	320 V L-L 320 V L-G	L-L L-G	450 V 450 V	588 V 588 V	1,262 V 1,262 V
ST-SKLA3N4	380V & 480V 3Ø Delta (NN) (3 wire + ground)	550 V L-L 550 V L-G	L-L L-G	721 V 721 V	878 V 878 V	1,344 V 1,344 V

Let-through Voltage Test Parameters: Positive Polarity, All voltages are peak (±10%). All tests are static except 150 V MCOV modes. Let-through voltages on static tests calculated by subtracting sinewave peak from let-through measured from zero. 150 V MCOV mode let-through voltages measured from the insertion point on the sinewave. *(Scope Settings: Time Base = 20 microseconds, Sampling Rate = 250 Megasamples/sec. These settings assure Let-through voltages test results are accurate).* ***All tests performed with 6" lead length (external to the enclosure), simulating actual installed performance.***

Surge Current Testing: Single-pulse surge current testing for all modes at rated currents as recommended by NEMA LS1-1992. Single pulse surge current capacities of 200,000 amps or less are determined by testing all suppression components within each mode as a group. Present industry test equipment limitations require testing of individual suppression components or sub-assemblies within a mode for single-pulse surge capacities over 200,000 amps.

Options

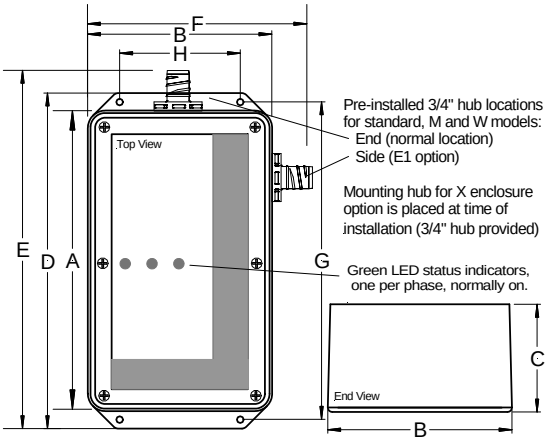
AC = Internal Audible Alarm w/ test button, mute switch and red LED
C = Form C dry relay contacts
D1 = Integral, non-fused disconnect switch (TVSS unit mounts inside)
D2 = External non-fused disconnect switch (TVSS mounts to outside)
D3 = Same as ***D1***, except no external handle
E1 = Hub on side of enclosure
E2 = No hub, wires only exiting from side of enclosure
E3 = No hub, wires only exiting the end of the enclosure
F = Internal, circuit board mounted over-current fuses
G = Removes the EMI/RFI capacitors from the suppressor (Available for non-sinewave tracking units only)
LP = Remote LED indicators in individual NEMA 4X housings
M = NEMA 12 Steel Enclosure
P = Flush Mount Plate
Q = Labeled as a secondary surge arrester - UL category OWHX (Requires F option)
R1 = Remote lights on separate circuit board (board only – no enclosure)
R2 = Remote lights on separate circuit board in separate enclosure
S = Surge counter w/ reset button
W = NEMA 4 Steel Enclosure
X = NEMA 4X Composite Fiberglass Enclosure
XS = NEMA 4X Stainless Steel Enclosure

External Accessories: ***EACS*** = Externally mounted diagnostic module, combines ***AC***, ***C***, and ***S*** options
(Also available: ***EAC***, ***EC***, ***ECS***, and ***ES***)

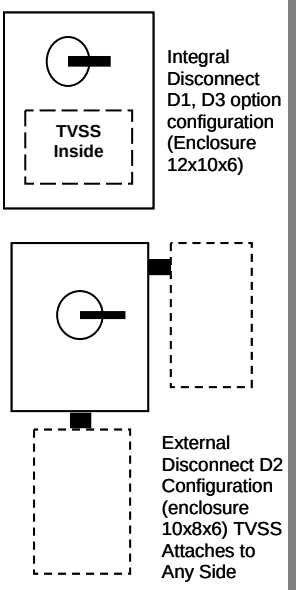
Mechanical

Enclosure Dimensions				
Inches (mm)	Standard Model	Enclosure Options		
		M	W	X
A	***8.25 (210)***	**7.00 (178)**	**8.00 (204)**	**12.00 (305)**
B	***5.00 (127)***	**5.00 (127)**	**6.00 (153)**	**10.50 (267)**
C	***3.00 (77)***	**3.50 (89)**	**3.50 (89)**	**6.00 (153)**
D	9.37 (238)	8.50 (216)	9.50 (242)	12.50 (318)
E	9.48 (242)	9.00 (229)	10.00 (254)	13.00 (331)
F	6.23 (159)	6.00 (153)	7.00 (178)	11.00 (280)
G	8.87 (226)	7.75 (197)	8.75 (223)	12.00 (305)
H	3.37 (86)	2.00 (51)	4.00 (102)	8.00 (204)
Type	***NEMA 4 ABS**	**NEMA 12 Steel**	**NEMA 4 Steel**	**NEMA 4X composite**
lbs (kg)	5 (2.27)	7 (3.18)	9.50 (4.31)	11 (4.99)

*UL94-5VA ABS Composite.
Flush mount trim plate available for standard and "M" option models.



Circuit Connection: #10 AWG wire (pre-installed)



Energy Control Systems

PO Box 330607, Fort Worth, TX 76163
www.sinetamer.com

SineTamer
Advantage Series

Model: *ST-SMLA*

*300 kA Per Phase**

* Based on 3 Phase Wye, 4 Wire and Ground

General

Application: The ST-SMLA series was developed to answer a broad variety of demands from our customers. This device is robust enough to handle the punishment of service entrance applications while providing protection from transients that are generated inside the facility. The constant bombardment of these combination transients damages valuable equipment and wastes budget dollars.

IEEE –C62.41.1 & C62.41.2-2002 environments: Suitable for Categories: A, B & C (Most Severe Electrical Environments)

IEC Environments: Suitable for use in IEC 61643-11 environments

Circuit Topology: Parallel configured **Optimal Response Circuitry™** circuit design incorporating component-level, thermal fusing and ***Patent Pending*** internal, circuit board mounted, over-current fusing; and discrete ***"All Mode"*** protection (10 modes for 3 phase Wye units). All protection circuits are encapsulated in our high dielectric compound to assure long component life and complete protection from the weather and vibration.

Protection Modes: Industry-best practice of true all mode dedicated protection components for all operational modes of the electrical system. **Discrete L-N, L-L (Normal Mode) and L-G, N-G (Common Mode)** Example: Directly Connected Protection Elements in All 10 modes for a 3 phase, 4 wire, Wye system, (i.e. 3 L-N modes, 3 L-L modes, 3 L-G modes and 1 N-G mode).

Input Power: 50-400 Hz (60 Hz nominal)

Temperature Rating: Up to 80°C

Joules: 8800 based on 10/1000 industry standard testing procedures

Response Time: ≤ 1 ns

Standard Enclosure: NEMA 4 Rated with optional free gasket kit (P/N: GA001)

Diagnostics: Green LED's, one per phase, normally on. A wide range of optional diagnostics is available (see page two for details).

Circuit Interrupt: Internal component-level, thermal fusing and patent pending, circuit board mounted, over-current fusing.

UL Short Circuit Current Rating: 200 kAIC (UL's Highest Rating)

Product Qualifications:
Listed to UL1449 2nd Edition (Feb. 9, 2007 Rev.) by CSA, an NRTL,
CSA MC#241804, UL1283 and CE Compliant
ISO 9001 Certified Manufacturing Facility
CSA Certified Laboratory for WMTC

Key Features

- **Discrete *"All Mode"* Circuitry: Directly Connected Protection Elements in *"All Modes"* (10 modes for 3 phase, 4 wire Wye circuits) as recommend by NEMA LS-1 and IEEE Std. 1100-1999**
- **Industry Leading Measured Limiting Voltage (let-through) Performance**
- **UL 1283 Listed EMI/RFI Parallel Configured Optimal Response Circuitry™**
- **Local & Remote Diagnostics**
- **Independent Verification of Performance and Safety**
- **Component-Level, Thermal Fusing**
- **Patent Pending, Internal, Circuit Board Mounted, Over-Current Fusing**
- **Recommended for Panels up to 3000 amps.**

AC Power Panel Units

Made in USA

ISO 9001 MANUFACTURER ISO 9001:2000

2004 2006 FROST & SULLIVAN Transient Voltage Surge Suppressors Customer Value Enhancement Award

25 Year Unlimited Free Replacement Warranty

Energy Control Systems, P.O. Box 330607 Ft. Worth, TX 76163 – 817.483.8497 – Fax: 817.572.2242

"Power Quality Is Our Business"

Model	Circuit Type	MCOV	ANSI/IEEE C62.41.1 & C62.41.2 Let-through Voltage Test Results (tested w/6" lead length external to the enclosure per UL 1449)			
			Test Mode	A3 6 kV, 200 A 100 kHz Ring Wave @ 90° Phase Angle	B3/C1 6 kV, 3 kA Impulse Wave @ 90° Phase Angle	C3 20 kV, 10 kA Impulse Wave @ 90° Phase Angle
ST-SMLA1S1	120/240 V 1Ø (Split) (3 wire + ground)	150 V L-N 300 V L-L 150 V L-G 150 V N-G	L-N L-L L-G N-G	289 V 436 V 296 V 570 V	393 V 543 V 364 V 668 V	914 V 1,119 V 1,025 V 1,176 V
ST-SMLA3Y1	120/208 V 3Ø Wye (4 wire + ground)	150 V L-N 300 V L-L 150 V L-G 150 V N-G	L-N L-L L-G N-G	289 V 436 V 296 V 570 V	393 V 543 V 364 V 668 V	914 V 1,119 V 1,025 V 1,176 V
ST-SMLA1P2	240V, Single Ø (2 wire + ground)	320 L-N 320 L-G 320 N-G	L-N L-G N-G	450 V 450 V 940 V	588 V 588 V 1045 V	1070 V 1262 V 1575 V
ST-SMLA3Y2	220/380 - 277/480 V 3Ø Wye (4 wire + ground)	320 V L-N 550 V L-L 320 V L-G 320 V N-G	L-N L-L L-G N-G	410 V 686 V 420 V 806 V	529 V 777 V 533 V 1025 V	1,050 V 1,344 V 1,262 V 1,575 V
ST-SMLA3N2	240 V 3Ø Delta (NN) (3 wire + ground)	320 V L-L 320 V L-G	L-L L-G	420 V 420 V	533 V 533 V	1262 V 1262 V
ST-SMLA3N4	480 V 3Ø Delta (NN) (3 wire + ground)	550 V L-L 550 V L-G	L-L L-G	686 V 686 V	777 V 777 V	1344 V 1344 V
ST-SMLA3N6	600 V 3Ø Delta (NN) (3 wire + ground)	750 V L-L 750 V L-G	L-L L-G	886 V 886 V	900 V 900 V	1630 V 1630 V

Let-through Voltage Test Parameters: Positive Polarity, All voltages are peak (±10%). All tests are static except 150 V MCOV modes. Let-through voltages on static tests calculated by subtracting sinewave peak from let-through measured from zero. 150 V MCOV mode let-through voltages measured from the insertion point on the sinewave. *(Scope Settings: Time Base = 20 microseconds, Sampling Rate = 250 Megasamples/sec. These settings assure Let-through voltages test results are accurate).* ***All tests performed with 6" lead length (external to the enclosure), simulating actual installed performance.***

Single-pulse, surge current testing for all modes at rated currents, is in compliance with NEMA LS 1-1992. Single-pulse, surge current capacities of 200,000 amps or less are determined by single-unit testing of all components within each mode. Present industry test equipment limitations require testing of individual components or sub-assemblies within a mode for single-pulse, surge current capacities over 200,000 amps.

Options

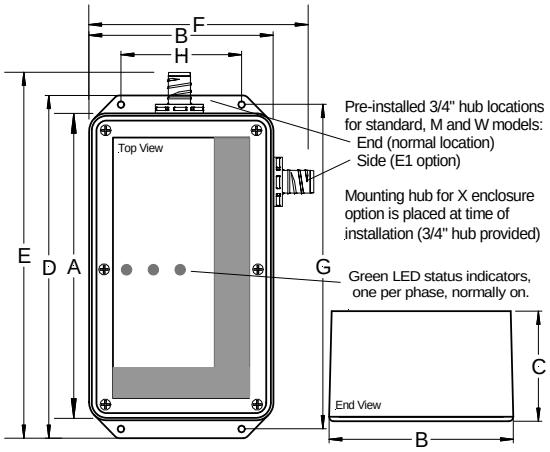
AC = Internal Audible Alarm w/ test button, mute switch and red LED
C = Form C dry relay contacts
D1 = Integral, non-fused disconnect switch (TVSS unit mounts inside)
D2 = External non-fused disconnect switch (TVSS mounts to outside)
D3 = Same as ***D1***, except no external handle
E1 = Hub on side of enclosure
E2 = No hub, wires only exiting from side of enclosure
E3 = No hub, wires only exiting the end of the enclosure
F = Internal, circuit board mounted over-current fuses
G = Removes the EMI/RFI capacitors from the suppressor (Available for non-sinewave tracking units only)
H = Increase MCOV to 25% above nominal
LP = Remote LED indicators in individual NEMA 4X housings
M = NEMA 12 Steel Enclosure
P = Flush Mount Plate
Q = Secondary surge arrester - UL category OWHX (Requires F option)
R1 = Remote lights on separate circuit board (board only – no enclosure)
R2 = Remote lights on separate circuit board in separate enclosure
S = Surge counter w/ reset button
W = NEMA 4 Steel Enclosure
X = NEMA 4X Composite Fiberglass Enclosure
XS = NEMA 4X Stainless Steel Enclosure

External Accessories: ***EACS*** = Externally mounted diagnostic module, combines ***AC***, ***C***, and ***S*** options
(Also available: ***EAC***, ***EC***, ***ECS***, and ***ES***)

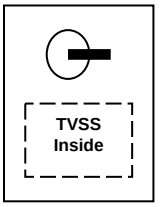
Mechanical

Enclosure Dimensions				
Inches (mm)	Standard Model	Enclosure Options		
		M	W	X
A	***8.25 (210)***	***10.00 (254)***	***10.00 (254)***	***12.00 (305)***
B	***5.00 (127)***	***8.00 (204)***	***8.00 (204)***	***10.50 (267)***
C	***3.00 (77)***	***4.00 (102)***	***4.00 (102)***	***6.00 (153)***
D	9.37 (238)	11.50 (293)	11.50 (293)	12.50 (318)
E	9.48 (242)	12.00 (305)	12.00 (305)	13.00 (331)
F	6.23 (159)	9.00 (229)	9.00 (229)	11.00 (280)
G	8.87 (226)	10.75 (274)	10.75 (274)	12.00 (305)
H	3.37 (86)	6.00 (153)	6.00 (153)	8.00 (204)
Type	***NEMA 4 ABS**	**NEMA 12 Steel**	**NEMA 4 Steel**	**NEMA 4X composite**
lbs (kg)	5 (2.27)	14 (6.36)	14 (6.36)	11 (4.99)

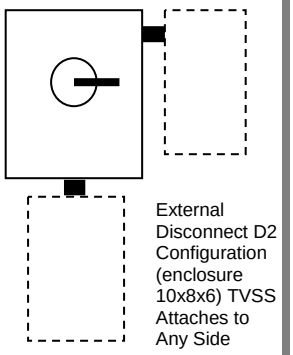
*UL94-5VA ABS Composite.
Flush mount trim plate available for standard and "M" option models.



Circuit Connection: #10 AWG wire (pre-installed)



Integral Disconnect D1, D3 option configuration (Enclosure 12x10x6)



External Disconnect D2 Configuration (enclosure 10x8x6) TVSS Attaches to Any Side

Energy Control Systems

PO Box 330607, Fort Worth, TX 76163
www.sinetamer.com

SineTamer
Advantage Series

Model: *ST-SSLA*

*90 kA Per Phase**

General

Application: The ST-SSLA series is one of the most versatile units in our product line. This fixed clamping type device is intended for general load applications at locations ranging from individual equipment disconnects to small service entrances. It is extremely effective in limiting internally generated transients when used on lighting or HVAC panels.

IEEE –C62.41.1 & C62.41.2-2002 environments: Suitable for Categories: A, B & C (Most Severe Electrical Environments)

IEC Environments: Suitable for use in IEC 61643-11 environments

Circuit Topology: Parallel configured **Optimal Response Circuitry™** circuit design incorporating component-level thermal fusing and ***Patent Pending*** internal, circuit board mounted, over-current fusing; and discrete ***"All Mode"*** protection (10 modes for 3 phase Wye units). All protection circuits are encapsulated in our high dielectric compound to assure long component life and complete protection from the weather and vibration.

Protection Modes: Industry-best practice of true all mode dedicated protection components for all operational modes of the electrical system. **Discrete L-N, L-L (Normal Mode) and L-G, N-G (Common Mode)** Example: Directly Connected Protection Elements in All 10 modes for a 3 phase, 4 wire, Wye system, (i.e. 3 L-N modes, 3 L-L modes, 3 L-G modes and 1 N-G mode).

Input Power: 50-400 Hz (60 Hz nominal)

Temperature Rating: Up to 80°C

Response Time: ≤ 1 ns

Standard Enclosure: NEMA 4 Rated with optional free gasket kit (P/N: GA001)
(Other enclosure options available see pg. 2)

Diagnostics: Green LED's, one per phase, normally on. A wide range of optional diagnostics is available (see page two for details).

Circuit Interrupt: Internal component-level, thermal fusing and patent pending, circuit board mounted, over-current fusing.

UL Short Circuit Current Rating: 200 kAIC (UL's Highest Rating)

Product Qualifications:
UL Lightning Protection System Certified Component
*Secondary Surge Arrestor (**Q** option)*
UL1449 2nd Edition, UL1283, cUL, and CE Compliant
ISO 9001 Certified Manufacturing Facility

* Based on 3 Phase Wye, 4 Wire and Ground

Key Features

- **Discrete *"All Mode"* Circuitry: Directly Connected Protection Elements in *"All Modes"* (10 modes for 3 phase, 4 wire Wye circuits) as recommend by NEMA LS-1 and IEEE Std. 1100-1999**
- **Industry Leading Measured Limiting Voltage (let-through) Performance**
- **UL 1283 Listed EMI/RFI Parallel Configured Optimal Response Circuitry™**
- **Local & Remote Diagnostics**
- **Independent Verification of Performance and Safety**
- **Component-Level, Thermal Fusing**
- **Patent Pending, Internal, Circuit Board Mounted, Over-Current Fusing**
- **Recommended for Panels up to 800 amps.**

AC Power Panel Units

Made in USA

ISO 9001 MANUFACTURER ISO 9001:2000

2004 2006 FROST & SULLIVAN Transient Voltage Surge Suppressors Customer Value Enhancement Award

25 Year Unlimited Free Replacement Warranty

Energy Control Systems, P.O. Box 330607 Ft. Worth, TX 76163 – 817.483.8497 – Fax: 817.572.2242

"Power Quality Is Our Business"

Model	Circuit Type	MCOV	(tested w/6" lead length external to the enclosure per UL 1449)			
			Test Mode	A3 6 kV, 200 A 100 kHz Ring Wave @ 90° Phase Angle	B3/C1 6 kV, 3 kA Impulse Wave @ 90° Phase Angle	C3 20 kV, 10 kA Impulse Wave @ 90° Phase Angle
ST-SSLA1S1	120/240 V 1Ø (Split) (3 wire + ground)	150 V L-N 300 V L-L 150 V L-G 150 V N-G	L-N L-L L-G N-G	296 V 473 V 297 V 578 V	401 V 593 V 402 V 655 V	914 V 1,119 V 1,025 V 1,176 V
ST-SSLA1P2	240V, Single Ø (2 wire + ground)	320 L-N 320 L-G 320 N-G	L-N L-G N-G	450 V 450 V 940 V	588 V 588 V 1045 V	1070 V 1262 V 1575 V
ST-SSLA3Y1	120/208 V 3Ø Wye (4 wire + ground)	150 V L-N 300 V L-L 150 V L-G 150 V N-G	L-N L-L L-G N-G	296 V 473 V 297 V 578 V	401 V 593 V 402 V 655 V	914 V 1,119 V 1,025 V 1,176 V
ST-SSLA3Y2	220/380 - 277/480 V 3Ø Wye (4 wire + ground)	320 V L-N 550 V L-L 320 V L-G 320 V N-G	L-N L-L L-G N-G	443 V 721 V 450 V 942 V	604 V 878 V 588 V 1045 V	1,050 V 1,344 V 1,262 V 1,575 V
ST-SSLA3N2	240 V 3Ø Delta (NN) (3 wire + ground)	320 V L-L 320 V L-G	L-L L-G	450 V 450 V	588 V 588 V	1,262 V 1,262 V
ST-SSLA3N4	380V & 480V 3Ø Delta (NN) (3 wire + ground)	550 V L-L 550 V L-G	L-L L-G	721 V 721 V	878 V 878 V	1,344 V 1,344 V

Let-through Voltage Test Parameters: Positive Polarity, All voltages are peak (±10%). All tests are static except 150 V MCOV modes. Let-through voltages on static tests calculated by subtracting sinewave peak from let-through measured from zero. 150 V MCOV mode let-through voltages measured from the insertion point on the sinewave. *(Scope Settings: Time Base = 20 Microseconds, Sampling Rate = 250 Megasamples/sec. These settings assure Let-through voltages test results are accurate).* ***All tests performed with 6" lead length (external to the enclosure), simulating actual installed performance.***

Surge Current Testing: Single-pulse surge current testing for all modes at rated currents as recommended by NEMA LS1-1992. Single pulse surge current capacities of 200,000 amps or less are determined by testing all suppression components within each mode as a group. Present industry test equipment limitations require testing of individual suppression components or sub-assemblies within a mode for single-pulse surge capacities over 200,000 amps.

