

Model: ST-LSEx

240 kA Per Phase*
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 NEMA LS-1 and IEEE Std. 1100-2005
- Industry Leading Measured Limiting Voltage (let-through) Performance
- UL 1283 EMI/RFI Parallel Configured Optimal Response Circuitry™
- 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 1 or Type 2 SPD
- Component-Level, Thermal Fusing
- Patented Internal, Circuit Board Mounted, Over-Current Fusing
- 25 Year Unlimited Free Replacement Warranty



Application: The ST-LSEx series is one of the most versatile units in our product line. This 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.

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 **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 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

Standard Enclosure: NEMA 1 Rated Standard Enclosure
(Other enclosure options available see pg. 2)

SPD Type: Type 1 SPD (LSEC, LSED)
Type 2 SPD (LSEB, LSEA)

Nominal Discharge Current (I_n) Rating: 20 kA (LSEB, LSED) 10 kA (LSEC, LSEA)

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	-



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 6 kV 200 A @ 90° 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 80 kA L-L 80 kA L-G 80 kA N-G 480 kA Total	150 V 300 V 150 V 150 V	L-N L-L L-G N-G	289 V 436 V 296 V 570 V	914 V 1,119 V 1,025 V 1,176 V
3Y1	120/208 V 3Ø Wye (4 wire + ground)	80 kA L-N 80 kA L-L 80 kA L-G 80 kA N-G 800 kA Total	150 V 300 V 150 V 150 V	L-N L-L L-G N-G	289 V 436 V 296 V 570 V	914 V 1,119 V 1,025 V 1,176 V
3D1	120/240 V 3Ø High-Leg Delta (4 wire + ground)	80 kA L-N 80 kA HL-N 80 kA L-L 80 kA L-G 80 kA HL-G 80 kA N-G 800 kA Total	150 V 320 V 300 V 150 V 320 V 150 V	L-N HL-N L-L L-G HL-G N-G	289 V 410 V 436 V 296 V 420 V 570 V	914 V 1,050 V 1,119 V 1,025 V 1,262 V 1,176 V
3Y2	277/480 V 3Ø Wye (4 wire + ground)	80 kA L-N 80 kA L-L 80 kA L-G 80 kA N-G 800 kA Total	320 V 550 V 320 V 320 V	L-N L-L L-G N-G	410 V 686 V 420 V 806 V	1,050 V 1,344 V 1,262 V 1,575 V
3N2	240 V 3Ø Delta (NN) (3 wire + ground)	80 kA L-L 80 kA L-G 480 kA Total	320 V 320 V	L-L L-G	420 V 420 V	1,262 V 1,262 V
3N4	480 V 3Ø Delta (NN) (3 wire + ground)	80 kA L-L 80 kA L-G 480 kA Total	550 V 550 V	L-L L-G	686 V 686 V	1,344 V 1,344 V

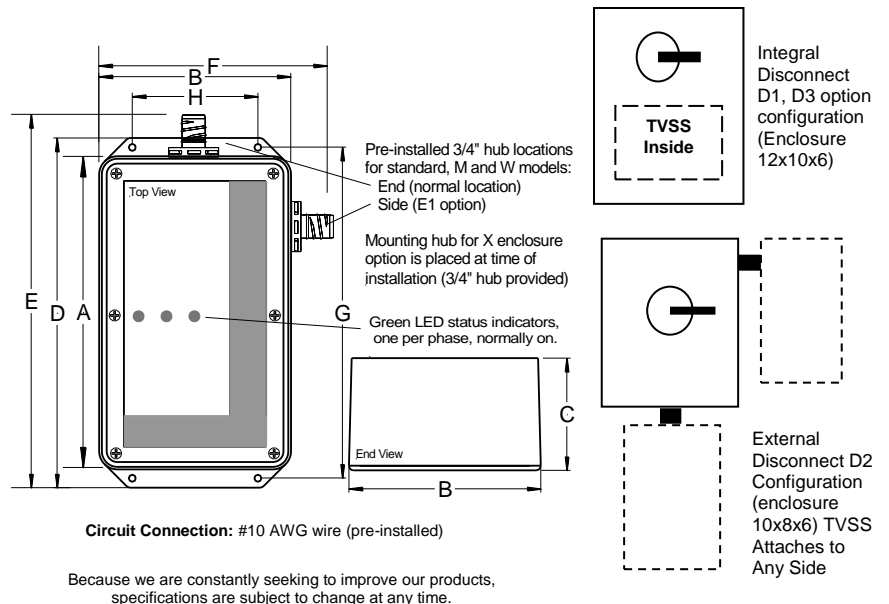
Let-through Voltage Test Parameters: Positive Polarity, Net voltages are peak (±10%). All tests are static except 150 V MCOV modes. Let-through voltages on static tests calculated by subtracting sinewave peak from let-through measured from zero. 150 V MCOV mode let-through voltages measured from the 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-LSEA3Y2D3

Base Model: ST-LSE	SPD type: A, B, C, D	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
 - P** = Flush Mount Plate
 - 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
 - X3** = 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.*
 Type 1 SPDs are intended for installation on the line side of the service equipment

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)	11 (4.99)



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

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