

Model: ST-CSEx

240 kA Per Phase*
with Frequency Attenuation
ANSI/UL 1449 Fourth Edition



* 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 Wye circuits) as recommended by IEEE Std. 1100-2005
- Industry Leading Measured Limiting Voltage (let-through) Performance
- Multi-stage Hybrid Optimal Frequency Attenuation[®] Circuit
- Local & Remote Diagnostics
- Independent Verification of Performance and Safety
- No moving parts or springs - No mechanical or electro-mechanical thermal/over-current protection
- Rated as Type 2 SPD
- Component-Level, Thermal Fusing
- Patented Internal, Circuit Board Mounted, Over-Current Fusing
- 25 Year Unlimited Free Replacement Warranty



Application: The ST-CSEx series is the workhorse of our product line. This durable, high performance single port device is intended for sensitive and critical load applications at service entrance locations, main distribution panels, motor control centers, and individual equipment.

ANSI/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 **Optimal Frequency Attenuation Circuitry[®]** and **Optimal Response Circuitry[™]** circuit design incorporating component-level, thermal fusing and **Patented** 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 systems, (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 1 Rated Standard Enclosure
(Other enclosure options available see pg. 2)

SPD Type: Type 2 SPD (CSEB, CSEA)

Nominal Discharge Current (I_n) Rating: 20 kA (CSEB) 10kA (CSEA)

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 patented circuit board mounted, over-current fusing. No external over-current protection required.

Short Circuit Current Rating: 200 kAIC

Product Qualifications:
ANSI/UL 1449 Fourth Edition by CSA (MC# 259700) & UL – (ML#: E363345); UL1283* and CE Compliant (*Type 2 SPDs only) ISO 9001:2000, ANSI C62.72-2007, IEC 61643-1 Class 2&3

Voltage Code	ANSI/UL 1449-2006 (Third Edition) Voltage Protection Rating (VPR)						
	L-N	HL-N	L-G	HL-G	N-G	L-L	HL-L
1S1	500	-	500	-	500	1000	-
3Y1	500	-	500	-	500	1000	-
3D1	500	1000	500	1000	500	1000	1000
3Y2	1000	-	1000	-	1200	1800	-
3N2	-	-	1000	-	-	1000	-
3N4	-	-	1800	-	-	1800	-



ST-CSEx

Voltage Code	Circuit Type	Peak Surge Current	MCOV	ANSI/IEEE C62.41.1 & .2-2002 and C62.45-2002 Let-through Voltage Test Results (tested w/6" lead length external to the enclosure per UL 1449)		
				Test Mode	Cat A, 30 Ω 100 kHz Ring Wave 2 kV / 67 A @ 270° Phase Angle	Cat C, 2 Ω Combination Wave 20 kV / 10 kA @ 90° Phase Angle
1S1	120/240 V 1Ø (Split) (3 wire + ground)	80 kA L-N	150 V	L-N	34 V	914 V
		80 kA L-L	300 V	L-L	38 V	1,119 V
		80 kA L-G	150 V	L-G	56 V	1,025 V
		80 kA N-G	150 V	N-G	58 V	1,176 V
		480 kA Total				
3Y1	120/208 V 3Ø Wye (4 wire + ground)	80 kA L-N	150 V	L-N	34 V	914 V
		80 kA L-L	300 V	L-L	38 V	1,119 V
		80 kA L-G	150 V	L-G	56 V	1,025 V
		80 kA N-G	150 V	N-G	58 V	1,176 V
		800 kA Total				
3D1	120/240 V 3Ø High-Leg Delta (4 wire + ground)	80 kA L-N	150 V	L-N	34 V	914 V
		80 kA HL-N	320 V	HL-N	34 V	1,050 V
		80 kA L-L	300 V	L-L	38 V	1,119 V
		80 kA L-G	150 V	L-G	56 V	1,025 V
		80 kA HL-G	320 V	HL-G	56 V	1,262 V
		80 kA N-G	150 V	N-G	58 V	1,176 V
		800 kA Total				
3Y2	277/480 V 3Ø Wye (4 wire + ground)	80 kA L-N	320 V	L-N	50 V	1,050 V
		80 kA L-L	550 V	L-L	111 V	1,344 V
		80 kA L-G	320 V	L-G	74 V	1,262 V
		80 kA N-G	320 V	N-G	54 V	1,575 V
		800 kA Total				
3N2	240 V 3Ø Delta (NN) (3 wire + ground)	80 kA L-L	320 V	L-L	50 V	1,262 V
		80 kA L-G	320 V	L-G		1,262 V
		480 kA Total				
3N4	480 V 3Ø Delta (NN) (3 wire + ground)	80 kA L-L	550 V	L-L	50 V	1,344 V
		80 kA L-G	550 V	L-G		1,344 V
		480 kA Total				

Let-through Voltage Test Parameters: Positive Polarity, Net 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. Each phase is the average of the 3 modes. In order to duplicate the results, the specified mode must be tested for all three phases (except N-G) and averaged together. (Individual mode or shot results may vary by more than 10%. Scope Settings: Time Base = 10 microseconds, Sampling Rate = 500 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.**

Model Number Example: ST-CSEA3Y2D3

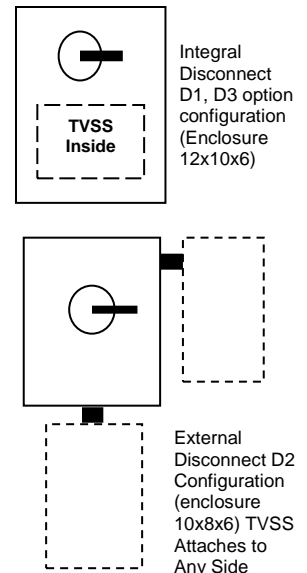
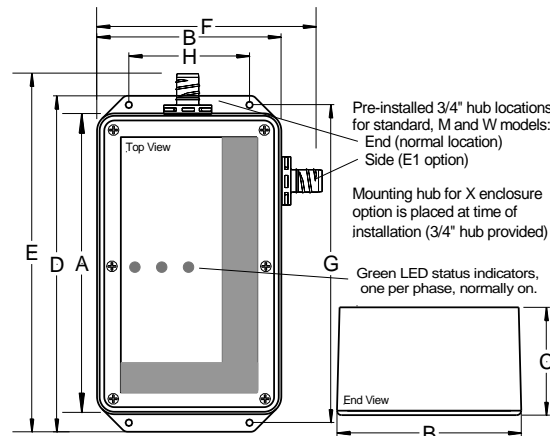
Base Model: ST-CSE	SPD type: A, B	Voltage Code: See Above	Options: See Below
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- AC** = Internal Audible Alarm w/ test button, mute switch and red LED
- C** = Form C dry relay contacts
- D1** = Integral, non-fused disconnect switch (TVSS unit mounts 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
- K** = Gasket Kit (for units requiring NEMA 4X enclosure rating)
- 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
- 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**) Other options may be available upon request.

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)	13.23 (337)
F	6.23 (159)	9.00 (229)	9.00 (229)	11.73 (299)
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 1 ABS	NEMA 12 Steel	NEMA 4 Steel	NEMA 4X Composite
lbs (kg)	5 (2.27)	14 (6.36)	14 (6.36)	10 (4.54)



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

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

Rev Date: 08/09/15

Flush mount trim plate available for standard and "M" option models.

	PO Box 330607 Ft. Worth, TX 76163 817.483.8497
info@sinetamer.com - www.sinetamer.com	