Options

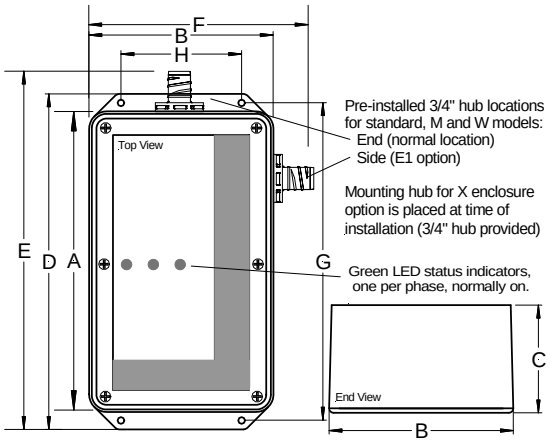
AC = Internal Audible Alarm w/ test button, mute switch and red LED
C = Form C dry relay contacts
D1 = Integral, non-fused disconnect switch (TVSS unit mounts inside)
D2 = External non-fused disconnect switch (TVSS mounts to outside)
D3 = Same as D1, except no external handle
E1 = Hub on side of enclosure
E2 = No hub, wires only exiting from side of enclosure
E3 = No hub, wires only exiting the end of the enclosure
F = Internal, circuit board mounted over-current fuses
G = Removes the EMI/RFI capacitors from the suppressor (Available for non-sinewave tracking units only)
LP = Remote LED indicators in individual NEMA 4X housings
M = NEMA 12 Steel Enclosure
P = Flush Mount Plate
Q = Labeled as a secondary surge arrester - UL category OWHX (Requires F option)
R1 = Remote lights on separate circuit board (board only – no enclosure)
R2 = Remote lights on separate circuit board in separate enclosure
S = Surge counter w/ reset button
W = NEMA 4 Steel Enclosure
X = NEMA 4X Composite Fiberglass Enclosure
XS = NEMA 4X Stainless Steel Enclosure

External Accessories: ***EACS*** = Externally mounted diagnostic module, combines ***AC***, ***C***, and ***S*** options
(Also available: ***EAC***, ***EC***, ***ECS***, and ***ES***)

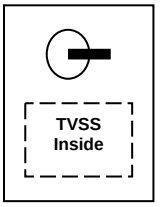
Mechanical

Enclosure Dimensions				
Inches (mm)	Standard Model	Enclosure Options		
		M	W	X
A	***8.25 (210)***	**7.00 (178)**	**8.00 (204)**	**12.00 (305)**
B	***5.00 (127)***	**5.00 (127)**	**6.00 (153)**	**10.50 (267)**
C	***3.00 (77)***	**3.50 (89)**	**3.50 (89)**	**6.00 (153)**
D	9.37 (238)	8.50 (216)	9.50 (242)	12.50 (318)
E	9.48 (242)	9.00 (229)	10.00 (254)	13.00 (331)
F	6.23 (159)	6.00 (153)	7.00 (178)	11.00 (280)
G	8.87 (226)	7.75 (197)	8.75 (223)	12.00 (305)
H	3.37 (86)	2.00 (51)	4.00 (102)	8.00 (204)
Type	***NEMA 4 ABS**	**NEMA 12 Steel**	**NEMA 4 Steel**	**NEMA 4X composite**
lbs (kg)	5 (2.27)	7 (3.18)	9.50 (4.31)	11 (4.99)

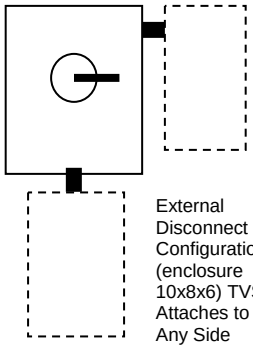
*UL94-5VA ABS Composite.
Flush mount trim plate available for standard and "M" option models.



Circuit Connection: #10 AWG wire (pre-installed)



Integral Disconnect D1, D3 option configuration (Enclosure 12x10x6)



External Disconnect D2 Configuration (enclosure 10x8x6) TVSS Attaches to Any Side

Energy Control Systems
PO Box 330607, Fort Worth, TX 76163
www.sinetamer.com

Transient Voltage Surge Suppressors By:

ST-SPT Series

Series Wired AC Unit with Sine Wave Tracking and Discrete All-Mode Protection

"Power Quality is our Only Business"

P.O. Box 330607
Ft. Worth, TX 76163
Phone: 817.483.8497
Fax: 817.572.2242
www.sinetamer.com

The SineTamer© ST-SPT devices provide the best ring wave transient protection available for a device of its type. These devices are intended for single 120 or 240 VAC circuit applications at locations feeding sensitive/critical equipment. It is extremely effective in limiting transients generated inside the facility and is an absolute must on circuits feeding critical microprocessor based equipment. It boasts a robust 40kA per phase peak surge current rating on the 15 amp models and 80kA per phase on the 30 amp models.

This economical device is unique in that it is designed as a stand-alone surge suppression device and requires no special enclosure when used outside an existing enclosure or cabinet. Its compact size makes installation a breeze and the warranty is the best in the industry. Add to all that, dedicated "all mode" **E**nhanced **S**inewave **T**racking™ and completely encapsulated **O**ptimal **R**esponse **N**etwork™, and you get a device that defines effective and reliable surge suppression.

We believe that we offer the most versatile TVSS devices on the market with performance specs that are superior to our competitors and a warranty that is second to none.

GENERAL

Description:	Series wired parallel-connected transient voltage surge suppressor with encapsulated **O**ptimal **R**esponse **N**etwork™ and **E**nhanced **S**inewave **T**racking circuitry
Application:	Designed for use at ANSI/IEEE Category A with susceptibility up to medium exposure levels to protect sensitive/critical loads fed by a single 120 or 240VAC circuit.
Warranty:	**25 Years Unlimited Free Replacement**
Unit Listings:	Tested to UL 1449 2nd Edition, IEC 61643-1 (Class 2 & 3); ISO 9001:2000 (Surge Suppression Incorporated)

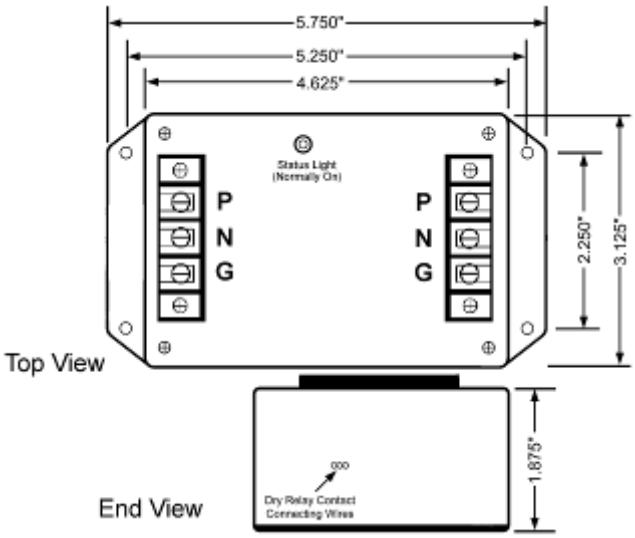
MECHANICAL

Enclosure:	Plastic, UL 94V
Mounting:	External mounting feet and optional DIN rail mount
Connection Method:	3-Lug screw terminal strip at both the input and output sides of the device.
Shipping Weight:	≈ 2 lbs

ELECTRICAL

Circuit Design:	Series wired, parallel connected hybrid design incorporating discrete all mode protection and utilizing our encapsulated **O**ptimal **R**esponse **N**etwork™ and **E**nhanced **S**inewave **T**racking circuitry design to provide lowest possible let-through-voltages. All suppression circuits are completely encapsulated in our exclusive compound to assure long component life and complete protection from the environment and/or vibration.
Protection Modes:	Dedicated protection components and circuitry for each mode. Discrete L-N (Normal Mode), and Discrete L-G, N-G (Common Mode)
Input Power Frequency:	50-60Hz
Maximum Continuous Operating Current:	15 and 30 Amps AC (60 Amp models available)
Response Time:	<1 nanosecond
Circuit Diagnostics:	Super Bright LED, normally on.
Circuit Interrupt:	External (see installation instructions for details).
DIN option:	Standard DIN rail mounting kit – pre installed along 5.75" edge. Use -DIN adder for option.

Because we are constantly seeking to improve our products, specifications are subject to change at any time.



MEASURED LIMITING VOLTAGE PERFORMANCE AND ELECTRICAL SPECIFICATIONS					
Model	MCOV	Mode	ANSI/IEEE C62.41 & C62.45 Let-Through Voltage Test Results		
			A1 2kV, 67A 100KHz Ring Wave 180º Phase Angle	A3 6kV, 200A 100KHz Ring Wave 90º Phase Angle	B3/C1 6kV, 3kA Impulse Wave 90º Phase Angle
ST-SPT120-x-DIN (15 - 30)	150 L-N 150 L-G 150 N-G	L-N L-G N-G	18V (D) 50V (D) 33V (S)	94V (D) 190V (D) 94V (S)	316V (D) 429V (D) 498V (S)
ST-SPT240-x-DIN (15 - 30)	300 L-N 300 L-G 300 N-G	L-N L-G N-G	18V (S) 50V (S) 33V (S)	121V (S) 220V (S) 121V (S)	548V (S) 558V (S) 655V (S)
ST-SPT380-15-DIN ST-SPT480-15-DIN	550 L-N 550 L-G 550 N-G	L-N L-G N-G	35 (S) 87 (S) 65 (S)	725 (S) 950 (S) 725 (S)	855 (S) 1,014 (S) 855 (S)

***Measured Limiting Voltage (Let-Through) Test Environment:** Dynamic (D) or Static (S), positive polarity. All voltages are peak (±10%). Time Base is 1ms. 180° phase angle voltages are measured form the zero crossing, 90° phase angle voltages are measured from the positive peak of the sine wave to the positive peak of the surge indicating actual excess voltage let through. All tests were performed with the device connected in series simulating actual installation.

****Suppressed Voltage Test Environment** using test parameters as defined by Underwriters Laboratory: Dynamic (D) or Static (S), Positive Polarity. Time base=10μs. All voltages are peak (±10%), 90E phase angle voltages are measured from the zero crossing to the peak of the surge. All SineTamer products are manufactured exclusively for Surge Suppression Incorporated.

Because we are constantly seeking to improve our products, specifications are subject to change at any time.

Transient Voltage Surge Suppressors By:

ST-SPT-RJ Series

Series Wired AC Unit with Sine Wave Tracking and Discrete All-Mode Protection

SineTamer
Energy Control Systems

"Power Quality is our Only Business"

P.O. Box 330607
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Phone: 817.483.8497
Fax: 817.572.2242
www.sinetamer.com

The SineTamer© ST-SPT devices provide the best ring wave transient protection available for a device of its type. These devices are intended for single 120 VAC circuit applications at locations feeding sensitive/critical equipment. It is extremely effective in limiting transients generated inside the facility and is an absolute must on circuits feeding critical microprocessor based equipment. It boasts a robust 20kA per mode peak surge current rating on the 15 amp models and 40kA per mode on the 30 amp models.

This economical device is unique in that it is designed as a stand-alone surge suppression device and requires no special enclosure when used outside an existing enclosure or cabinet. Its compact size makes installation a breeze and the warranty is the best in the industry. Add to all that, dedicated "all mode" **E**nhanced **S**inewave **T**racking™ and completely encapsulated **O**ptimal **R**esponse **N**etwork™, and you get a device that defines effective and reliable surge suppression.

We believe that we offer the most versatile TVSS devices on the market with performance specs that are superior to our competitors and a warranty that is second to none.

GENERAL

Description:	Series wired parallel-connected transient voltage surge suppressor with encapsulated **O**ptimal **R**esponse **N**etwork™ and **E**nhanced **S**inewave **T**racking circuitry (20kA per mode peak surge current.)
Application:	Designed for use at ANSI/IEEE Category A with susceptibility up to medium exposure levels to protect sensitive/critical loads fed by a single 120VAC circuit.
Warranty:	**25 Years Unlimited Free Replacement**
Unit Listings:	Tested to UL 1449 Second Edition and CUL

MECHANICAL

Enclosure:	Plastic, UL 94V
Mounting:	External mounting feet.
Connection Method:	3-Lug screw terminal strip at both the input and output sides of the device.
Shipping Weight:	≈ 2 lbs

ELECTRICAL

Circuit Design:	Series wired, parallel connected hybrid design incorporating discrete all mode protection and utilizing our encapsulated **O**ptimal **R**esponse **N**etwork™ and **E**nhanced **S**inewave **T**racking circuitry design to provide lowest possible let-through-voltages. All suppression circuits are completely encapsulated in our exclusive compound to assure long component life and complete protection from the environment and/or vibration.
Protection Modes:	Dedicated protection components and circuitry for each mode. Discrete L-N (Normal Mode), and Discrete L-G, N-G (Common Mode)
Input Power Frequency:	50-60Hz
Maximum Continuous Operating Current:	15 and 30 Amps AC
Response Time:	<1 nanosecond
Circuit Diagnostics:	Super Bright LED, normally on.
Circuit Interrupt:	External (see installation instructions for details).
Telephone Line Protection:	RJ14 – two telephone line - Standard 3002/C2 unconditioned voice grade lines, fax lines, modem lines and **ISDN** lines to protect data transmission system equipment from damaging transients generated outside of the facility.

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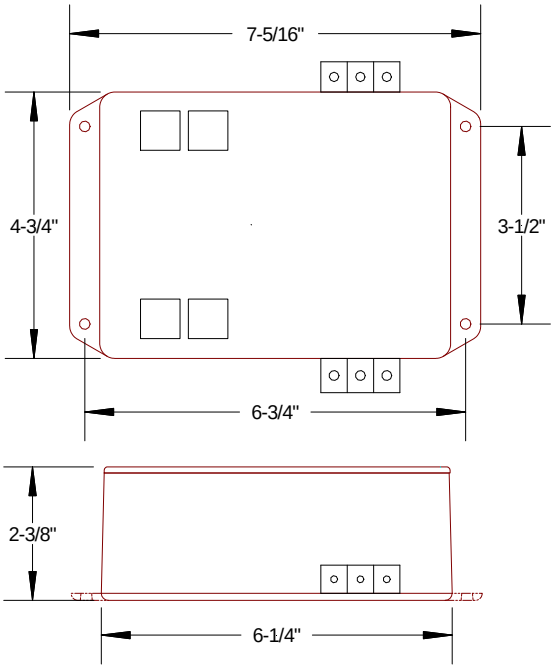

Actual unit may vary from picture.

MEASURED LIMITING VOLTAGE PERFORMANCE AND ELECTRICAL SPECIFICATIONS

Model	MCOV	Mode	ANSI/IEEE C62.41 & C62.45 Let-Through Voltage Test Results		
			A1 2kV, 67A 100KHz Ring Wave 180º Phase Angle	A3 6kV, 200A 100KHz Ring Wave 90º Phase Angle	B3/C1 6kV, 3kA Impulse Wave 90º Phase Angle
ST-SPT120-15-RJ14	150 L-N 150 L-G 150 N-G	L-N L-G N-G	18V (D) 50V (D) 33V (S)	94V (D) 190V (D) 94V (S)	316V (D) 429V (D) 498V (S)
ST-SPT240-x-RJ14 (15 - 30)	300 L-N 300 L-G 300 N-G	L-N L-G N-G	18V (S) 50V (S) 33V (S)	121V (S) 220V (S) 121V (S)	548V (S) 558V (S) 655V (S)

***Measured Limiting Voltage (Let-Through) Test Environment:** Dynamic (D) or Static (S), positive polarity. All voltages are peak (±10%). Time Base is 1ms. 180° phase angle voltages are measured form the zero crossing, 90° phase angle voltages are measured from the positive peak of the sine wave to the positive peak of the surge indicating actual excess voltage let through. All tests were performed with the device connected in series simulating actual installation.

****Suppressed Voltage Test Environment** using test parameters as defined by Underwriters Laboratory: Dynamic (D) or Static (S), Positive Polarity. Time base=10μs. All voltages are peak (±10%), 90E phase angle voltages are measured from the zero crossing to the peak of the surge. All SineTamer products are manufactured exclusively for Energy Control Systems by Surge Suppression Incorporated.

RJ14 ANSI/IEEE C62.41-1991 Let-through Voltage Tests		**Let-through Voltage test Environment** using ANSI/IEEE C62.41-1991, C62.45-1992; Static, Positive Polarity All voltages are peak (±10%), Time base = 1ms
Test Mode	Test Category B3/C1 Impulse Wave 6,000V 3,000A	
L-L L-G	350 350	

PERFORMANCE

Maximum Continuous Operating Voltage:	130Vrms
Maximum Continuous Operating Current:	360ma
Peak Surge Current per Pair:	20,000 amps per pair
Response Time:	<1 nanosecond

Because we are constantly seeking to improve our products, specifications are subject to change at any time.

Transient Voltage Surge Suppressors By:

ST-SPT Series

Series Wired AC Unit with Sine Wave Tracking and Discrete All-Mode Protection

SineTamer
Energy Control Systems

"Power Quality is our Only Business"

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Ft. Worth, TX 76163
Phone: 817.483.8497
Fax: 817.572.2242
www.sinetamer.com

The SineTamer© ST-SPT devices provide the best ring wave transient protection available for a device of its type. These devices are intended for single 120, 240, 380 or 480 VAC circuit applications at locations feeding sensitive/critical equipment. It is extremely effective in limiting transients generated inside the facility and is an absolute must on circuits feeding critical microprocessor based equipment. It boasts a robust 60kA per phase peak surge current rating on all models.

This economical device is unique in that it is designed as a stand-alone surge suppression device and requires no special enclosure when used outside an existing enclosure or cabinet. Its compact size makes installation a breeze and the warranty is the best in the industry. Add to all that, dedicated "all mode" **E**nhanced **S**inewave **T**racking™ and completely encapsulated **O**ptimal **R**esponse **N**etwork™, and you get a device that defines effective and reliable surge suppression.

We believe that we offer the most versatile TVSS devices on the market with performance specs that are superior to our competitors and a warranty that is second to none.

GENERAL

Description:	Series wired parallel-connected transient voltage surge suppressor with encapsulated **O**ptimal **R**esponse **N**etwork™ and **E**nhanced **S**inewave **T**racking circuitry
Application:	Designed for use at ANSI/IEEE Category A with susceptibility up to medium exposure levels to protect sensitive/critical loads fed by a single circuit.
Warranty:	**25 Years Unlimited Free Replacement**
Unit Listings:	Tested to UL 1449 Second Edition and CUL

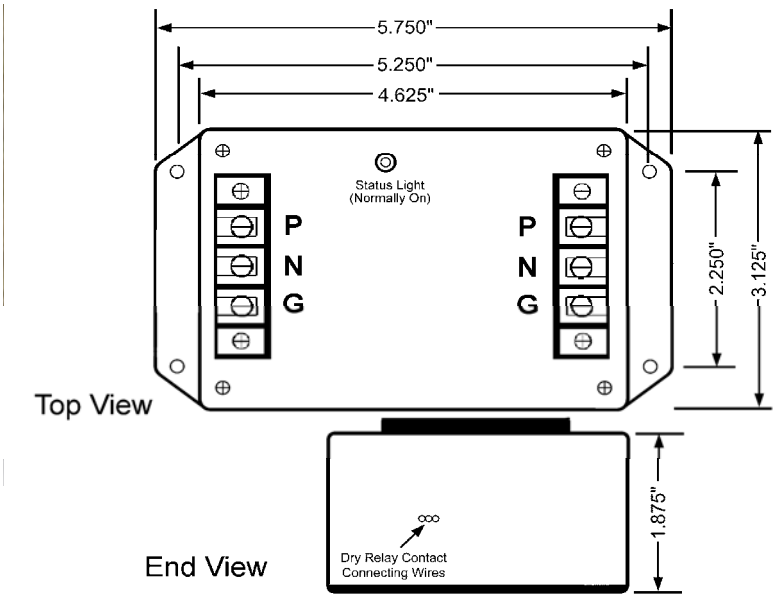
MECHANICAL

Enclosure:	Plastic, UL 94V
Mounting:	External mounting feet.
Connection Method:	3-Lug screw terminal strip at both the input and output sides of the device.
Shipping Weight:	≈ 2 lbs

ELECTRICAL

Circuit Design:	Series wired, parallel connected hybrid design incorporating discrete all mode protection and utilizing our encapsulated **O**ptimal **R**esponse **N**etwork™ and **E**nhanced **S**inewave **T**racking circuitry design to provide lowest possible let-through-voltages. All suppression circuits are completely encapsulated in our exclusive compound to assure long component life and complete protection from the environment and/or vibration.
Protection Modes:	Dedicated protection components and circuitry for each mode. Discrete L-N (Normal Mode), and Discrete L-G, N-G (Common Mode)
Input Power Frequency:	50-60Hz
Max Operating Current:	15 and 30 Amps AC (60 Amp models available)
EMI/RFI Attenuation:	40dB Max. from 1kHz to 10MHz
Circuit Diagnostics:	Super Bright LED, normally on.
Circuit Interrupt:	External (see installation instructions for details).
kAIC Rating:	200 kAIC when installed according to installation instructions
Options:	-P = wires on one end for parallel install, -N = remove N-G tracking capacitor, -DIN = din rail mounting feet. –C = DRC (125Vrms, 0.5 amps; 30VDC, 1.0 amps – N/O, N/C)
Remote Alarm option:	Dry Relay Contacts, 125Vrms, 0.5 amps; 30VDC, 1.0 amps – N/O, N/C. These contacts are for use in conjunction with external status monitoring devices and are connected via the 18ga wires provided. Add suffix "C" for DRC option.

Because we are constantly seeking to improve our products, specifications are subject to change at any time.



Unit above is a representation only of the ST-SP120-P. Actual unit has 3 wires.

MEASURED LIMITING VOLTAGE PERFORMANCE AND ELECTRICAL SPECIFICATIONS

Model	MCOV	Mode	ANSI/IEEE C62.41 & C62.45 Let-Through Voltage Test Results		
			A1 2kV, 67A 100KHz Ring Wave 180º Phase Angle	A3 6kV, 200A 100KHz Ring Wave 90º Phase Angle	B3/C1 6kV, 3kA Impulse Wave 90º Phase Angle
ST-SPT120-x (15 - 30)	150 L-N	L-N	18V (D)	94V (D)	316V (D)
	150 L-G	L-G	50V (D)	190V (D)	429V (D)
	150 N-G	N-G	33V (S)	94V (S)	498V (S)
ST-SP120-P	150 L-N	L-N	28V (D)	99V (D)	325V (D)
	150 L-G	L-G	63V (D)	210V (D)	440V (D)
	150 N-G	N-G	36V (S)	102V (S)	550V (S)
ST-SPT240-x (15 - 30)	300 L-N	L-N	18V (S)	121V (S)	548V (S)
	300 L-G	L-G	50V (S)	220V (S)	558V (S)
	300 N-G	N-G	33V (S)	121V (S)	655V (S)
ST-SP240-P	300 L-N	L-N	28V (S)	135V (S)	578V (S)
	300 L-G	L-G	63V (S)	235V (S)	588V (S)
	300 N-G	N-G	36V (S)	130V (S)	705V (S)
ST-SPT380-15 ST-SPT480-15	550 L-N	L-N	35 (S)	725 (S)	855 (S)
	550 L-G	L-G	87 (S)	950 (S)	1,014 (S)
	550 N-G	N-G	65 (S)	725 (S)	855 (S)

***Measured Limiting Voltage (Let-Through) Test Environment:** Dynamic (D) or Static (S), positive polarity. All voltages are peak (±10%). Time Base is 1ms. 180° phase angle voltages are measured form the zero crossing, 90° phase angle voltages are measured from the positive peak of the sine wave to the positive peak of the surge indicating actual excess voltage let through. All tests were performed with the device connected in series simulating actual installation.

****Suppressed Voltage Test Environment** using test parameters as defined by Underwriters Laboratory: Dynamic (D) or Static (S), Positive Polarity. Time base=10μs. All voltages are peak (±10%), 90E phase angle voltages are measured from the zero crossing to the peak of the surge. All SineTamer products are manufactured exclusively for Energy Control Systems by Surge Suppression Incorporated.

Because we are constantly seeking to improve our products, specifications are subject to change at any time.

Transient Voltage Surge Suppressors By:

ST-CLDINxx-yz Data Line Models

Current Loop/Signal Line protection device with Discrete All-Mode Protection

"Power Quality is our Business"

P.O. Box 330607
Ft. Worth, TX 76163
Phone: 817.483.8497
Fax: 817.572.2242
www.sinetamer.com

The Series ST-CLDINxx-yz devices are designed to protect current loop process instrument, data transmission, control, and signal line circuits. These devices are intended for installation as close to the electrical power source of the equipment as possible so as to allow for a common point for grounding.

This device is for circuits with up to 3 pair of signal lines connected via the terminal strips provided, making installation a breeze. A ground lug is provided on the side of the unit to insure a low impedance ground discharge path.

The unique design of these devices makes them among the most versatile TVSS devices on the market with superior performance specs and a warranty that is second to none.

GENERAL	
Description:	Series wired transient voltage surge suppressor with encapsulated **O**ptimal **R**esponse **N**etwork™ circuitry for protection of current loop and data/signal type circuits.
Application:	Designed for use on data, signal, current loop and control circuits to protect equipment from damaging transients generated between terminals and equipment in the data collection/transmission system.
Warranty:	**25 Years Unlimited Free Replacement**

MECHANICAL	
Enclosure:	Plastic, UL 94-5VA
Mounting:	DIN rail mounting foot
Connection Method:	Wire clamping box terminals located at the input and output sides of the device. Wire size: Lines # 12-22 AWG, Ground # 6-12 AWG.
Shipping Weight:	**<** 1 lbs

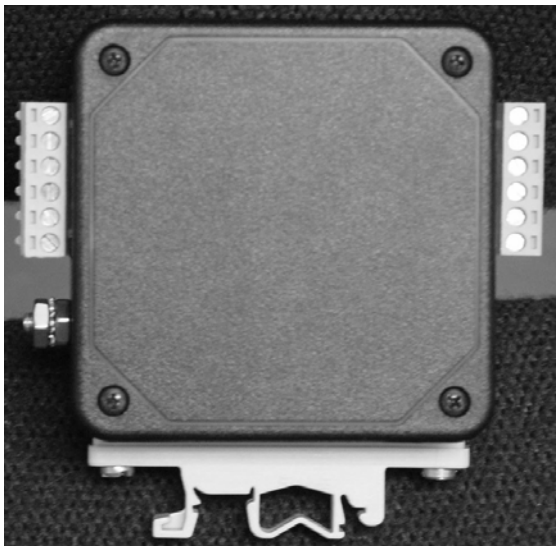
CIRCUITRY	
Circuit Design:	Series wired design incorporating discrete all mode protection and utilizing our encapsulated **O**ptimal **R**esponse **N**etwork™ design to provide lowest possible let-through voltages. All suppression circuits are encapsulated in our high dielectric compound to assure long component life and complete protection from the environment and/or vibration.
Protection Modes:	Dedicated protection components and circuitry for each mode. Discrete each L-L (Normal Mode) and each L-G (Common Mode)

PERFORMANCE	
Maximum Continuous Operating Voltage:	7.5, 15, 36, 54, and 140 V
Maximum Continuous Operating Current:	500 mA
Series resistance:	2 & 10 Mbps models:5 Ohms per wire (10 Ohms loop), 100 Mbps models: 0 Ohms per wire/loop
Maximum Data Rate:	Up to 100 Mbps
Peak Surge Current per Pair:	L-L 10 kA, L-G 10 kA for 2 & 10 Mbps models, 1,500 Watts per mode (4,500 Watts total for 100 Mbps models.
Response Time:	**<** 1 ns

Table of Maximum Suggested Operating Limits, Data Rate & Additional Device Resistance						
Nominal System Operating Voltage (Vnom)	**S-CLDINxx-yz Operating Voltage Model Number**	**Maximum Continuous Operating Voltage (MCOV)**		**Maximum Continuous Operating Current (MCOC)**	**Maximum Digital/ Analog Data Rates Vs. Additional Series Resistance**	
		Voltage (L-L)	Voltage (L-G)		**2 Mbps/ 20 MHz: (z = blank) & 10 Mbps/ 100 MHz: (z = X) models:**	**100 Mbps/ 1 GHz: (z = C) models:**
0 > Vnom ≤ 6	ST-CLDIN5-yz	± 7.5 Vpk	± 7.5 Vpk	500 mA	5 Ω per line (10 Ω per pair/loop)	0 Ω per line or loop
6 > Vnom < 15	ST-CLDIN12-yz	± 15 Vpk	± 15 Vpk	500 mA	5 Ω per line (10 Ω per pair/loop)	0 Ω per line or loop
15 ≤ Vnom < 32	ST-CLDIN24-yz	± 36 Vpk	± 36 Vpk	500 mA	5 Ω per line (10 Ω per pair/loop)	0 Ω per line or loop
32 ≥ Vnom < 60	ST-CLDIN48-yz	± 62 Vpk	± 62 Vpk	500 mA	5 Ω per line (10 Ω per pair/loop)	0 Ω per line or loop
60 ≥ Vnom ≤ 190	ST-CLDIN140-yz	± 140 Vpk	± 140 Vpk	500 mA	5 Ω per line (10 Ω per pair/loop)	0 Ω per line or loop

*Notes: The lower case "y" preceding the model string suffix character "z" is set to: 2, 4 or 6 to specify the number of terminals to be protected. Odd numbers of conductors require the use of the next higher even numbered model or an additional like model. All S-CLDINxx-yz models use 6-position connectors with the appropriate number of labeled working terminals specified by "y".

Let-Through Voltages Using ANSI/IEEE C62.45 & C62.41 Test Environment: Static, positive polarity. All voltages are peak (±10%).				
Model	**Test Mode**	**B3/C1 Impulse Wave 6 kV, 3 kA**		**10 x 1,000 µs Impulse waveform IPP = 100 Apk**
		2 Mbps	**10 Mbps**	**100 Mbps**
ST-CLDIN5-yz	L-G L-L	< 20 < 20	< 20 < 20	< 20 < 20
ST-CLDIN12-yz	L-G L-L	< 30 < 30	< 30 < 30	< 30 < 30
ST-CLDIN24-yz	L-G L-L	< 40 < 40	< 50 < 50	< 60 < 60
ST-CLDIN48-yz	L-G L-L	< 80 < 80	< 60 < 60	< 90 < 90
ST-CLDIN140-yz	L-G L-L	< 160 < 160	< 220 < 220	< 250 < 250



Low speed ST-CLDINxx-y [z = blank (2 Mbps.)] series models are designed to protect current loop circuits, signal lines &/or slow-speed data lines feeding transducers, leak detectors, flow meters and a broad variety of similar sensory devices. High-speed data signal lines and equipment may be protected using the ST-CLDINxx-yX [z = X (10 Mbps)] or the ST-CLDINxx-yC [z = C (100 Mbps)]. *Models may be optioned with 2, 4 or 6 terminal connections as shown above.

Image is ST-CLDINxx-yz Model
Dimensions:
4.5" Wide x 4.5" High x 1.4" Deep
Actual unit may vary from picture

Transient Voltage Surge Suppressors By:

ST-CLMFxx-yz Data Line Models

Current Loop/Signal Line protection device with Discrete All-Mode Protection

SineTamer Energy Control Systems

Made in the USA

"Power Quality is our Only Business"

P.O. Box 330607
Ft. Worth, TX 76163
Phone: 817.483.8497
Fax: 817.572.2242
www.sinetamer.com

The Series ST-CLMFxx-yz devices are designed to protect current loop process instrument, data transmission, control, and signal line circuits. These devices are intended for installation as close to the electrical power source of the equipment as possible so as to allow for a common point for grounding.

This device is for circuits with up to 3 pair of signal lines connected via the terminal strips provided, making installation a breeze. A ground lug is provided on the side of the unit to insure a low impedance ground discharge path.

The unique design of these devices makes them among the most versatile TVSS devices on the market with superior performance specs and a warranty that is second to none.

GENERAL

Description:	Series wired transient voltage surge suppressor with encapsulated **O**ptimal **R**esponse **N**etwork™ circuitry for protection of current loop and data/signal type circuits.
Application:	Designed for use on data, signal, current loop and control circuits to protect equipment from damaging transients generated between terminals and equipment in the data collection/transmission system.
Warranty:	**25 Years Unlimited Free Replacement**

MECHANICAL

Enclosure:	Plastic, UL 94-5VA
Mounting:	External mounting feet
Connection Method:	Wire clamping box terminals located at the input and output sides of the device. Wire size: Lines # 12-22 AWG, Ground # 6-12 AWG.
Shipping Weight:	**<** 1 lbs

CIRCUITRY

Circuit Design:	Series wired design incorporating discrete all mode protection and utilizing our encapsulated **O**ptimal **R**esponse **N**etwork™ design to provide lowest possible let-through voltages. All suppression circuits are encapsulated in our high dielectric compound to assure long component life and complete protection from the environment and/or vibration.
Protection Modes:	Dedicated protection components and circuitry for each mode. Discrete each L-L (Normal Mode) and each L-G (Common Mode)

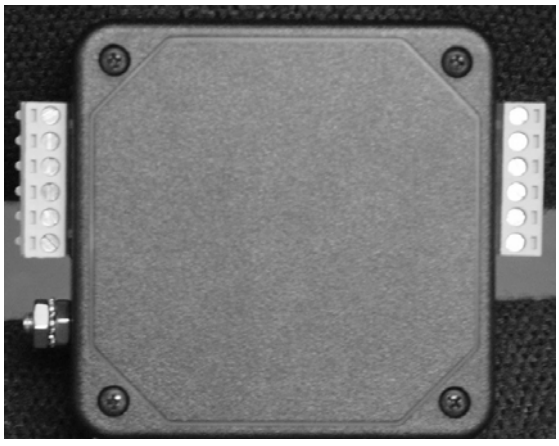
PERFORMANCE

Maximum Continuous Operating Voltage:	7.5, 15, 36, 54, and 140 V
Maximum Continuous Operating Current:	500 mA
Series resistance:	2 & 10 Mbps models:5 Ohms per wire (10 Ohms loop), 100 Mbps models: 0 Ohms per wire/loop
Maximum Data Rate:	Up to 100 Mbps
Peak Surge Current per Pair:	L-L 10 kA, L-G 10 kA for 2 & 10 Mbps models, 1,500 Watts per mode (4,500 Watts total for 100 Mbps models.
Response Time:	**<** 1 ns

Table of Maximum Suggested Operating Limits, Data Rate & Additional Device Resistance						
Nominal System Operating Voltage (Vnom)	*** S-CLMFxx-yz Operating Voltage Model Number**	**Maximum Continuous Operating Voltage (MCOV)**		**Maximum Continuous Operating Current (MCOC)**	**Maximum Digital/ Analog Data Rates Vs. Additional Series Resistance**	
		Voltage (L-L)	Voltage (L-G)		**2 Mbps/ 20 MHz: (z = blank) & 10 Mbps/ 100 MHz: (z = X) models:**	**100 Mbps/ 1 GHz: (z = C) models:**
0 > Vnom ≤ 6	ST-CLMF5-yz	± 7.5 Vpk	± 7.5 Vpk	500 mA	5 Ω per line (10 Ω per pair/loop)	0 Ω per line or loop
6 > Vnom < 15	ST-CLMF12-yz	± 15 Vpk	± 15 Vpk	500 mA	5 Ω per line (10 Ω per pair/loop)	0 Ω per line or loop
15 ≤ Vnom < 32	ST-CLMF24-yz	± 36 Vpk	± 36 Vpk	500 mA	5 Ω per line (10 Ω per pair/loop)	0 Ω per line or loop
32 ≥ Vnom < 60	ST-CLMF48-yz	± 62 Vpk	± 62 Vpk	500 mA	5 Ω per line (10 Ω per pair/loop)	0 Ω per line or loop
60 ≥ Vnom ≤ 190	ST-CLMF140-yz	± 140 Vpk	± 140 Vpk	500 mA	5 Ω per line (10 Ω per pair/loop)	0 Ω per line or loop

*Notes: The lower case "y" preceding the model string suffix character "z" is set to: 2, 4 or 6 to specify the number of terminals to be protected. Odd numbers of conductors require the use of the next higher even numbered model or an additional like model. All S-CLMFxx-yz models use 6-position connectors with the appropriate number of labeled working terminals specified by "y".

Let-Through Voltages Using ANSI/IEEE C62.45 & C62.41 Test Environment: Static, positive polarity. All voltages are peak (±10%).				
Model	**Test Mode**	**Cat. B Impulse Wave 6 kV, 3 kA**		**10 x 1,000 µs Impulse waveform IPP = 100 Apk**
		2 Mbps	**10 Mbps**	**100 Mbps**
ST-CLMF5-yz	L-G L-L	< 20 < 20	< 20 < 20	< 20 < 20
ST-CLMF12-yz	L-G L-L	< 30 < 30	< 30 < 30	< 30 < 30
ST-CLMF24-yz	L-G L-L	< 40 < 40	< 50 < 50	< 60 < 60
ST-CLMF48-yz	L-G L-L	< 80 < 80	< 60 < 60	< 90 < 90
ST-CLMF140-yz	L-G L-L	< 160 < 160	< 220 < 220	< 250 < 250



Low speed ST-CLMFxx-y [z = blank (2 Mbps.)] series models are designed to protect current loop circuits, signal lines &/or slow-speed data lines feeding transducers, leak detectors, flow meters and a broad variety of similar sensory devices. High-speed data signal lines and equipment may be protected using the ST-CLMFxx-yX [z = X (10 Mbps)] or the ST-CLMFxx-yC [z = C (100 Mbps)]. *Models may be optioned with 2, 4 or 6 terminal connections as shown above.

Image is ST-CLMFxx-yz Model
Dimensions:
4.5" Wide x 4.5" High x 1.4" Deep
Actual unit may vary from picture

Because we are constantly seeking to improve our products, specifications are subject to change at any time.
 Specification Last Changed 04/06/2006

Transient Voltage Surge Suppressors By:

COAXIAL Models

"Power Quality is Our Business"

P.O. Box 330607
Ft. Worth, TX 76163
Phone: 817.483.8497
Fax: 817.572.2242
www.sinetamer.com

The Coaxial Series devices are designed to protect Data and signal transfer circuits, LANs operating Thin Ethernet / ThinNet (10Base2), Token Ring (802.5), 802.3, CCTV, CATV, cable TV, Radio Frequency Receiving Equipment, coax Satellite Systems, and a wide variety of similar circuits using coaxial connections This device is connected in series using common BNC, F, N, or UHF coax connectors, making your installation a breeze. A ground lug is provided on the side of the unit to insure a low impedance ground discharge path.

The unique design of these devices makes them among the most versatile TVSS devices on the market with superior performance specs and a warranty that is second to none.

GENERAL

Description:	Series connected transient voltage surge suppressor with **O**ptimal **R**esponse **N**etwork™ circuitry for use on a wide variety of circuits using coaxial connections.
Application:	Data and signal transfer circuits, LANs operating Thin Ethernet / ThinNet (10Base2), Token Ring (802.5), 802.3, CCTV, CATV, cable TV, Radio Frequency Receiving Equipment, Coax Satellite Systems, and a wide variety of similar circuits using coaxial connections.
Warranty:	**25 Years Unlimited Free Replacement**
Available Models:	Refer to table listed on second page

MECHANICAL

Enclosure:	Die cast (shielded) aluminum alloy
Connection Method:	Input – female, Output – female, Ground – grounding stud. DIN mounting foot (DIN option)
Shipping Weight:	**<** 1 lbs

CIRCUITRY

Circuit Design:	Series wired hybrid low capacitance design using our **O**ptimal **R**esponse **N**etwork™ design to provide lowest possible let-through-voltages. All suppression circuits are encapsulated in our high dielectric compound to assure long component life and complete protection from the environment and/or vibration. (HP models Excluded)
Protection Modes:	L-G (Common Mode)

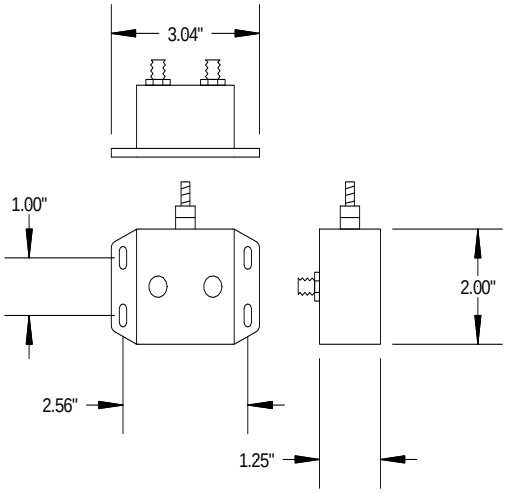
PERFORMANCE

Maximum Continuous Operating Voltage:	
Maximum Continuous Operating Current:	Refer to table listed on second page
Frequency Range:	
Maximum Data Rate:	
Series Resistance:	2 Ohms for HP type models, 0 Ohms for all others
Peak Surge Current per Pair:	10 kA
Response Time:	**<** 1 ns

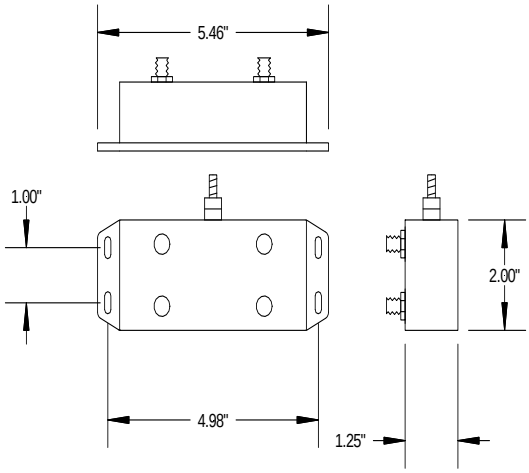
Our manufacturing facility is also one of the few in the industry to be ISO-9001 certified by National Quality Assurance USA.

Maximum Continuous Operating Voltage Current and Maximum Data Transmission Rate					Let-Through Voltages Using ANSI/IEEE B3/C1 Impulse Wave 6 kV, 3 kA
Model	**MCOV**	**MCOC**	**Maximum Data Transmission Rate**	**Frequency Range**	
ST-COAX-F-HP	15 VDC	500 mA	150 Mbps	DC to 1.5 GHz	98 V
ST-COAX-BNC-HP	15 VDC	500 mA	150 Mbps	DC to 1.5 GHz	
ST-COAX-F-HP-2	15 VDC	500 mA	150 Mbps	DC to 1.5 GHz	
ST-COAX-BNC-HP-2	15 VDC	500 mA	150 Mbps	DC to 1.5 GHz	
ST-COAX-F	60 VDC	500 mA	≤ 150 Mbps	≤ 1.5 GHz	251 V
ST-COAX-BNC	60 VDC	500 mA	≤ 150 Mbps	≤ 1.5 GHz	
ST-COAX-F-2	60 VDC	500 mA	≤ 150 Mbps	≤ 1.5 GHz	
ST-COAX-BNC-2	60 VDC	500 mA	≤ 150 Mbps	≤ 1.5 GHz	
ST-N-COAX	90 VDC	500 mA	≤ 150 Mbps	≤ 1.5 GHz	< 300 V
ST-F-COAX-TV	60 VDC	500 mA	≤ 85 Mbps	≤ 850 MHz	251 V

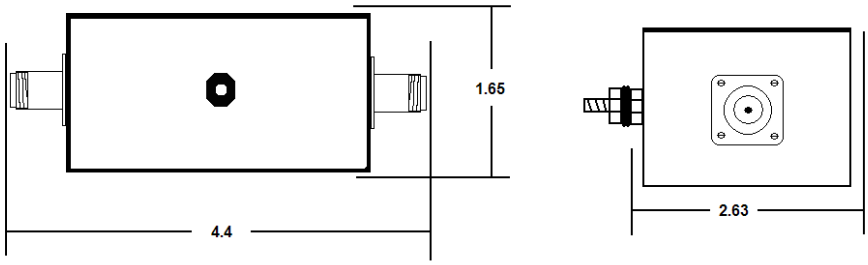
Single port coax model



Dual port coax model



Type "N" or UHF type connectors



Actual unit may vary from units pictured

Our manufacturing facility is also one of the few in the industry to be ISO-9001 certified by National Quality Assurance USA.

Because we are constantly seeking to improve our products, specifications are subject to change at any time.

Transient Voltage Surge Suppressors By:

Individual Equipment, Series II Circuit Protection

Made in the USA

"Our Name Says It All"

S-FSP2-2N4-P

Parallel Wired AC Unit

P.O. Box 330607
Ft. Worth, TX 76163
Phone: 817.483.8497
Fax: 817.572.2242
www.sinetamer.com

The Individual Equipment series connected devices provide improved protection for your equipment. These devices are intended for single circuit applications at locations feeding sensitive/critical equipment for voltages up to 480 VAC. Our individual component fused design is extremely effective in virtually eliminating transients generated inside the facility and is an absolute must on circuits feeding critical microprocessor based equipment. The devices also protect critical equipment from damage from externally generated surges such as lightning since the products boast a 20 kA per mode / 60 kA total peak surge current rating.

Its compact size makes installation a breeze.

GENERAL

Description:	Series connected transient voltage surge suppressor with encapsulated **O**ptimal **R**esponse **N**etwork™ circuitry (20 kA per mode / 60 kA total peak surge current).
Application:	Designed for use at ANSI/IEEE medium exposure levels to protect sensitive/critical loads fed by a single electrical circuit.
Warranty:	

MECHANICAL

Enclosure:	Plastic, UL 94V-5VA (UL's highest possible fire rating)
Mounting:	Double-sided sticky tape / Strapping material. Din rail mounting feet (DIN option)
Connection Method:	Wire connections 2 Phase wires (Black) and one Ground wire (Green)
Shipping Weight:	**<** 1 lbs

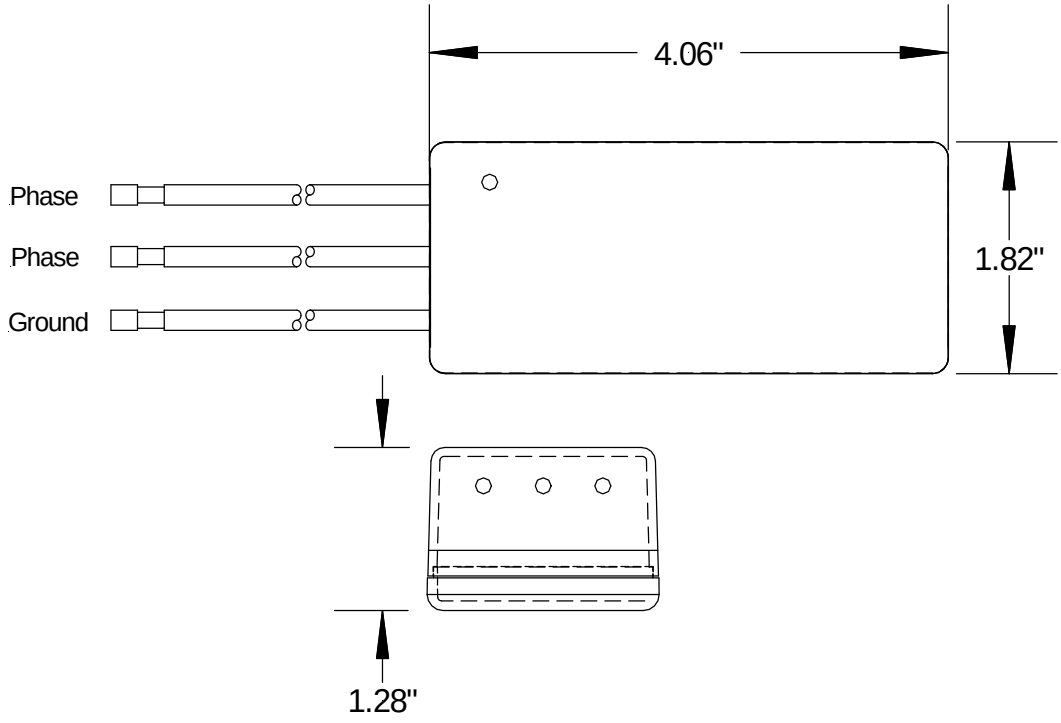
ELECTRICAL

Circuit Design:	Parallel connected hybrid design incorporating discrete all mode protection and utilizing our encapsulated **O**ptimal **R**esponse **N**etwork™ design. All suppression circuits are encapsulated in our high dielectric compound to promote long component life and protection from the environment and/or vibration. All circuits include Phase Level Fusing / Thermal Fusing.
Protection Modes:	Dedicated protection circuitry for every possible mode. Discrete L-L (Normal Mode), and Discrete L-G (Common Mode)
Input Power Frequency:	50-420 Hz
Circuit Diagnostics:	Green LED, normally on.
Circuit Interrupt:	External (see installation instructions for details).

We are the premier customer service oriented company in the industry as demonstrated by being awarded the 2006 TVSS Customer Value Enhancement Award from Frost & Sullivan. Our manufacturing facility is also one of the few in the industry to be ISO-9001 certified by National Quality Assurance USA.

LET-THROUGH VOLTAGE PERFORMANCE AND ELECTRICAL SPECIFICATIONS				
Model	**MCOV**	**Mode**	**ANSI/IEEE C62.41.1 & .2-2002 and C62.45-2002 Let-through Voltage Test Results**	
			Cat A 30 Ω 100 kHz Ring Wave 6 kV 200 A @ 90° Phase Angle	**Cat B, 2 Ω Impulse Wave 6 kV / 3 kA @ 90° Phase Angle**
S-FSP2-2N4-P	550 V 550 V	L-L L-G	925 V 925 V	1400 V 1400 V
Let-Through Voltage Test Environment: Dynamic (D) or Static (S), positive polarity. All voltages are peak (±10%). Time Base is 10 µs. 180° phase angle voltages are measured form the zero crossing, 90° phase angle voltages are measured from the positive peak of the sine wave to the positive peak of the surge indicating actual excess voltage let through. All tests were performed with the device connected in series simulating actual installation.				

Options (Suffix)	
Designator:	**Feature:**
LP	Remotely mounted NEMA-4X LED(s)
Special Options	
DIN	DIN rail mounting
P	Parallel connected (The P suffix replaces the amperage)
WX	NEMA 4X housing (requires separate enclosure)
Special lead lengths are available upon request (Ex.: -12IN = 12" leads)	



Actual unit may vary from picture.

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Transient Voltage Surge Suppressors By:

ST-PDB5

Telecommunication Lines Protection - Punch Down Block Device

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

"Power Quality is our Only Business"

P.O. Box 330607
Ft. Worth, TX 76163
Phone: 817.483.8497
Fax: 817.572.2242
www.sinetamer.com

The Series ST-PDB5 device is designed to protect voice grade telephone lines, fax lines, modem lines or ISDN lines from damage due to surges. This device is intended for installation at the point of demarcation close to the building ground so as to facilitate ground wire connection to the same point as the electrical system ground.

This device is designed to protect up to five paired lines. Connection is accomplished by punching the pairs down with a standard punchdown tool, making your installation a breeze. A ground lug is provided on the unit to help insure a low impedance ground path.

The unique design of the S-PDB5 device makes it among one of the most versatile TVSS devices on the market with superior performance specs and a warranty that is second to none.

GENERAL

Description:	Series wired transient voltage surge suppressor with encapsulated **O**ptimal **R**esponse **N**etwork™ circuitry for protection of telecommunications circuits.
Application:	Designed for use on Standard 3002-C2 unconditioned voice grade lines, fax lines, modem lines or ISDN lines to protect all telecommunication system equipment from damaging transients generated outside that facility on the Central Office cable.
Warranty:	**25 Years Unlimited Free Replacement**

MECHANICAL

Enclosure:	Plastic, UL 94V-0
Mounting:	External mounting feet. DIN rail mounting feet (DIN option)
Connection Method:	Lines: standard IDC terminals (26 AWG wire min – 22 AWG wire max) Ground: Wire clamping box terminal lug (12 AWG wire min - 6 AWG wire max)
Shipping Weight:	< 2 lbs

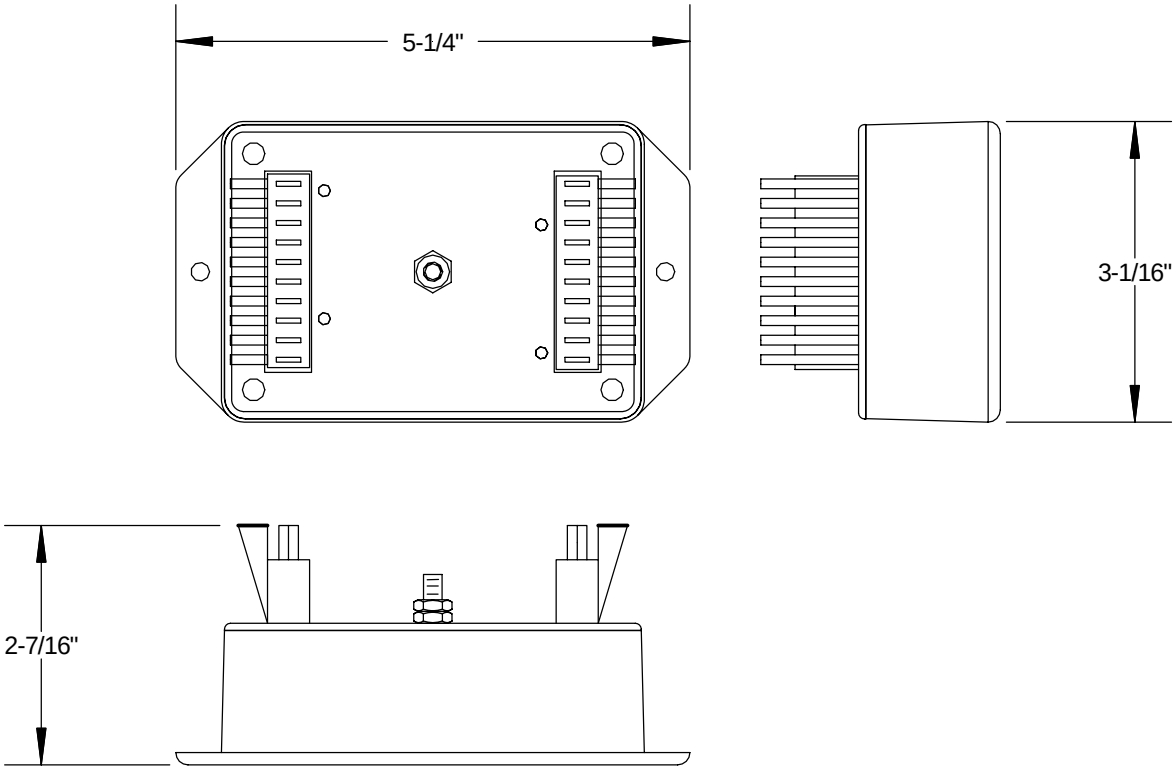
CIRCUITRY

Circuit Design:	Series wired, parallel connected hybrid design incorporating discrete all mode protection and utilizing our encapsulated **O**ptimal **R**esponse **N**etwork™ design to provide lowest possible let-through-voltages. All suppression circuits are low capacitance and low impedance and are encapsulated in our high dielectric compound to promote long component life and protection from the environment and/or vibration.
Protection Modes:	Dedicated protection components and circuitry for each mode. Discrete Tip-to-Ring (Normal Mode) and Tip-Ground and Ring-Ground (Common Mode)

PERFORMANCE

Maximum Continuous Operating Voltage:	130 Vrms Tip-Ring, Tip-Ground and Ring-Ground
Maximum Data Rate:	Up to 100 kbps
Let-Through-Voltage:	**<** 420 Volts at B3/C1 Impulse (6 kV / 3 kA, combination wave) T-R, T/R-G.
Peak Surge Current per Pair:	30 kA per pair
Series Resistance:	Zero Ohms per wire

Let-Through-Voltage Test Environment	
ANSI/IEEE C62.36-2000, C62.41.2-2002, C62.45-2002 Unpowered, Positive Polarity. All voltages are peak (±10%)	
Let-Through-Voltage Tests:	
Test Mode	**Test Category B3/C1 Impulse Wave 6 kV 3 kA**
T-R	**<** 420 V
T/R-G	**<** 420 V



Actual unit may vary from picture

Transient Voltage Surge Suppressors By:

AC Residential Panel Unit

ST-R120/240

Dedicated Protection Components And Circuitry For Each Mode

Made in the USA

"Power Quality is our Business"

P.O. Box 330607
Ft. Worth, TX 76163
Phone: 817.483.8497
Fax: 817.572.2242
www.sinetamer.com

The ST-R120/240 is a general use surge suppressor designed for Single Phase 120/240 Volt AC residential service disconnects, service entrance panels and sub panels. This model utilizes standard suppression components designed to maximize performance, life span, and safety. Individual suppression component level thermal fusing maximizes safety, while allowing the product to perform with optimal results.

The small size of this product allows maximum application flexibility and ease of installation by a licensed electrician. The product also features circuit status indication through a normally on, suppression good LED. The product provides premium protection for residential and light commercial panel loads. When combined with other protection products such as point-of use, telephone and cable protection, these products provide a complete system, best practice, approach to surge protection.

We believe that we offer the most versatile TVSS devices on the market with performance specs that are superior to our competitors and a warranty that is second to none.

GENERAL

Description:	Parallel connected, fixed clamping type, transient voltage surge suppressor utilizing encapsulated **O**ptimal **R**esponse **N**etwork™ circuitry, which provides for low Let-Through Voltages.
Application:	Designed for use at ANSI/IEEE location categories C, B and A exposure levels. Designed to protect all types of loads fed from disconnects, service entrance panels, and sub-panels.
Manufacturer Qualification:	ISO-9001
Warranty:	**15 Years Unlimited Free Replacement**

MECHANICAL

Enclosure:	ABS Plastic, UL94-5VA (UL's Best Plastic Flame Rating)
Mounting:	Conduit fitting (internally threaded) and external mounting feet.
Connection Method:	#10 stranded wire.
Shipping Weight:	3lbs

ELECTRICAL

Circuit Design:	Parallel configured, individual component and phase level fused, threshold clamping design, circuit encapsulation to maintain circuit integrity.
Protection Modes:	Dedicated protection components and circuitry for each mode. Discrete L-L (Normal Mode), and Discrete L-G (Common Mode).
Input Power Frequency:	50-420Hz (60Hz typical)
Response Time:	<1 nanosecond
Circuit Diagnostics:	Super Bright LED, 1 per phase, normally on.
Circuit Interrupt:	External (see installation instructions for details).

Because we are constantly seeking to improve our products, specifications are subject to change at any time.

Transient Voltage Surge Suppressors By:

AC Residential Panel Unit

ST-R120/240

Dedicated Protection Components And Circuitry For Each Mode

SineTamer Energy Control Systems

Made in the USA

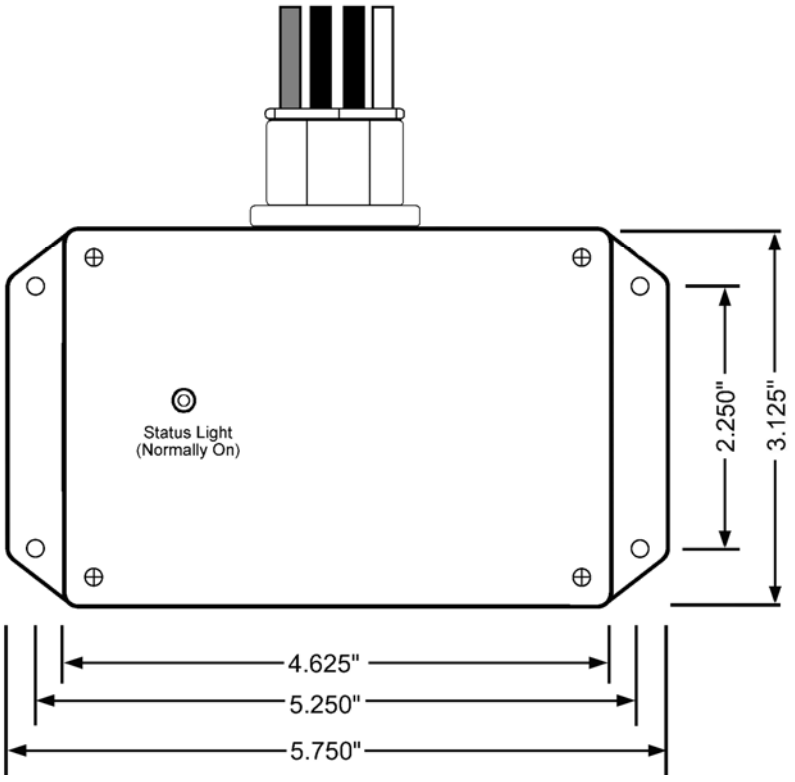
"Our Name Says It All"

P.O. Box 330607
Ft. Worth, TX 76163
Phone: 817.483.8497
Fax: 817.572.2242
www.sinetamer.com

Model	Circuit Type	Mode	MCOV	Peak Surge Current (Amps) Per Mode	ANSI/IEEE C62.41 & .45 Let-Through Voltage	
					A3 Ring Wave 6 kV, 200 A 90° Phase Angle	B3/C1 Impulse Wave 6 kV, 3 kA 90° Phase Angle
ST-R120/240	120/240 V, Split Ø (3 wire + ground)	L-N	150	40,000	535	650
		N-G	150	40,000	930	1090
		L-N			510	640
		N-G			930	1110

Let-Through Voltage Test Environment using test parameters as defined by Underwriters Laboratory: Dynamic (D) or Static (S), Positive Polarity. Time base=10µs. All voltages are peak (±10%), 90° phase angle voltages are measured from the zero crossing to the peak of the surge. All tests were performed with 6 inches of lead length outside the device enclosure which simulates actual "as installed" performance.

Single-pulse, surge current testing for all modes at rated currents, is in compliance with NEMA LS 1-1992. Single-pulse, surge current capacities of 200,000 amps or less are determined by single-unit testing of all components within each mode. Present industry test equipment limitations require testing of individual components or sub-assemblies within a mode for single-pulse, surge current capacities over 200,000 amps.



Because we are constantly seeking to improve our products, specifications are subject to change at any time.

Transient Voltage Surge Suppressors By:

ST-RSE series

Paralleled Wired AC Unit with All-Mode Protection

"Power Quality is our Business"

P.O. Box 330607
Ft. Worth, TX 76163
Phone: 817.483.8497
Fax: 817.572.2242
www.sinetamer.com

The SineTamer© ST-RSE device provides outstanding transient protection for a device of its type. These devices are intended for single 208/380/480 VAC wye or delta circuit applications at locations feeding sensitive/critical equipment. It is extremely effective in limiting transients generated inside the facility and is an absolute must on circuits feeding critical microprocessor based equipment. It boasts a robust 20kA per mode peak surge current rating.

This economical device is unique in that it is designed as a stand-alone surge suppression device and requires no special enclosure when used outside an existing enclosure or cabinet. Its compact size makes installation a breeze and the warranty is the best in the industry. Add to all that, completely encapsulated **O**ptimal **R**esponse **N**etwork™ circuitry, and you get a device that defines effective and reliable surge suppression.

We believe that we offer the most versatile TVSS devices on the market with performance specs that are superior to our competitors and a warranty that is second to none.

GENERAL

Description:	Series wired parallel-connected transient voltage surge suppressor with encapsulated **O**ptimal **R**esponse **N**etwork™ circuitry (20kA per mode peak surge current.)
Application:	Designed for use at ANSI/IEEE Category A with susceptibility up to medium exposure levels to protect sensitive/critical loads fed by a single 208/380/480 V 3 phase AC circuit.
Warranty:	**25 Years Unlimited Free Replacement**

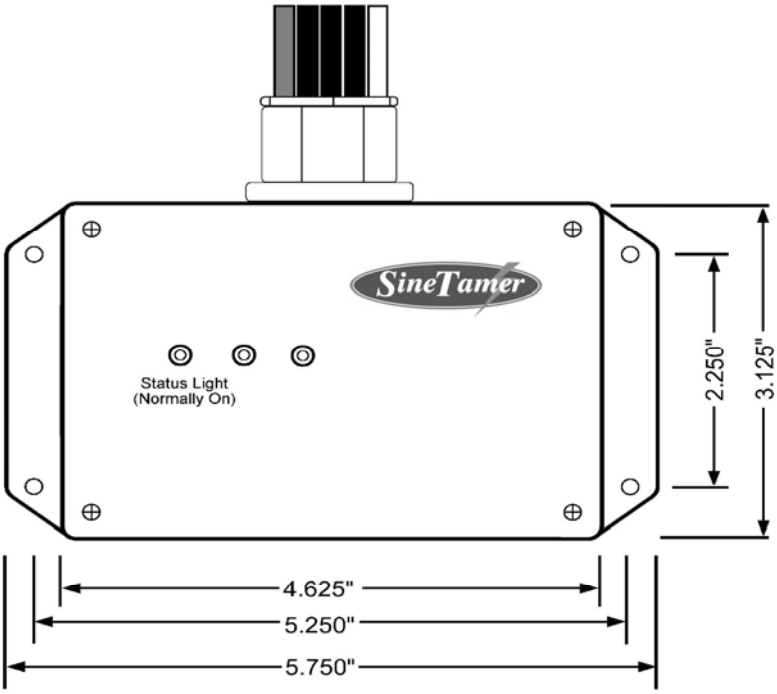
MECHANICAL

Enclosure:	Plastic, UL 94V
Mounting:	External mounting feet.
Connection Method:	Wires - #10 stranded wire // 2.60 mm dia.
Shipping Weight:	≈ 2 lbs

ELECTRICAL

Circuit Design:	Parallel connected hybrid design incorporating discrete all mode protection and utilizing our encapsulated **O**ptimal **R**esponse **N**etwork™ circuitry design to provide lowest possible let-through-voltages. All suppression circuits are completely encapsulated in our exclusive compound to assure long component life and complete protection from the environment and/or vibration.
Protection Modes:	Protection components and circuitry for each mode. Normal Mode and Common Mode
Input Power Frequency:	50-60Hz
Maximum Continuous Operating Current:	60 Amps AC
Response Time:	<1 nanosecond
Circuit Diagnostics:	LED – 1 per phase, normally on.
Circuit Interrupt:	Thermal and Current fusing integral to the unit
Options:	Din rail mountable – specify **-DIN** as suffix.

Because we are constantly seeking to improve our products, specifications are subject to change at any time.



MEASURED LIMITING VOLTAGE PERFORMANCE AND ELECTRICAL SPECIFICATIONS

Model	MCOV	Mode	ANSI/IEEE C62.41 & C62.45 Let-Through Voltage Test Results		
			A3 6kV, 200A 100KHz Ring Wave 90º Phase Angle	B3/C1 6kV, 3kA Impulse Wave 90º Phase Angle	C3 20kV, 10kA Impulse Wave 90º Phase Angle
ST-RSE1S1	150 L-N 300 L-L 150 L-G 150 N-G	L-N L-L L-G N-G	535 930 930 510	650 1110 1090 640	1,000 V 1,200 V 900 V 900 V
ST-RSE3Y1	150 L-N 300 L-L 150 L-G 150 N-G	L-N L-L L-G N-G	535 930 930 510	650 1110 1090 640	1,000 V 1,200 V 900 V 900 V
ST-RSE3Y2	320 L-N 550 L-L 320 L-G 320 N-G	L-N L-L L-G N-G	475 620 620 475	585 V 875 V 592 V 590 V	1200 V 1400 V 1100 V 1400 V
ST-RSE3N2	320 L-L 320 L-G	L-L L-G	470 470	575 V 575 V	1200 V 1200 V
ST-RSE3N4	550 L-L 550 L-G	L-L L-G	625 625	825 V 825 V	1400 V 1400 V

***Measured Limiting Voltage (Let-Through) Test Environment:** Dynamic (D) or Static (S), positive polarity. All voltages are peak (±10%). Time Base is 1ms. 180° phase angle voltages are measured form the zero crossing, 90° phase angle voltages are measured from the positive peak of the sine wave to the positive peak of the surge indicating actual excess voltage let through. All tests were performed with the device connected in series simulating actual installation.

****Suppressed Voltage Test Environment** using test parameters as defined by Underwriters Laboratory: Dynamic (D) or Static (S), Positive Polarity. Time base=10μs. All voltages are peak (±10%), 90E phase angle voltages are measured from the zero crossing to the peak of the surge. All SineTamer products are manufactured exclusively for Energy Control Systems.

Because we are constantly seeking to improve our products, specifications are subject to change at any time.

Transient Voltage Surge Suppressors By:

ST-SPT120-15-1T1V

Series Wired AC Unit with Sine Wave Tracking and Discrete All-Mode Protection with Telecom / Video line

SineTamer Energy Control Systems

P.O. Box 330607
Ft. Worth, TX 76163
Phone: 817.483.8497
Fax: 817.572.2242
www.sinetamer.com

The Series ST-SPT120-15-1T1V devices provide the absolute best ring wave transient protection available for a device of its type. These devices are intended for single 120 VAC circuit applications at locations feeding sensitive/critical equipment combined with a line designed to protect standard voice grade telephone lines. It is extremely effective in limiting transients generated inside the facility and is an absolute must on circuits feeding critical microprocessor based equipment. It boasts a robust 20 kA per mode peak surge current rating.

We believe that we offer the most versatile TVSS devices on the market with superior performance specs and a warranty that is second to none.

GENERAL

Description:	Series wired, parallel connected transient voltage surge suppressor with encapsulated **O**ptimal **R**esponse **N**etwork™ circuitry (20 kA per mode peak surge current) and **E**nhanced **S**inewave **T**racking™ for virtual elimination of ring wave type transients.
Application:	Series: Designed for use at ANSI/IEEE Category A with susceptibility up to medium exposure levels to protect sensitive/critical loads fed by a single 120 VAC circuit. Telco/Coax: Designed for use on Standard 3002/C2 unconditioned voice grade lines, fax lines, modem lines and **ISDN** lines to protect data transmission system equipment from damaging transients generated outside of the facility.
Warranty:	**25 Years Unlimited Free Replacement**

MECHANICAL

Enclosure:	Plastic, UL 94V-5VA
Mounting:	External mounting feet.
Connection Method:	Series: Screw terminals at both the input and output sides of the device.
Shipping Weight:	< 4 lbs

ELECTRICAL

Circuit Design:	Series wired, parallel connected hybrid design incorporating discrete all mode protection and utilizing our encapsulated **O**ptimal **R**esponse **N**etwork™ design and **E**nhanced **S**inewave **T**racking™ circuitry to provide lowest possible let-through-voltages. All suppression circuits are encapsulated in our high dielectric compound to promote long component life and protection from the environment and/or vibration.
Protection Modes:	Series: Dedicated protection components and circuitry for each mode. Discrete L-N (Normal Mode), and Discrete L-G, N-G (Common Mode)
Input Power Frequency:	50-60 Hz

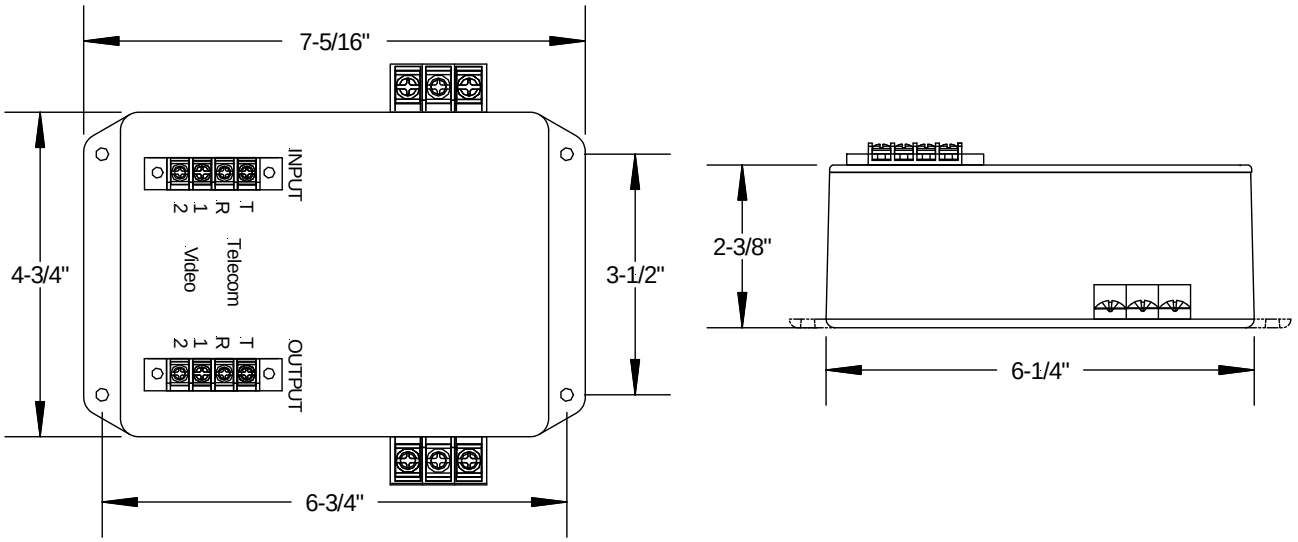
PERFORMANCE	SERIES	TELECOM	VIDEO (Twisted Pair)
Maximum Continuous Operating Voltage:	150 Vrms	130 Vrms	75 Vpk
Maximum Continuous Operating Current:	15 A	5 A	500 mA
Series Resistance:	0 Ohms	0 Ohms	0 Ohms
Maximum Data Rate / Freq:	50/60 Hz	Up to 100 Kbps	≤ 150 Mbps / 1.4 GHz
Peak Surge Current per Pair:	60 kA total	30 kA	10 kA L-G
Number of Lines:	1 curcuit	1 Pair	1 Pair

Because we are constantly seeking to improve our products, specifications are subject to change at any time.

MEASURED LIMITING VOLTAGE PERFORMANCE AND ELECTRICAL SPECIFICATIONS				
Model	MCOV	Mode	*ANSI/IEEE C62.41-1991 Measured Limiting Voltage Test Categories	
			Cat A, 30 Ω 100 kHz Ring Wave 2 kV / 67 A @ 270° Phase Angle	**Cat B, 2 Ω Impulse Wave 6 kV / 3 kA @ 90° Phase Angle**
S-SPT120-15-1T1V	150 P-N	P-N	25 (D)	316 (D)
	150 P-G	P-G	50 (D)	429 (D)
	150 N-G	N-G	32 (S)	498 (S)

***Measured Limiting Voltage (Let-Through) Test Environment:** Dynamic (D) or Static (S), positive polarity. All voltages are peak (±10%). Time Base is 1ms. 180° phase angle voltages are measured form the zero crossing, 90° phase angle voltages are measured from the positive peak of the sine wave to the positive peak of the surge indicating actual excess voltage let through. All tests were performed with the device connected in series simulating actual installation.

Let-through Voltage Test Environment ANSI/IEEE C62.45 & C62.41; Static, Positive Polarity All voltages are peak (±10%)		
Test Mode		Test Category B3/C1 Impulse Wave 6 kV, 3 kA
TELE	T/R	< 420 V
	T/R -G	< 420 V
VIDEO	L-G	251 V



Actual unit may very from picture.

Because we are constantly seeking to improve our products, specifications are subject to change at any time.

Transient Voltage Surge Suppressors By:

ST-SPx###-x

Series Wired AC Unit with Sine Wave Tracking and Discrete All-Mode Protection

SineTamer Energy Control Systems

Made in the USA

c UL us LISTED 1449 Second Edition

"Power Quality is our Only Business"

P.O. Box 330607
Ft. Worth, TX 76163
Phone: 817.483.8497
Fax: 817.572.2242
www.sinetamer.com

The ST-SPx###-x devices provide the most unique transient protection available for serial connected individual equipment applications. Models are available in many electrical configurations for single phase configurations. These products provide protection at locations feeding sensitive, mission critical equipment. These models are extremely effective in limiting transients generated at the facility and are strong enough for first line protection of connected equipment. All models are rated with a robust 60 kA per phase peak surge current rating.

Its compact size makes installation a breeze and the 25 Year warranty is the best in the industry. Additional options include: Form C Dry Relay Contacts, RJ14 ISDN Grade Telecom Circuit Protection. (Other options are available upon request.)

GENERAL

Description:	Series connected transient voltage surge suppressor with encapsulated **O**ptimal **R**esponse **N**etwork™ circuitry (20 kA per mode / 60 kA total peak surge current) and **E**nhanced **S**inewave **T**racking™ for virtual elimination of ring wave type transients.
Application:	Designed for use at ANSI/IEEE Categories A, B, and C with susceptibility up to all exposure levels to protect sensitive/critical loads fed by a single electrical circuit.
Warranty:	**25 Year Unlimited Free Replacement**
Unit Listings:	UL 1449 Second Edition and CUL (120 VAC model only)

MECHANICAL

Enclosure:	Plastic, UL 94V-5VA (UL's highest possible fire rating)
Mounting:	External mounting feet. Din rail mounting feet (DIN option)
Connection Method:	3-position screw terminal strips on the line / equipment sides of the device. (wire connections are optional)
Shipping Weight:	**<** 2 lbs

ELECTRICAL

Circuit Design:	Series connected hybrid design incorporating discrete all mode protection and utilizing our encapsulated **O**ptimal **R**esponse **N**etwork™and optional **E**nhanced **S**inewave **T**racking™ circuitry design to provide lowest possible let-through-voltages. All suppression circuits are encapsulated in our high dielectric compound to assure long component life and complete protection from the environment and/or vibration.
Protection Modes:	Dedicated protection circuitry for every possible mode. Discrete L-N (Normal Mode), and Discrete L-G, N-G (Common Mode)
Input Power Frequency:	50-60 Hz
Current & Voltage Configurations:	3, 5, 15, 30, & 60 Amps with various models up to 480 V AC/DC (Other voltages & configurations available upon request)
Peak Surge Current:	20 kA per mode /60 kA total PSC
Response Time:	**<** 1 ns
Circuit Diagnostics:	Green LED, normally on.
Circuit Interrupt:	External (see installation instructions for details).

Because we are constantly seeking to improve our products, specifications are subject to change at any time.

LET-THROUGH VOLTAGE PERFORMANCE AND ELECTRICAL SPECIFICATIONS

Model	MCOV	Mode	*ANSI/IEEE C62.45 & C62.41 Let-Through Voltage Test Categories	
			A1 Ring Wave 6 kV, 100 A, 100 kHz RW 90° Phase Angle	B3/C1 Impulse Wave 6 kV, 3 kA 90° Phase Angle
S-SPx120-x	150	P-N	30 (D)	289 (D)
	150	P-G	58 (D)	380 (D)
	150	N-G	33 (S)	550 (S)
S-SPx240-x	320	P-N	66 (S)	548 (S)
	320	P-G	100 (S)	558 (S)
	320	N-G	33 (S)	655 (S)
S-SP-480-x	550	L-L	75 (S)	725 (S)
	550	L-G	75 (S)	725 (S)

***Let-Through Voltage Test Environment:** All tests are dynamic except for those marked (S) which are static. All voltages are peak (±10%). Tests performed at 270 degrees are measured from the insertion point to the peak of the surge. Tests performed at 90 degrees are measured from the peak of the AC sine wave to the peak of the surge. All tests were performed with the device connected in series simulating actual installation. Time base=10μs.

Model Number Selection Format

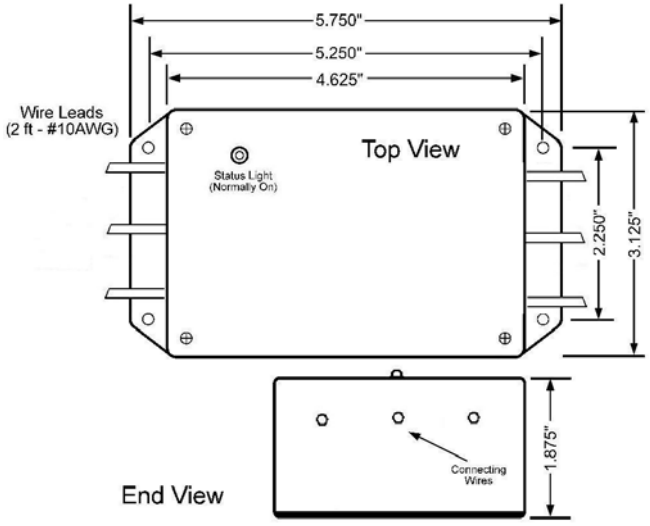
Configuration	Voltage
ST-SPT-x – Terminals, Sinewave Tracking	5 to 480 (AC) (480 – W only) 5 to 380 (DC)
ST-SP-x – Wires, Sinewave Tracking	Specify DC in model by putting "DC" after number
Remove T from model # – Wires instead of terminals	Models may reflect commonly used voltages or increments of 10.

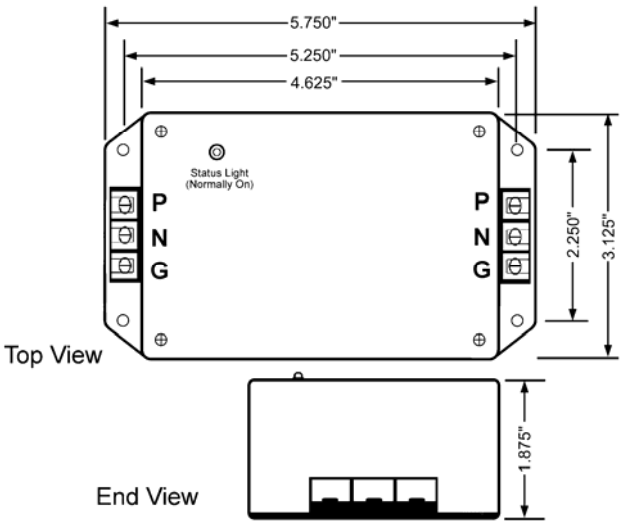
Typical Model Breakdown	Amperages (-x)
S-SPT120-30 (Sine Wave Tracking, Terminal Connected, 120 VAC, and 30 Amps)	5 15 30 60

Options (-y Suffix)

Designator:	Feature:
AC	Alarm Option
C	Dry Relay Contacts-
LP	Remotely mounted NEMA-4X LED(s)
N	No (N-G) SWT Filter
Rx	Remote Diagnostics (x = 1 or 2); 1 = open frame DRC/LED pcb only, 2 = # 1 above in NEMA-1 enclosure.
Special Options	
DIN	DIN rail mounting
K	Kelvin Connections
RJnn	Modular Telco/LAN (nn = 11, 14, 45, etc.)
P	Parallel connection
T	130 Vmcov MOVs (120 VAC models only)
WX	NEMA 4X housing

Special lead lengths are available upon request (Ex.: -48IN = 48" leads)





Actual unit may vary from picture.

Because we are constantly seeking to improve our products, specifications are subject to change at any time.

Transient Voltage Surge Suppressors By:

ST-TD##-16

Network Data Circuit protection device with Discrete All-Mode Protection

SineTamer

Made in the USA

"Power Quality is our Business"

P.O. Box 330607
Ft. Worth, TX 76163
Phone: 817.483.8497
Fax: 817.572.2242
www.sinetamer.com

These Data Line devices are designed to protect data transmission circuits. These devices are intended for installation near the equipment to be protected and mounted as close to the equipment as possible so as to allow for a common grounding point for grounding.

This device is available for up to sixteen wire data line connections (8 pair) accomplished by using the terminal strips provided, making your installation a breeze. Ground lugs are provided on the face of the unit to insure a low impedance ground discharge path.

The unique design of these devices makes them among the most versatile TVSS devices on the market with superior performance specs and a warranty that is second to none.

GENERAL

Description:	Series wired transient voltage surge suppressor with encapsulated **O**ptimal **R**esponse **N**etwork™ circuitry for protection of data circuits.
Application:	Designed for use data, signal and current loop circuits to protect data transmission system equipment from damaging transients generated between terminals and equipment in the data collection/transmission system.
Warranty:	**25 Years Unlimited Free Replacement**

MECHANICAL

Enclosure:	Plastic, UL 94V-0
Mounting:	External mounting feet. DIN mounting feet (DIN option)
Connection Method:	Wire clamping box terminals located at the input and output sides of the device. Wire size: Lines #18-22 AWG, Ground #6-12 AWG.
Shipping Weight:	**<** 3 lbs

CIRCUITRY

Circuit Design:	Series wired hybrid design incorporating discrete all mode protection and utilizing our encapsulated **O**ptimal **R**esponse **N**etwork™ design to provide lowest possible let-through voltages. All suppression circuits are encapsulated in our high dielectric compound to assure long component life and complete protection from the environment and/or vibration.
Protection Modes:	Dedicated protection components and circuitry for each mode. Discrete L-L (Normal Mode) and L-G,(Common Mode)

PERFORMANCE

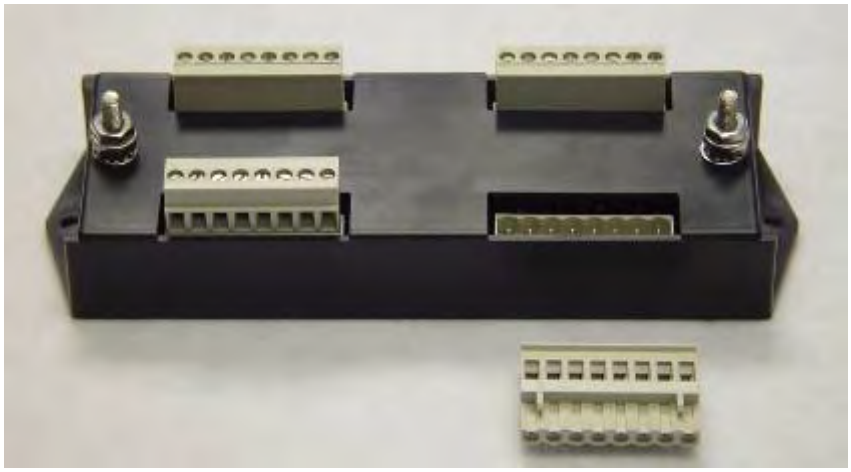
Maximum Continuous Operating Voltage:	7.5, 15, 36, 54, and 140 V
Maximum Continuous Operating Current:	500 mA
Series Resistance:	5 Ω per wire: 2 & 10 Mbps models; 0 Ω's per wire: 100 Mbps models
Maximum Data Rate:	2, 10, or 100 Mbps
Peak Surge Current per Pair:	L-G 10 kA: 2 & 10 Mbps models; 1,500 Wpk per mode & 3,000 Wpk Total for 100 Mbps models.
Response Time:	**<** 1 ns
Options:	Use suffix -X (10 megabits) or -C (100 megabits, Cat 5)

Because we are constantly seeking to improve our products, specifications are subject to change at any time.

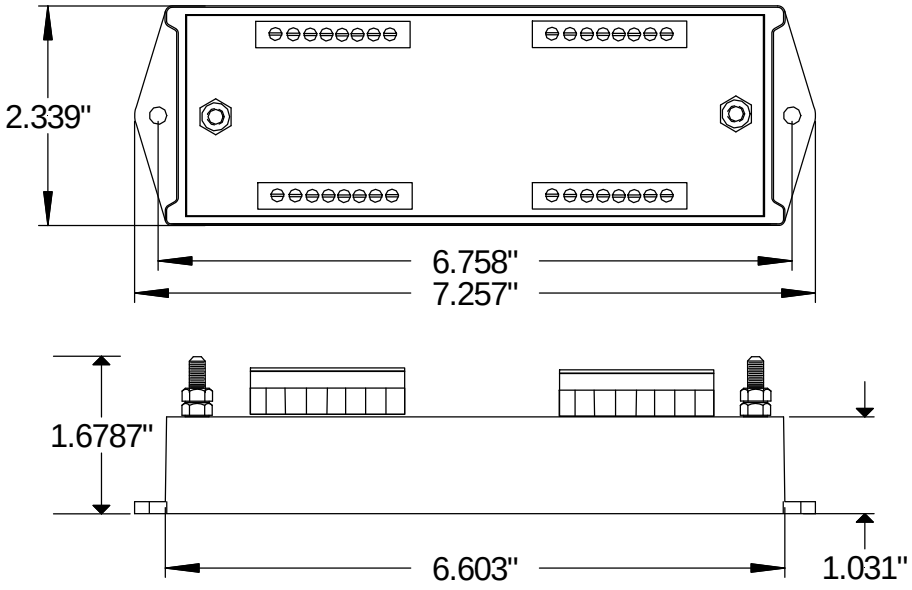
Let-Through Voltages Using ANSI/IEEE C62.45 & C62-41.1 / C62-41.2 Test Environment: Static, positive polarity. All voltages are peak (±10%).				
Model	**Maximum Continuous Operating Voltages**	**Maximum Continuous Operating Current**	**Test Mode**	**B3/C1 Impulse Wave 6 kV, 3 kA**
ST-TD5-nx	7.5 V 7.5 V	500 mA	L-G L-L	< 20 V < 20 V
ST-TD15-nx	15 V 15 V	500 mA	L-G L-L	< 30 < 30
ST-TD24-nx	36 V 36 V	500 mA	L-G L-L	< 40 V < 40 V
ST-TD53-nx	54 V 54 V	500 mA	L-G L-L	< 80 V < 80 V
ST-TD140-nx	140 V 140 V	500 mA	L-G L-L	< 160 V < 160 V

.

Notes: n = 8 or 16 circuit conductors. x = blank: 2 Mbps, x = X: 10 Mbps, x = C: 100 Mbps.



Actual unit may vary from the picture.



Transient Voltage Surge Suppressors By:

ST-WM1P1-S

Wall Mount Surge Activity Counter

Made in the USA

"Our Name Says It All"

P.O. Box 330607
Ft. Worth, TX 76163
Phone: 817.483.8497
Fax: 817.572.2242
www.sinetamer.com

The ST-WM1P1-S is a Single Outlet Surge Monitor designed to provide evidence of surge activity on an individual 120 VAC circuit via an electrical outlet. This device senses a current pulse as the surge is mitigated and removed from the electrical system. This kind of detection system means that only real damaging type surges are detected. In the event that surge activity is detected through this device, then it is highly recommended that the electrical system be outfitted with a quality Surge Protection System such as those provided by SineTamer.

GENERAL	
Description:	Single-circuit, point-of-use, For detection of surge activity on a single electrical outlet.
Application:	NEMA 5-15, 120 Vrms circuits feeding sensitive & general purpose loads

MECHANICAL	
Enclosure:	Plastic, UL 94V-0
Plug-Receptacle Type:	120 Volt, 15 Amp, NEMA 5-15P
Connection Method:	Direct, single plug-in
Shipping Weight:	**<** 1 lb.
Dimensions:	4" L, 2.125" W, 2.5" H

ELECTRICAL	
Voltage:	120 VAC
Input Power Frequency:	50-60 Hz

Transient Voltage Surge Suppressors By:

ST-WM1P2-S

Wall Mount Surge Activity Counter

Made in the USA

"Our Name Says It All"

P.O. Box 330607
Ft. Worth, TX 76163
Phone: 817.483.8497
Fax: 817.572.2242
www.sinetamer.com

The ST-WM1P2-S is a Single Outlet Surge Monitor designed to provide evidence of surge activity on an individual 240 VAC circuit via an electrical outlet. This device senses a current pulse as the surge is mitigated and removed from the electrical system. This kind of detection system means that only real damaging type surges are detected. In the event that surge activity is detected through this device, then it is highly recommended that the electrical system be outfitted with a quality Surge Protection System such as those provided by SineTamer.

GENERAL	
Description:	Single-circuit, point-of-use, For detection of surge activity on a single electrical outlet.
Application:	NEMA 6-15, 240 Vrms circuits feeding sensitive & general purpose loads

MECHANICAL	
Enclosure:	Plastic, UL 94V-0
Plug-Receptacle Type:	250 Volt, 15 Amp, NEMA 6-15P
Connection Method:	Direct, single plug-in
Shipping Weight:	**<** 1 lb.
Dimensions:	4" L, 2.125" W, 2.5" H

ELECTRICAL	
Voltage:	240 VAC
Input Power Frequency:	50-60 Hz

Supresores de transientes de sobrevoltaje por:

Unidades en panel para AC

Modelo LA-ST120

Componentes de proteccion dedicados y circuitados para cada modo

"Calidad de energia es nuestro negocio"

P.O. Box 330607
Fort Worth, TX 76163
Phono: 817.483.8497
Fax: 817.572.2242
www.sinetamer.com

La serie LA de SineTamer© reúnen una destacada y sin igual capacidad de supresión de transitorios para protección de la onda senoidal. Este dispositivo de gran duración fue previsto para propósitos generales y protección de cargas muy sensibles. Los LA-ST120 (800 Amp) son típicamente instalados en pequeños servicios de acometida, distribución y sub.-paneles de distribución. De tamaño compacto y caja no metálica, su diseño también le permite ser instalado directamente en paneles eléctricos y/o en equipos. Su capacidad de instalación interna le permite acortar al máximo el largo de los conductores, mejorando su eficiencia y funcionamiento. Los LA-ST120 son extremadamente efectivos en limitar transitorios generados internamente y son absolutamente eficientes en aplicaciones de paneles de alimentación en oficinas y/o equipos basados en microprocesadores.

Este económico y eficiente dispositivo tiene características que no son disponibles in dispositivos aun de mayor costo . Su tamaño compacto le permite una instalación muy fácil. Su operación **Libre de Mantenimiento** y sus **20 anos de garantía con reemplazo gratuito** contra cualquier anomalía eléctrica provee a sus usuarios de una gran tranquilidad.

DATOS GENERALES

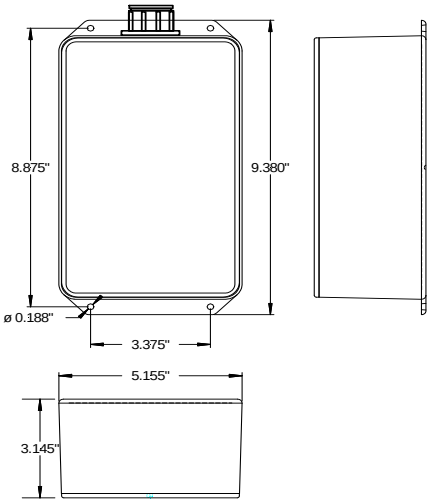
Descripción:	Supresor de transientes de sobrevoltaje de aplicación en paralelo, dispositivo que utiliza ambas tecnologías: manejo de transientes de alta energía y circuito de rastreo de la onda senoidal para virtual eliminación de transientes por impulso y oscilatorios. Diseñado para picos de corriente de 40 ka por modo / 120 ka por fase.
Aplicacion:	Diseñado para uso en las categorías ANSI/IEEE C, B y A con susceptibilidad para niveles de media exposición. Diseñado para proteger cargas sensibles y criticas alimentadas desde paneles de distribución, sub-paneles y/o paneles de equipos individuales.
Garantía:	**20 Anos libre de mantenimiento y con cambio gratuito.**
Calificaciones del Producto:	**Listed to UL1449 2nd Edition (Feb. 9, 2007 Rev.) by CSA, an NRTL, CSA MC#214804, UL1283 and CE Compliant, ISO 9001:2000, ANSI C62.72-2007**

CARACTERISTICAS MECANICAS

Caja:	Plástico ABS de alta resistencia
Montaje:	Dispositivo roscado de 1" y pie de montaje externo.
Método de conexión:	Conductores #10.
Peso de despacho:	≈ 2.75 Kilogramos

CARACTERISTICAS ELECTRICAS

Diseño del circuito:	Conectado en paralelo, internamente con fusibles térmicos, diseño híbrido incorporando un verdadero todos los modos de protección (10 modos para unidades trifasicas en estrella) y utilizando nuestro diseño de componentes encapsulados en resina de disipación para proveer una mayor durabilidad. Todos los circuitos de supresión son encapsulados en nuestro exclusivo compuesto para asegurar una larga vida a los componentes y completa protección en ambientes industriales contaminados, húmedos y/o con vibración.
Modos de protección:	Componentes de protección dedicados en cada modo. Verdadero L-N, L-L (Modo Normal), y verdadero L-G, N-G (Modo común). 10 modos en sistema trifásico en estrella.
Frecuencia:	50-60Hz constante (60Hz típico)
EMI/RFI Noise Attenuation:	40dB Max. from 1kHz to 10MHz (normal and common mode)
Circuitos de Diagnostico:	LED's súper brillantes, 1 por fase, normalmente encendidos. Contactos secos para monitoreo remoto standard.
Circuito Interruptor:	Externo e interno (Ver detalle de la instalación).
Fusibles:	Fusibles térmicos y fusibles de corriente para seguridad.



MEDICIONES Y LIMITACION DE VOLTAJE, FUNCIONAMIENTO Y ESPECIFICACIONES ELECTRICAS

Modelo	Configuración	MCOV	Pico de Corriente (Amps) Por Modo	Modos	ANSI/IEEE C62.41 & C62.45 Resultados de pruebas de voltaje remanente		
					A1 2kV, 67A 100KHz Ring Wave 270º Phase Angle	B3/C1 6kV, 3kA Impulse Wave 90º Phase Angle	C3 20kV, 10kA Impulse Wave 90º Phase Angle
LA-ST120-1P1C	120V, Monofásico (2 alambres + tierra)	150 L-N 150 L-G 150 N-G	40,000 L-N 40,000 L-G 40,000 N-G 120,000 Total	L-N L-G N-G	45 60 55	385 400 560	914 1025 1176
LA-ST120-1S1C	120/240V, Bifásico (3 alambres + tierra)	300 L-L 150 L-N 150 L-G 150 N-G	40,000 L-L 40,000 L-N 40,000 L-G 40,000 N-G 240,000 Total	L-L L-N L-G N-G	75 45 60 55	570 385 400 560	1119 914 1025 1176
LA-ST120-3Y1C	120/208V, 3ØY (4 alambres + tierra)	300 L-L 150 L-N 150 L-G 150 N-G	40,000 L-L 40,000 L-N 40,000 L-G 40,000 N-G 400,000 Total	L-L L-N L-G N-G	55 45 60 55	570 385 400 560	1119 914 1025 1176
LA-ST120-1P2C	240V, Monofasico Ø (2 alambres + tierra)	320 L-N 320 L-G 320 N-G	40,000 L-N 40,000 L-G 40,000 N-G 120,000 Total	L-N L-G N-G	60 80 55	560 590 965	1050 1262 1575
LA-ST120-3Y2C	220/380V, 3ØY 277/480V, 3ØY (4 alambres + tierra)	550 L-L 320 L-N 320 L-G 320 N-G	40,000 L-L 40,000 L-N 40,000 L-G 40,000 N-G 400,000 Total	L-L L-N L-G N-G	130 60 80 55	895 560 590 965	1344 1050 1262 1575
LA-ST120-3N2C	240V, 3∅Δ (3 Alambres + tierra)	320 L-L 320 L-G	40,000 L-L 40,000 L-G 280,000 Total	L-L L-G	60 75	590 590	1262 1262
LA-ST120-3N4C	380V, 3∅Δ 480V, 3∅Δ (3 alambres + tierra)	550 L-L 550 L-G	40,000 L-L 40,000 L-G 240,000 Total	L-L L-G	60 130	895 895	1344 1344
LA-ST120-3N6C	550V, 3∅Δ 660V, 3∅Δ (3 alambres + tierra)	750 L-L 750 L-G	40,000 L-L 40,000 L-G 240,000 Total	L-L L-G	160 140	1250 1290	1750 1690

Ambiente de prueba de voltaje remanente: Polaridad positiva. Tempo base=1ms. Todos los voltajes son picos (±10%). Voltajes transitorios son medidos desde el punto de inserción del transitorio en la onda al pico del transitorio. Todas las pruebas son dinámicas (voltaje aplicado) excepto N-G que es estático (no se aplica voltaje). Todas las pruebas son efectuadas con cables a 6 pulgadas de largo fuera de la caja del dispositivo lo cual simula una instalación real.

Los pulsos, las pruebas de picos de corriente para todos los modos son diseñadas, de acuerdo a la NEMA LS 1-1992. pulso simple, capacidad de pico de corriente de 200,000 amps o menos son determinados por unidades simples probando todos los componentes, componentes en cada modo. Actualmente la industria prueba las limitaciones requeridas probando individualmente los componentes o sub-unidades con un modo por simple impulso, capacidad de de pico de corriente sobre 200,000 amps.

Debido a que estamos constantemente mejorando nuestros productos, las especificaciones estan sujetas a cambios en cualquier momento. Ultimo cambio de especificaciones 03/08

Supresores de transientes de sobrevoltaje para: **Unidades en panel para AC** ***Modelo LA-ST180***

Componentes de proteccion dedicados y circuitados para cada modo

"Calidad de energía es nuestro negocio"

P.O. Box 330607
Fort Worth, TX 76163
Phono: 817.483.8497
Fax: 817.572.2242
www.sinetamer.com

La serie LA de SineTamer© reúnen una destacada y sin igual capacidad de supresión de transitorios para protección de la onda senoidal. Dispositivo de gran duración fue previsto para propósitos generales y protección de cargas muy sensibles. Los LA-ST180 (1400 Amp) son típicamente instalados en medianos servicios de acometida, distribución y sub-paneles de distribución. De tamaño compacto y caja no metálica, su diseño también le permite ser instalado directamente en paneles eléctricos y/o en equipos . Su capacidad de instalación interna le permite acortar al máximo los conductores, mejorando su eficiencia y funcionamiento. Los LA-ST180 son extremadamente efectivos en limitar transitorios generados internamente, son absolutamente eficientes en aplicaciones de paneles de alimentación en oficinas y/o equipos basados en microprocesadores.

Este económico y eficiente dispositivo tiene características que no se hayan en dispositivos aun de mayor costo, su tamaño compacto permite una instalación muy fácil. Su operación Libre de Mantenimiento y sus **20 anos de garantía con reemplazo gratuito** contra cualquier anomalía eléctrica da sus usuarios una gran tranquilidad.

DATOS GENERALES

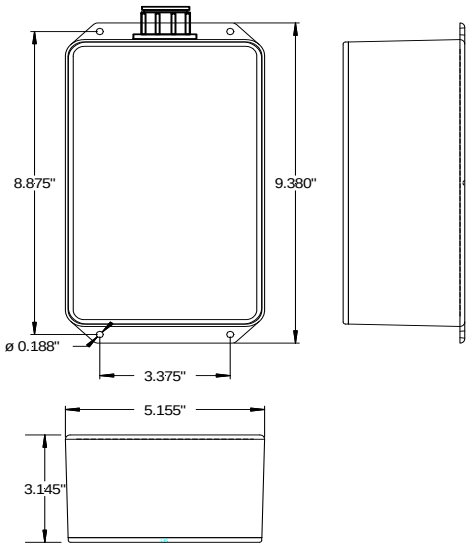
Descripción:	Supresor de transientes de sobrevoltaje de aplicación en paralelo, dispositivo que utiliza ambas tecnologías: manejo de transientes de alta energía y circuito de rastreo de la onda senoidal para virtual eliminación de transientes por impulso y oscilatorios. Diseñado para picos de corriente de 60 ka por modo / 180 ka por fase.
Aplicacion:	Diseñado para uso en las categorías ANSI/IEEE C, B y A con susceptibilidad para niveles de media exposición. Diseñado para proteger cargas sensibles y criticas alimentadas desde paneles de distribución, sub-paneles y/o paneles de equipos individuales.
Garantía:	**20 Anos libre de mantenimiento y con cambio gratuito.**
Calificaciones del producto:	**Listed to UL1449 2nd Edition (Feb. 9, 2007 Rev.) by CSA, an NRTL, CSA MC#214804, UL1283 and CE Compliant, ISO 9001:2000, ANSI C62.72-2007**

CARACTERISTICAS MECANICAS

Caja:	Plástico ABS de alta resistencia
Montaje:	Dispositivo roscado de 1" y pie de montaje externo.
Método de conexión:	Conductores #10.
Peso de despacho:	≈ 2.75 Kilogramos

CARACTERISTICAS ELECTRICAS

Diseño del circuito:	Conectado en paralelo, internamente con fusibles térmicos, diseño híbrido incorporando un verdadero todos los modos de protección (10 modos para unidades trifasicas en estrella) y utilizando nuestro diseño de componentes encapsulados en resina de disipación para proveer una mayor durabilidad. Todos los circuitos de supresión son encapsulados en nuestro exclusivo compuesto para asegurar una larga vida a los componentes y completa protección en ambientes industriales contaminados, húmedos y/o con vibración.
Modos de protección:	Componentes de protección dedicados en cada modo. Verdadero L-N, L-L (Modo Normal), y verdadero L-G, N-G (Modo común). 10 modos en sistema trifásico en estrella.
Frecuencia:	50-60Hz constante (60Hz típico)
EMI/RFI Noise Attenuation:	40dB Max. from 1kHz to 10MHz (normal and common mode)
Circuitos de Diagnostico:	LED's súper brillantes, 1 por fase, normalmente encendidos. Contactos secos para monitoreo remoto standard.
Circuito Interruptor:	Externo e interno (Ver detalle de la instalación).
Fusibles:	Fusibles térmicos y fusibles de corriente para seguridad.



MEDICIONES Y LIMITACION DE VOLTAJE, FUNCIONAMIENTO Y ESPECIFICACIONES ELECTRICAS

Modelo	Configuración	MCOV	Pico de Corriente (Amps) Por Modo	Modos	ANSI/IEEE C62.41 & C62.45 Resultados de pruebas de voltaje remanente		
					A1 2kV, 67A 100KHz Ring Wave 270º Phase Angle	B3/C1 6kV, 3kA Impulse Wave 90º Phase Angle	C3 20kV, 10kA Impulse Wave 90º Phase Angle
LA-ST180-1P1C	120V, Monofásico (2 alambres + tierra)	150 L-N 150 L-G 150 N-G	60,000 L-N 60,000 L-G 60,000 N-G 180,000 Total	L-N L-G N-G	45 60 55	385 400 560	914 1025 1176
LA-ST180-1S1C	120/240V, Bifásico (3 alambres + tierra)	300 L-L 150 L-N 150 L-G 150 N-G	60,000 L-L 60,000 L-N 60,000 L-G 60,000 N-G 360,000 Total	L-L L-N L-G N-G	75 45 60 55	570 385 400 560	1119 914 1025 1176
LA-ST180-3Y1C	120/208V, 3ØY (4 alambres + tierra)	300 L-L 150 L-N 150 L-G 150 N-G	60,000 L-L 60,000 L-N 60,000 L-G 60,000 N-G 600,000 Total	L-L L-N L-G N-G	55 45 60 55	570 385 400 560	1119 914 1025 1176
LA-ST180-1P2C	240V, Monofasico Ø (2 alambres + tierra)	320 L-N 320 L-G 320 N-G	60,000 L-N 60,000 L-G 60,000 N-G 180,000 Total	L-N L-G N-G	60 80 55	560 590 965	1050 1262 1575
LA-ST180-3Y2C	220/380V, 3ØY 277/480V, 3ØY (4 alambres + tierra)	550 L-L 320 L-N 320 L-G 320 N-G	60,000 L-L 60,000 L-N 60,000 L-G 60,000 N-G 600,000 Total	L-L L-N L-G N-G	130 60 80 55	895 560 590 965	1344 1050 1262 1575
LA-ST180-3N2C	240V, 3∅Δ (3 Alambres + tierra)	320 L-L 320 L-G	60,000 L-L 60,000 L-G 360,000 Total	L-L L-G	60 75	590 590	1262 1262
LA-ST180-3N4C	380V, 3∅Δ 480V, 3∅Δ (3 wire + ground)	550 L-L 550 L-G	60,000 L-L 60,000 L-G 360,000 Total	L-L L-G	60 130	895 895	1344 1344
LA-ST180-3N6C	550V, 3∅Δ 660V, 3∅Δ (3 wire + ground)	750 L-L 750 L-G	60,000 L-L 60,000 L-G 360,000 Total	L-L L-G	160 140	1250 1290	1750 1690

Ambiente de prueba de voltaje remanente: Polaridad positiva. Tiempo base =1ms. Todos los voltajes son picos (±10%). Voltajes transitorios son medidos desde el punto de inserción del transitorio en la onda al pico del transitorio. Todas las pruebas son dinámicas (voltaje aplicado) excepto N-G que es estático (no se aplica voltaje). Todas las pruebas son efectuadas con cables a 6 pulgadas de largo fuera de la caja del dispositivo lo cual simula una instalación real.

Los pulsos, las pruebas de picos de corriente para todos los modos son diseñadas, de acuerdo a la NEMA LS 1-1992. pulso simple, capacidad de pico de corriente de 200,000 amps o menos son determinados por unidades simples probando todos los componentes, componentes en cada modo. Actualmente la industria prueba las limitaciones requeridas probando individualmente los componentes o sub-unidades con un modo por simple impulso, capacidad de pico de corriente sobre 200,000 amps.

Debido a que estamos constantemente mejorando nuestros productos, las especificaciones estan sujetas a cambios en cualquier momento. Ultimo cambio de especificaciones 09/08

Supresores de transientes de sobrevoltaje para: **Unidades en panel para AC** ***Modelo LA-ST240***

Componentes de proteccion dedicados y circuitados para cada modo

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La serie LA de SineTamer© reúnen una destacada y sin igual capacidad de supresión de transitorios para protección de la onda senoidal. Dispositivo de gran duración fue previsto para propósitos generales y protección de cargas muy sensibles. Los LA-ST240 (2000 Amp) son típicamente instalados en medianos servicios de acometida, distribución y sub-paneles de distribución. De tamaño compacto y caja no metálica, su diseño también le permite ser instalado directamente en paneles eléctricos y/o en equipos. Su capacidad de instalación interna le permite acortar al máximo los conductores, mejorando su eficiencia y funcionamiento. Los LA-ST240 son extremadamente efectivos en limitar transitorios generados internamente, son absolutamente eficientes en aplicaciones de paneles de alimentación en oficinas y/o equipos basados en microprocesadores.

Este económico y eficiente dispositivo tiene características que no se hayan en dispositivos aun de mayor costo, su tamaño compacto permite una instalación muy fácil. Su operación Libre de Mantenimiento y sus **20 anos de garantía con reemplazo gratuito** contra cualquier anomalía eléctrica da sus usuarios una gran tranquilidad.

DATOS GENERALES

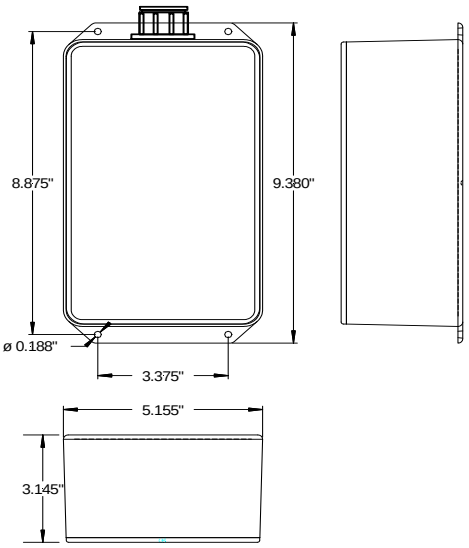
Descripción:	Supresor de transientes de sobrevoltaje de aplicación en paralelo, dispositivo que utiliza ambas tecnologías: manejo de transientes de alta energía y circuito de rastreo de la onda senoidal para virtual eliminación de transientes por impulso y oscilatorios. Diseñado para picos de corriente de 80 ka por modo / 240 ka por fase.
Aplicacion:	Diseñado para uso en las categorías ANSI/IEEE C, B y A con susceptibilidad para niveles de media exposición. Diseñado para proteger cargas sensibles y criticas alimentadas desde paneles de distribución, sub-paneles y/o paneles de equipos individuales.
Garantía:	**20 Anos libre de mantenimiento y con cambio gratuito.**
Calificación del producto:	**Listed to UL1449 2nd Edition (Feb. 9, 2007 Rev.) by CSA, an NRTL, CSA MC#214804, UL1283 and CE Compliant, ISO 9001:2000, ANSI C62.72-2007**

CARACTERISTICAS MECANICAS

Caja:	Plástico ABS de alta resistencia
Montaje:	Dispositivo roscado de 1" y pie de montaje externo.
Método de conexión:	Conductores #10.
Peso de despacho:	≈ 2.75 Kilogramos

CARACTERISTICAS ELECTRICAS

Diseño del circuito:	Conectado en paralelo, internamente con fusibles térmicos, diseño híbrido incorporando un verdadero todos los modos de protección (10 modos para unidades trifasicas en estrella) y utilizando nuestro diseño de componentes encapsulados en resina de disipación para proveer una mayor durabilidad. Todos los circuitos de supresión son encapsulados en nuestro exclusivo compuesto para asegurar una larga vida a los componentes y completa protección en ambientes industriales contaminados, húmedos y/o con vibración.
Modos de protección:	Componentes de protección dedicados en cada modo. Verdadero L-N, L-L (Modo Normal), y verdadero L-G, N-G (Modo común). 10 modos en sistema trifásico en estrella.
Frecuencia:	50-60Hz constante (60Hz típico)
EMI/RFI Noise Attenuation:	40dB Max. from 1kHz to 10MHz (normal and common mode)
Circuitos de Diagnostico:	LED's súper brillantes, 1 por fase, normalmente encendidos. Contactos secos para monitoreo remoto standard.
Circuito Interruptor:	Externo e interno (Ver detalle de la instalación).
Fusibles:	Fusibles térmicos y fusibles de corriente para seguridad



MEDICIONES Y LIMITACION DE VOLTAJE, FUNCIONAMIENTO Y ESPECIFICACIONES ELECTRICAS

Modelo	Configuración	MCOV	Pico de Corriente (Amps) Por Modo	Modos	ANSI/IEEE C62.41 & C62.45 Resultados de pruebas de voltaje remanente		
					A1 2kV, 67A 100KHz Ring Wave 270º Phase Angle	B3/C1 6kV, 3kA Impulse Wave 90º Phase Angle	C3 20kV, 10kA Impulse Wave 90º Phase Angle
LA-ST240-1P1C	120V, Monofásico (2 alambres + tierra)	150 L-N 150 L-G 150 N-G	80,000 L-N 80,000 L-G 80,000 N-G 240,000 Total	L-N L-G N-G	45 60 55	385 400 560	914 1025 1176
LA-ST240-1S1C	120/240V, Bifásico (3 alambres + tierra)	300 L-L 150 L-N 150 L-G 150 N-G	80,000 L-L 80,000 L-N 80,000 L-G 80,000 N-G 480,000 Total	L-L L-N L-G N-G	75 45 60 55	570 385 400 560	1119 914 1025 1176
LA-ST240-3Y1C	120/208V, 3ØY (4 alambres + tierra)	300 L-L 150 L-N 150 L-G 150 N-G	80,000 L-L 80,000 L-N 80,000 L-G 80,000 N-G 800,000 Total	L-L L-N L-G N-G	55 45 60 55	570 385 400 560	1119 914 1025 1176
LA-ST240-1P2C	240V, Monofasico Ø (2 alambres + tierra)	320 L-N 320 L-G 320 N-G	80,000 L-N 80,000 L-G 80,000 N-G 240,000 Total	L-N L-G N-G	60 80 55	560 590 965	1050 1262 1575
LA-ST240-3Y2C	220/380V, 3ØY 277/480V, 3ØY (4 alambres + tierra)	550 L-L 320 L-N 320 L-G 320 N-G	80,000 L-L 80,000 L-N 80,000 L-G 80,000 N-G 800,000 Total	L-L L-N L-G N-G	130 60 80 55	895 560 590 965	1344 1050 1262 1575
LA-ST240-3N2C	240V, 3∅Δ (3 Alambres + tierra)	320 L-L 320 L-G	80,000 L-L 80,000 L-G 480,000 Total	L-L L-G	60 75	590 590	1262 1262
LA-ST240-3N4C	380V, 3∅Δ 480V, 3∅Δ (3 wire + ground)	550 L-L 550 L-G	80,000 L-L 80,000 L-G 480,000 Total	L-L L-G	60 130	895 895	1344 1344

Ambiente de prueba de voltaje remanente: Polaridad positiva. Tempo base = 1ms. Todos los voltajes son picos (±10%). Voltajes transitorios son medidos desde el punto de inserción del transitorio en la onda al pico del transitorio. Todas las pruebas son dinámicas (voltaje aplicado) excepto N-G que es estático (no se aplica voltaje). Todas las pruebas son efectuadas con cables a 6 pulgadas de largo fuera de la caja del dispositivo lo cual simula una instalación real.

Los pulsos, las pruebas de picos de corriente para todos los modos son diseñadas, de acuerdo a la NEMA LS 1-1992. pulso simple, capacidad de pico de corriente de 200,000 amps o menos son determinados por unidades simples probando todos los componentes, componentes en cada modo. Actualmente la industria prueba las limitaciones requeridas probando individualmente los componentes o sub-unidades con un modo por simple impulso, capacidad de pico de corriente sobre 200,000 amps.

Supresores de transientes de sobrevoltaje para: **Unidades en panel para AC** ***Modelo LA-ST300***

Componentes de proteccion dedicados y circuitados para cada modo

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Este económico y eficiente dispositivo tiene características que no se hayan en dispositivos aun de mayor costo, su tamaño compacto permite una instalación muy fácil. Su operación Libre de Mantenimiento y sus **20 anos de garantía con reemplazo gratuito** contra cualquier anomalía eléctrica da sus usuarios una gran tranquilidad.

DATOS GENERALES

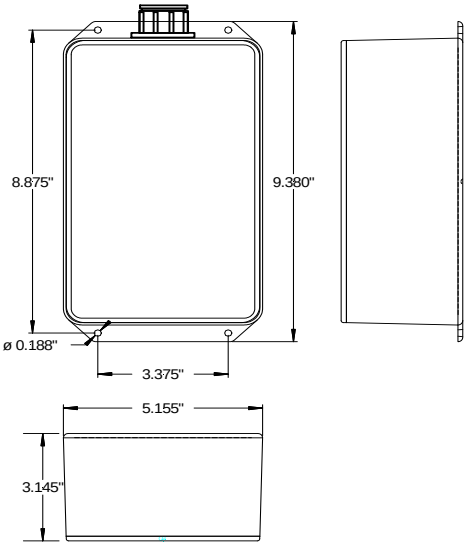
Descripción:	Supresor de transientes de sobrevoltaje de aplicación en paralelo, dispositivo que utiliza ambas tecnologías: manejo de transientes de alta energía y circuito de rastreo de la onda senoidal para virtual eliminación de transientes por impulso y oscilatorios. Diseñado para picos de corriente de 100 ka por modo / 300 ka por fase.
Aplicacion:	Diseñado para uso en las categorías ANSI/IEEE C, B y A con susceptibilidad para niveles de media exposición. Diseñado para proteger cargas sensibles y criticas alimentadas desde paneles de distribución, sub-paneles y/o paneles de equipos individuales.
Garantía:	**20 Anos libre de mantenimiento y con cambio gratuito.**
Calificación del producto:	**Listed to UL1449 2nd Edition (Feb. 9, 2007 Rev.) by CSA, an NRTL, CSA MC#214804, UL1283 and CE Compliant, ISO 9001:2000, ANSI C62.72-2007**

CARACTERISTICAS MECANICAS

Caja:	Plástico ABS de alta resistencia
Montaje:	Dispositivo roscado de 1" y pie de montaje externo.
Método de conexión:	Conductores #10.
Peso de despacho:	≈ 2.75 Kilogramos

CARACTERISTICAS ELECTRICAS

Diseño del circuito:	Conectado en paralelo, internamente con fusibles térmicos, diseño híbrido incorporando un verdadero todos los modos de protección (10 modos para unidades trifasicas en estrella) y utilizando nuestro diseño de componentes encapsulados en resina de disipación para proveer una mayor durabilidad. Todos los circuitos de supresión son encapsulados en nuestro exclusivo compuesto para asegurar una larga vida a los componentes y completa protección en ambientes industriales contaminados, húmedos y/o con vibración.
Modos de protección:	Componentes de protección dedicados en cada modo. Verdadero L-N, L-L (Modo Normal), y verdadero L-G, N-G (Modo común). 10 modos en sistema trifásico en estrella.
Frecuencia:	50-60Hz constante (60Hz típico)
EMI/RFI Noise Attenuation:	40dB Max. from 1kHz to 10MHz (normal and common mode)
Circuitos de Diagnostico:	LED's súper brillantes, 1 por fase, normalmente encendidos. Contactos secos para monitoreo remoto standard.
Circuito Interruptor:	Externo e interno (Ver detalle de la instalación).
Fusibles:	Fusibles térmicos y fusibles de corriente para seguridad



MEDICIONES Y LIMITACION DE VOLTAJE, FUNCIONAMIENTO Y ESPECIFICACIONES ELECTRICAS

Modelo	Configuración	MCOV	Pico de Corriente (Amps) Por Modo	Modos	ANSI/IEEE C62.41 & C62.45 Resultados de pruebas de voltaje remanente		
					A1 2kV, 67A 100KHz Ring Wave 270º Phase Angle	B3/C1 6kV, 3kA Impulse Wave 90º Phase Angle	C3 20kV, 10kA Impulse Wave 90º Phase Angle
LA-ST300-1P1C	120V, Monofásico (2 alambres + tierra)	150 L-N 150 L-G 150 N-G	100,000 L-N 100,000 L-G 100,000 N-G 300,000 Total	L-N L-G N-G	45 60 55	385 400 560	914 1025 1176
LA-ST300-1S1C	120/240V, Bifásico (3 alambres + tierra)	300 L-L 150 L-N 150 L-G 150 N-G	100,000 L-L 100,000 L-N 100,000 L-G 100,000 N-G 600,000 Total	L-L L-N L-G N-G	75 45 60 55	570 385 400 560	1119 914 1025 1176
LA-ST300-3Y1C	120/208V, 3ØY (4 alambres + tierra)	300 L-L 150 L-N 150 L-G 150 N-G	100,000 L-L 100,000 L-N 100,000 L-G 100,000 N-G 1,000,000 Total	L-L L-N L-G N-G	55 45 60 55	570 385 400 560	1119 914 1025 1176
LA-ST300-1P2C	240V, Monofasico Ø (2 alambres + tierra)	320 L-N 320 L-G 320 N-G	100,000 L-N 100,000 L-G 100,000 N-G 300,000 Total	L-N L-G N-G	60 80 55	560 590 965	1050 1262 1575
LA-ST300-3Y2C	220/380V, 3ØY 277/480V, 3ØY (4 alambres + tierra)	550 L-L 320 L-N 320 L-G 320 N-G	100,000 L-L 100,000 L-N 100,000 L-G 100,000 N-G 1,000,000 Total	L-L L-N L-G N-G	130 60 80 55	895 560 590 965	1344 1050 1262 1575
LA-ST300-3N2C	240V, 3∅Δ (3 Alambres + tierra)	320 L-L 320 L-G	100,000 L-L 100,000 L-G 600,000 Total	L-L L-G	60 75	590 590	1262 1262
LA-ST300-3N4C	380V, 3∅Δ 480V, 3∅Δ (3 alambres + tierra)	550 L-L 550 L-G	100,000 L-L 100,000 L-G 600,000 Total	L-L L-G	60 130	895 895	1344 1344

Ambiente de prueba de voltaje remanente: Polaridad positiva. Tempo base = 1ms. Todos los voltajes son picos (±10%). Voltajes transitorios son medidos desde el punto de inserción del transitorio en la onda al pico del transitorio. Todas las pruebas son dinámicas (voltaje aplicado) excepto N-G que es estático (no se aplica voltaje). Todas las pruebas son efectuadas con cables a 6 pulgadas de largo fuera de la caja del dispositivo lo cual simula una instalación real.

Los pulsos, las pruebas de picos de corriente para todos los modos son diseñadas, de acuerdo a la NEMA LS 1-1992. pulso simple, capacidad de pico de corriente de 200,000 amps o menos son determinados por unidades simples probando todos los componentes, componentes en cada modo. Actualmente la industria prueba las limitaciones requeridas probando individualmente los componentes o sub-unidades con un modo por simple impulso, capacidad de pico de corriente sobre 200,000 amps.

Supresores de transientes de sobrevoltaje para: **Unidades en panel para AC** ***Modelo LA-ST60***

Componentes de proteccion dedicados y circuitados para cada modo

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Este económico y eficiente dispositivo tiene características que no se hayan en dispositivos aun de mayor costo, su tamaño compacto permite una instalación muy fácil. Su operación Libre de Mantenimiento y sus **20 anos de garantía con reemplazo gratuito** contra cualquier anomalía eléctrica da sus usuarios una gran tranquilidad.

DATOS GENERALES

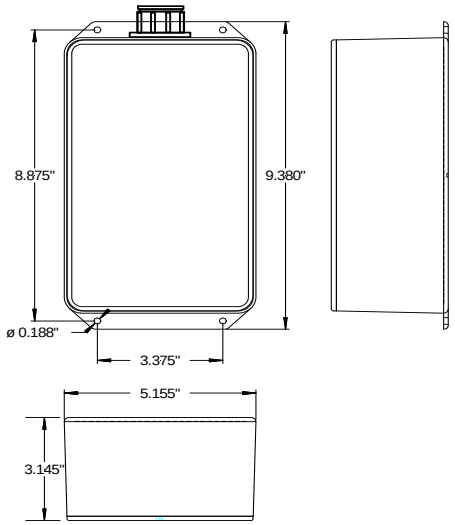
Descripcion:	Supresor de transientes de sobrevoltaje de aplicación en paralelo, dispositivo que utiliza ambas tecnologías: manejo de transientes de alta energía y circuito de rastreo de la onda senoidal para virtual eliminación de transientes por impulso y oscilatorios. Diseñado para picos de corriente de 20 ka por modo / 60 ka por fase.
Aplicacion:	Diseñado para uso en las categorías ANSI/IEEE C, B y A con susceptibilidad para niveles de media exposición. Diseñado para proteger cargas sensibles y criticas alimentadas desde paneles de distribución, sub-paneles y/o paneles de equipos individuales.
Garantia:	**20 Anos libre de mantenimiento y con cambio gratuito.**
Product Qualifications:	**Listed to UL1449 2nd Edition (Feb. 9, 2007 Rev.) by CSA, an NRTL, CSA MC#214804, UL1283 and CE Compliant, ISO 9001:2000, ANSI C62.72-2007**

CARACTERISTICAS MECANICAS

Caja:	Plástico ABS de alta resistencia
Montaje:	Dispositivo roscado de 1" y pie de montaje externo.
Método de conexión:	Conductores #10.
Peso de despacho:	≈ 2.75 Kilogramos

CARACTERISTICAS ELECTRICAS

Diseño del circuito:	Conectado en paralelo, internamente con fusibles térmicos, diseño híbrido incorporando un verdadero todos los modos de protección (10 modos para unidades trifasicas en estrella) y utilizando nuestro diseño de componentes encapsulados en resina de disipación para proveer una mayor durabilidad. Todos los circuitos de supresión son encapsulados en nuestro exclusivo compuesto para asegurar una larga vida a los componentes y completa protección en ambientes industriales contaminados, húmedos y/o con vibración.
Modos de protección:	Componentes de protección dedicados en cada modo. Verdadero L-N, L-L (Modo Normal), y verdadero L-G, N-G (Modo común). 10 modos en sistema trifásico en estrella.
Frecuencia:	50-60Hz constante (60Hz típico)
EMI/RFI Noise Attenuation:	40dB Max. from 1kHz to 10MHz (normal and common mode)
Circuitos de Diagnostico:	LED's super brillantes, 1 por fase, normalmente encendidos. Contactos secos para monitoreo remoto standard.
Circuito Interruptor:	Externo e interno (Ver detalle de la instalación).
Fusibles:	Fusibles térmicos y fusibles de corriente para seguridad



MEDICIONES Y LIMITACION DE VOLTAJE, FUNCIONAMIENTO Y ESPECIFICACIONES ELECTRICAS

Modelo	Configuración	MCOV	Pico de Corriente (Amps) Por Modo	Modos	ANSI/IEEE C62.41 & C62.45 Resultados de pruebas de voltaje remanente		
					A1 2kV, 67A 100KHz Ring Wave 270º Phase Angle	B3/C1 6kV, 3kA Impulse Wave 90º Phase Angle	C3 20kV, 10kA Impulse Wave 90º Phase Angle
LA-ST60-1P1C	120V, Monofasico (2 alambres + tierra)	150 L-N 150 L-G 150 N-G	20,000 L-N 20,000 L-G 20,000 N-G 60,000 Total	L-N L-G N-G	45 60 55	385 400 560	914 1025 1176
LA-ST60-1S1C	120/240V, Bifasico (3 alambres + tierra)	300 L-L 150 L-N 150 L-G 150 N-G	20,000 L-L 20,000 L-N 20,000 L-G 20,000 N-G 120,000 Total	L-L L-N L-G N-G	75 45 60 55	570 385 400 560	1119 914 1025 1176
LA-ST60-3Y1C	120/208V, 3ØY (4 alambres + tierra)	300 L-L 150 L-N 150 L-G 150 N-G	20,000 L-L 20,000 L-N 20,000 L-G 20,000 N-G 200,000 Total	L-L L-N L-G N-G	55 45 60 55	570 385 400 560	1119 914 1025 1176
LA-ST60-1P2C	240V, Monofasico Ø (2 alambres + tierra)	320 L-N 320 L-G 320 N-G	20,000 L-N 20,000 L-G 20,000 N-G 60,000 Total	L-N L-G N-G	60 80 55	560 590 965	1050 1262 1575
LA-ST60-3Y2C	220/380V, 3ØY 277/480V, 3ØY (4 alambres + tierra)	550 L-L 320 L-N 320 L-G 320 N-G	20,000 L-L 20,000 L-N 20,000 L-G 20,000 N-G 200,000 Total	L-L L-N L-G N-G	130 60 80 55	895 560 590 965	1344 1050 1262 1575
LA-ST60-3N2C	240V, 3∅Δ (3 Alambres + tierra)	320 L-L 320 L-G	20,000 L-L 20,000 L-G 120,000 Total	L-L L-G	60 75	590 590	1262 1262
LA-ST60-3N4C	380V, 3∅Δ 480V, 3∅Δ (3 alambres + tierra)	550 L-L 550 L-G	20,000 L-L 20,000 L-G 120,000 Total	L-L L-G	60 130	895 895	1344 1344
LA-ST60-3N6C	550V, 3∅Δ 660V, 3∅Δ (3 alambres + tierra)	750 L-L 750 L-G	20,000 L-L 20,000 L-G 120,000 Total	L-L L-G	160 140	1250 1290	1750 1690

. **Ambiente de prueba de voltaje remanente**: Polaridad positiva. Tempo base=1ms. Todos los voltajes son picos (±10%). Voltajes transitorios son medidos desde el punto de inserción del transitorio en la onda al pico del transitorio. Todas las pruebas son dinámicas (voltaje aplicado) excepto N-G que es estático (no se aplica voltaje). Todas las pruebas son efectuadas con cables a 6 pulgadas de largo fuera de la caja del dispositivo lo cual simula una instalación real.

Los pulsos, las pruebas de picos de corriente para todos los modos son diseñadas, de acuerdo a la NEMA LS 1-1992. pulso simple, capacidad de pico de corriente de 200,000 amps o menos son determinados por unidades simples probando todos los componentes, componentes en cada modo. Actualmente la industria prueba las limitaciones requeridas probando individualmente los componentes o sub-unidades con un modo por simple impulso, capacidad de de pico de corriente sobre 200,000 amps.

Debido a que estamos constantemente mejorando nuestros productos, las especificaciones estan sujetas a cambios en cualquier momento. Ultimo cambio de especificaciones 03/08

Supresores de transientes de sobrevoltaje por:

Unidades en panel para AC

Modelo RM-ST120

"Calidad de energia es nuestro negocio"

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Fax: 817.572.2242
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La serie RM de SineTamer© reúne una destacada y sin igual capacidad de supresión de transitorios para protección de la onda senoidal. Dispositivo de gran duración, fue previsto para propósitos generales y protección de cargas muy sensibles. Los RM-ST120 (800 Amp) son típicamente instalados en pequeños servicios de acometida, distribución y sub-paneles de distribución. De tamaño compacto y caja no metálica, su diseño también le permite ser instalado directamente en paneles eléctricos y/o en equipos . Su capacidad de instalación interna le permite acortar al máximo los conductores, mejorando su eficiencia y funcionamiento. Los RM-ST120 son extremadamente efectivos en limitar transitorios generados internamente, son absolutamente eficientes en aplicaciones de paneles de alimentación en oficinas y/o equipos basados en microprocesadores.

Este económico y eficiente dispositivo tiene características que no se hayan en dispositivos aun de mayor costo, su tamaño compacto permite una instalación muy fácil. Su operación Libre de Mantenimiento y sus **15 anos de garantía con reemplazo gratuito** contra cualquier anomalía eléctrica da sus usuarios una gran tranquilidad.

GENERAL

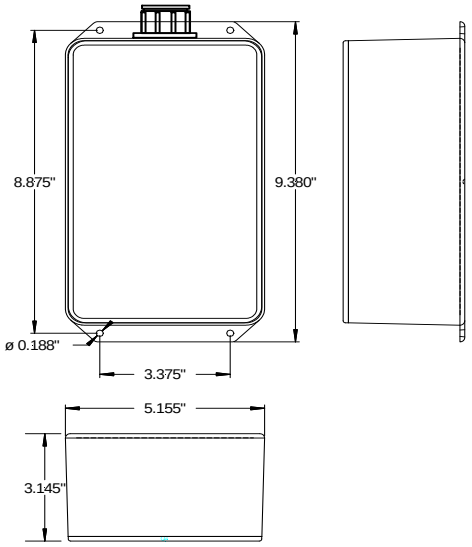
Descripción:	Supresor de transientes de sobrevoltaje de aplicación en paralelo, dispositivo que utiliza ambas tecnologías: manejo de transientes de alta energía y circuito de rastreo de la onda senoidal para virtual eliminación de transientes por impulso y oscilatorios. Diseñado para picos de corriente de 80 ka por fase.
Aplicación:	Diseñado para uso en las categorías ANSI/IEEE C, B y A con susceptibilidad para niveles de media exposición. Diseñado para proteger cargas sensibles y criticas alimentadas desde paneles de distribución, sub-paneles y/o paneles de equipos individuales.
Garantía:	**15 Anos libre de mantenimiento y con cambio gratuito**
Qualificaciónes:	**Listed to UL1449 2nd Edition (Feb. 9, 2007 Rev.) by CSA, an NRTL, CSA MC#214804, UL1283 and CE Compliant, ISO 9001:2000, ANSI C62.72-2007**

CARACT. MECANICAS

Caja:	Plástico ABS de alta resistencia
Montaje:	Dispositivo roscado de 3/4" y pie de montaje externo
Método de colección:	Alambre #10
Peso embalado:	≈5 lbs o 2,2 kgs.

ELECTRICAS

Diseño :	Conectado en paralelo, con fusibles internos, de diseño hibrido incorporando protección en todos los modos, utilizando nuestro sistema de encapsulamiento para alargar la vida de los componentes y mejorar la durabilidad. Todos los componentes de supresion están embebidos en este exclusivo compuesto para asegurar larga vida a los mismos y darles protección contra el medio ambiente y vibración.
Modos de proteccion:	L-N, L-L (Modo Normal), y L-G, N-G (Modo común)
Frecuencia:	50-60Hz constante (60Hz típico)
Tiempo de Respuesta:	<1 nanosegundo
Atenuación de ruidos EMI/RFI:	30dB Max. de 1kHz a 10MHz
Capacitancia:	Hasta 3.5 uF Max.
Diagnostico de circuito:	LED's súper brillantes, 1 por fase, normalmente encendidos.
Interruptores:	Externo e interno (Ver detalle de la instalacion).
Fusibles:	Fusibles térmicos y fusibles de corriente para seguridad



MEDICIONES Y LIMITACION DE VOLTAJE, FUNCIONAMIENTO Y ESPECIFICACIONES ELECTRICAS

Modelo	Configuración	Máxima tensión de operación continua	Pico de Corriente (Amps) Por Modo/Por Fase	Modo	ANSI/IEEE C62.41 & C62.45 Resultados de pruebas de voltaje remanente		
					A1 2kV, 67A 100KHz Ring Wave 270º Phase Angle	B3/C1 6kV, 3kA Impulse Wave 90º Phase Angle	C3 20kV, 10kA Impulse Wave 90º Phase Angle
RM-ST120-1P1	120V, monofasico (2 wires + ground)	150 L-N 150 L-G 150 N-G	40,000 / 80,000	L-N L-G N-G	70 85 60	385 400 565	925 1200 1200
RM –ST120-1S1	120/240V, Bifasico (3 wire + ground)	300 L-L 150 L-N 150 L-G 150 N-G	40,000 / 80,000	L-L L-N L-G N-G	80 75 85 65	600 410 420 565	1200 914 1200 1200
RM-ST120-3Y1	120/208V, 3ØY (4 wire + ground)	300 L-L 150 L-N 150 L-G 150 N-G	40,000 / 80,000	L-L L-N L-G N-G	80 75 85 65	600 410 420 565	1200 914 1200 1200
RM –ST120-1P2	240V, Monofasico (2 wire + ground)	320 L-N 320 L-G 320 N-G	40,000 / 80,000	L-N L-G N-G	96 100 100	560 590 590	1050 1290 1290
RM –ST120-3Y2	277/480V, 3ØY 220/380V, 3ØY (4 wire + ground)	550 L-L 320 L-N 320 L-G 320 N-G	40,000 / 80,000	L-L L-N L-G N-G	135 96 100 100	895 575 575 985	1400 1050 1400 1575
RM –ST120-3N2	240V, 3∅Δ (3 wire + ground)	320 L-L 320 L-G	40,000 / 80,000	L-L L-G	96 100	643 643	1275 1275
RM –ST120-3N4	380V, 3∅Δ 480V, 3∅Δ (3 wire + ground)	550 L-L 550 L-G	40,000 / 80,000	L-L L-G	140 140	915 915	1375 1375

. **Ambiente de prueba de voltaje remanente**: Polaridad positiva. Tempo base = 1ms. Todos los voltajes son picos (±10%). Voltajes transitorios son medidos desde el punto de inserción del transitorio en la onda al pico del transitorio. Todas las pruebas son dinámicas (voltaje aplicado) excepto N-G que es estático (no se aplica voltaje). Todas las pruebas son efectuadas con cables a 6 pulgadas de largo fuera de la caja del dispositivo lo cual simula una instalación real.

Los pulsos, las pruebas de picos de corriente para todos los modos son diseñadas, de acuerdo a la NEMA LS 1-1992. pulso simple, capacidad de pico de corriente de 200,000 amps o menos son determinados por unidades simples probando todos los componentes, componentes en cada modo. Actualmente la industria prueba las limitaciones requeridas probando individualmente los componentes o sub-unidades con un modo por simple impulso, capacidad de de pico de corriente sobre 200,000 amps.

Because we are constantly seeking to improve our products, specifications are subject to change at any time.

Supresores de transientes de sobrevoltaje por:

Unidades en panel para AC

Modelo RM-ST180

"Calidad de energia es nuestro negocio"

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La serie RM de SineTamer© reúne una destacada y sin igual capacidad de supresión de transitorios para protección de la onda senoidal. Dispositivo de gran duración, fue previsto para propósitos generales y protección de cargas muy sensibles. Los RM-ST180 (1200 Amp) son típicamente instalados en pequeños servicios de acometida, distribución y sub-paneles de distribución. De tamaño compacto y caja no metálica, su diseño también le permite ser instalado directamente en paneles eléctricos y/o en equipos . Su capacidad de instalación interna le permite acortar al máximo los conductores, mejorando su eficiencia y funcionamiento. Los RM-ST180 son extremadamente efectivos en limitar transitorios generados internamente, son absolutamente eficientes en aplicaciones de paneles de alimentación en oficinas y/o equipos basados en microprocesadores.

Este económico y eficiente dispositivo tiene características que no se hayan en dispositivos aun de mayor costo, su tamaño compacto permite una instalación muy fácil. Su operación Libre de Mantenimiento y sus **15 anos de garantía con reemplazo gratuito** contra cualquier anomalía eléctrica da sus usuarios una gran tranquilidad.

GENERAL

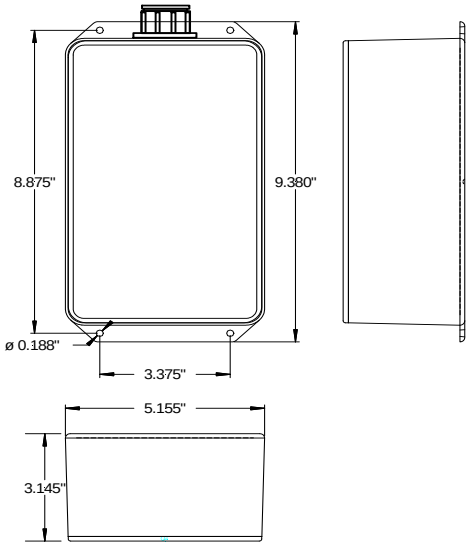
Descripción:	Supresor de transientes de sobrevoltaje de aplicación en paralelo, dispositivo que utiliza ambas tecnologías: manejo de transientes de alta energía y circuito de rastreo de la onda senoidal para virtual eliminación de transientes por impulso y oscilatorios. Diseñado para picos de corriente de 120 ka por fase.
Aplicación:	Diseñado para uso en las categorías ANSI/IEEE C, B y A con susceptibilidad para niveles de media exposición. Diseñado para proteger cargas sensibles y criticas alimentadas desde paneles de distribución, sub-paneles y/o paneles de equipos individuales.
Garantía:	**15 Anos libre de mantenimiento y con cambio gratuito**
Qualificaciónes:	**Listed to UL1449 2nd Edition (Feb. 9, 2007 Rev.) by CSA, an NRTL, CSA MC#214804, UL1283 and CE Compliant, ISO 9001:2000, ANSI C62.72-2007**

CARACT. MECANICAS

Caja:	Plástico ABS de alta resistencia
Montaje:	Dispositivo roscado de 3/4" y pie de montaje externo
Método de colección:	Alambre #10
Peso embalado:	≈5 lbs o 2,2 kgs.

ELECTRICAS

Diseño :	Conectado en paralelo, con fusibles internos, de diseño hibrido incorporando protección en todos los modos, utilizando nuestro sistema de encapsulamiento para alargar la vida de los componentes y mejorar la durabilidad. Todos los componentes de supresion están embebidos en este exclusivo compuesto para asegurar larga vida a los mismos y darles protección contra el medio ambiente y vibración.
Modos de proteccion:	L-N, L-L (Modo Normal), y L-G, N-G (Modo común)
Frecuencia:	50-60Hz constante (60Hz típico)
Tiempo de Respuesta:	<1 nanosegundo
Atenuación de ruidos EMI/RFI:	30dB Max. de 1kHz a 10MHz
Capacitancia:	Hasta 3.5 uF Max.
Diagnostico de circuito:	LED's súper brillantes, 1 por fase, normalmente encendidos.
Interruptores:	Externo e interno (Ver detalle de la instalacion).
Fusibles:	Fusibles térmicos y fusibles de corriente para seguridad



MEDICIONES Y LIMITACION DE VOLTAJE, FUNCIONAMIENTO Y ESPECIFICACIONES ELECTRICAS

Modelo	Configuración	Máxima tensión de operación continua	Pico de Corriente (Amps) Por Modo/Por Fase	Modo	ANSI/IEEE C62.41 & C62.45 Resultados de pruebas de voltaje remanente		
					A1 2kV, 67A 100KHz Ring Wave 270º Phase Angle	B3/C1 6kV, 3kA Impulse Wave 90º Phase Angle	C3 20kV, 10kA Impulse Wave 90º Phase Angle
RM-ST180-1P1	120V, monofasico (2 wires + ground)	150 L-N 150 L-G 150 N-G	60,000 / 120,000	L-N L-G N-G	70 85 60	385 400 565	925 1200 1200
RM –ST180-1S1	120/240V, Bifasico (3 wire + ground)	300 L-L 150 L-N 150 L-G 150 N-G	60,000 / 120,000	L-L L-N L-G N-G	80 75 85 65	600 410 420 565	1200 914 1200 1200
RM-ST180-3Y1	120/208V, 3ØY (4 wire + ground)	300 L-L 150 L-N 150 L-G 150 N-G	60,000 / 120,000	L-L L-N L-G N-G	80 75 85 65	600 410 420 565	1200 914 1200 1200
RM –ST180-1P2	240V, Monofasico (2 wire + ground)	320 L-N 320 L-G 320 N-G	60,000 / 120,000	L-N L-G N-G	96 100 100	560 590 590	1050 1290 1290
RM –ST180-3Y2	277/480V, 3ØY 220/380V, 3ØY (4 wire + ground)	550 L-L 320 L-N 320 L-G 320 N-G	60,000 / 120,000	L-L L-N L-G N-G	135 96 100 100	895 575 575 985	1400 1050 1400 1575
RM –ST180-3N2	240V, 3∅Δ (3 wire + ground)	320 L-L 320 L-G	60,000 / 120,000	L-L L-G	96 100	643 643	1275 1275
RM –ST180-3N4	380V, 3∅Δ 480V, 3∅Δ (3 wire + ground)	550 L-L 550 L-G	60,000 / 120,000	L-L L-G	140 140	915 915	1375 1375

. **Ambiente de prueba de voltaje remanente**: Polaridad positiva. Tempo base = 1ms. Todos los voltajes son picos (±10%). Voltajes transitorios son medidos desde el punto de inserción del transitorio en la onda al pico del transitorio. Todas las pruebas son dinámicas (voltaje aplicado) excepto N-G que es estático (no se aplica voltaje). Todas las pruebas son efectuadas con cables a 6 pulgadas de largo fuera de la caja del dispositivo lo cual simula una instalación real.

Los pulsos, las pruebas de picos de corriente para todos los modos son diseñadas, de acuerdo a la NEMA LS 1-1992. pulso simple, capacidad de pico de corriente de 200,000 amps o menos son determinados por unidades simples probando todos los componentes, componentes en cada modo. Actualmente la industria prueba las limitaciones requeridas probando individualmente los componentes o sub-unidades con un modo por simple impulso, capacidad de de pico de corriente sobre 200,000 amps.

Because we are constantly seeking to improve our products, specifications are subject to change at any time.

Supresores de transientes de sobrevoltaje por:

Unidades en panel para AC

Modelo RM-ST60

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Este económico y eficiente dispositivo tiene características que no se hayan en dispositivos aun de mayor costo, su tamaño compacto permite una instalación muy fácil. Su operación Libre de Mantenimiento y sus **15 anos de garantía con reemplazo gratuito** contra cualquier anomalía eléctrica da sus usuarios una gran tranquilidad.

GENERAL

Descripcion:	Supresor de transientes de sobrevoltaje de aplicación en paralelo, dispositivo que utiliza ambas tecnologías: manejo de transientes de alta energía y circuito de rastreo de la onda senoidal para virtual eliminación de transientes por impulso y oscilatorios. Diseñado para picos de corriente de 40 ka por fase.
Aplicacion:	Diseñado para uso en las categorías ANSI/IEEE C, B y A con susceptibilidad para niveles de media exposición. Diseñado para proteger cargas sensibles y criticas alimentadas desde paneles de distribución, sub-paneles y/o paneles de equipos individuales.
Garantia:	**15 Anos libre de mantenimiento y con cambio gratuito**
Qualificaciónes:	**Listed to UL1449 2nd Edition (Feb. 9, 2007 Rev.) by CSA, an NRTL, CSA MC#214804, UL1283 and CE Compliant, ISO 9001:2000, ANSI C62.72-2007**

CARACT. MECANICAS

Caja:	Plástico ABS de alta resistencia
Montaje:	Dispositivo roscado de 3/4" y pie de montaje externo
Método de colección:	Alambre #10
Peso embalado:	≈2.75 kgs.

ELECTRICAS

Diseño :	Conectado en paralelo, con fusibles internos, de diseño hibrido incorporando protección en todos los modos, utilizando nuestro sistema de encapsulamiento para alargar la vida de los componentes y mejorar la durabilidad. Todos los componentes de supresion están embebidos en este exclusivo compuesto para asegurar larga vida a los mismos y darles protección contra el medio ambiente y vibración.
Modos de proteccion:	L-N, L-L (Modo Normal), y L-G, N-G (Modo común)
Frecuencia:	50-60Hz constante (60Hz típico)
Tiempo de Respuesta:	<1 nanosegundo
Atenuación de ruidos EMI/RFI:	30dB Max. de 1kHz a 10MHz
Capacitancia:	Hasta 3.5 uF Max.
Diagnostico de circuito:	LED's súper brillantes, 1 por fase, normalmente encendidos.
Interruptores:	Externo e interno (Ver detalle de la instalación).
Fusibles:	Fusibles térmicos y fusibles de corriente para seguridad

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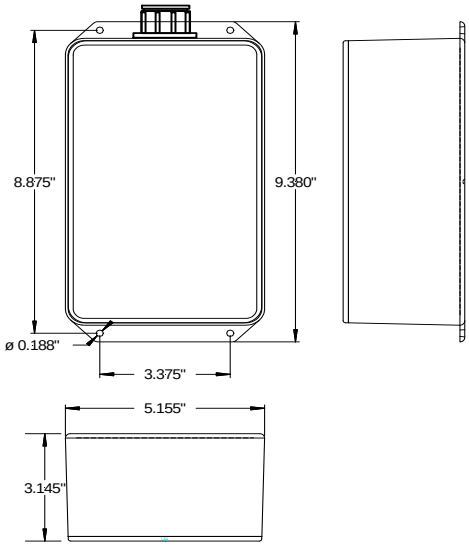

MEDICIONES Y LIMITACION DE VOLTAJE, FUNCIONAMIENTO Y ESPECIFICACIONES ELECTRICAS

Modelo	Configuración	Máxima tensión de operación continua	Pico de Corriente (Amps) Por Modo/Por Fase	Modo	ANSI/IEEE C62.41 & C62.45 Resultados de pruebas de voltaje remanente		
					A1 2kV, 67A 100KHz Ring Wave 270º Phase Angle	B3/C1 6kV, 3kA Impulse Wave 90º Phase Angle	C3 20kV, 10kA Impulse Wave 90º Phase Angle
RM-ST60-1P1	120V, monofasico (2 wires + ground)	150 L-N 150 L-G 150 N-G	20,000 / 40,000	L-N L-G N-G	70 85 60	385 400 565	925 1200 1200
RM -ST60-1S1	120/240V, Bifasico (3 wire + ground)	300 L-L 150 L-N 150 L-G 150 N-G	20,000 / 40,000	L-L L-N L-G N-G	80 75 85 65	600 410 420 565	1200 914 1200 1200
RM-ST60-3Y1	120/208V, 3ØY (4 wire + ground)	300 L-L 150 L-N 150 L-G 150 N-G	20,000 / 40,000	L-L L-N L-G N-G	80 75 85 65	600 410 420 565	1200 914 1200 1200
RM -ST60-1P2	240V, Monofasico (2 wire + ground)	320 L-N 320 L-G 320 N-G	20,000 / 40,000	L-N L-G N-G	96 100 100	560 590 590	1050 1290 1290
RM -ST60-3Y2	277/480V, 3ØY 220/380V, 3ØY (4 wire + ground)	550 L-L 320 L-N 320 L-G 320 N-G	20,000 / 40,000	L-L L-N L-G N-G	135 96 100 100	895 575 575 985	1400 1050 1400 1575
RM -ST60-3N2	240V, 3∅Δ (3 wire + ground)	320 L-L 320 L-G	20,000 / 40,000	L-L L-G	96 100	643 643	1275 1275
RM -ST60-3N4	380V, 3∅Δ 480V, 3∅Δ (3 wire + ground)	550 L-L 550 L-G	20,000 / 40,000	L-L L-G	140 140	915 915	1375 1375
RM -ST60-3N6	6000V, 3∅Δ (3 wire + ground)	750 L-L 750 L-G	20,000 / 40,000	L-L L-G	160 140	1250 1290	1690 1690

. **Ambiente de prueba de voltaje remanente**: Polaridad positiva. Tempo base = 1ms. Todos los voltajes son picos (±10%). Voltajes transitorios son medidos desde el punto de inserción del transitorio en la onda al pico del transitorio. Todas las pruebas son dinámicas (voltaje aplicado) excepto N-G que es estático (no se aplica voltaje). Todas las pruebas son efectuadas con cables a 6 pulgadas de largo fuera de la caja del dispositivo lo cual simula una instalación real.

Los pulsos, las pruebas de picos de corriente para todos los modos son diseñadas, de acuerdo a la NEMA LS 1-1992. pulso simple, capacidad de pico de corriente de 200,000 amps o menos son determinados por unidades simples probando todos los componentes, componentes en cada modo. Actualmente la industria prueba las limitaciones requeridas probando individualmente los componentes o sub-unidades con un modo por simple impulso, capacidad de de pico de corriente sobre 200,000 amps.

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