

# Model: ST-SHDLxM

600 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 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-SHDLx series was developed for use at high ampacity service entrances, distribution panels, and disconnects. This versatile unit is robust enough to handle the punishment of the largest industrial service entrance applications while still providing protection from transients that are generated inside the facility. This device is especially well suited for lightning prone locations as well as locations within or adjacent to transient generating industrial facilities.

**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 12 Rated, painted steel enclosure  
(Other enclosure options available see pg. 2)

**SPD Type:** Type 1 SPD (SHDLCM, SHDLDM)  
Type 2 SPD (SHDLBM, SHDLAM)

**Nominal Discharge Current (I<sub>n</sub>) Rating:** 20 kA (SHDLBM, SHDLDM) 10 kA (SHDLCM, SHDLAM)

**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	-	1000	1800	-
3N2	-	-	1000	-	-	1000	-
3N4	-	-	1500	-	-	1500	-



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)	200 kA L-N 200 kA L-L 200 kA L-G 200 kA N-G 1,200 kA Total	150 V 300 V 150 V 150 V	L-N L-L L-G N-G	292 V 441 V 296 V 451 V	899 V 1,195 V 1,085 V 1,115 V
3Y1	120/208 V 3Ø Wye (4 wire + ground)	200 kA L-N 200 kA L-L 200 kA L-G 200 kA N-G 2,000 kA Total	150 V 300 V 150 V 150 V	L-N L-L L-G N-G	292 V 441 V 296 V 451 V	899 V 1,195 V 1,085 V 1,115 V
3D1	120/240 V 3Ø High-Leg Delta (4 wire + ground)	200 kA L-N 200 kA L-L 200 kA HL-N 200 kA L-G 200 kA HL-G 200 kA N-G 2,000 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	292 V 462 V 441 V 296 V 457 V 451 V	899 V 1,142 V 1,195 V 1,085 V 1,226 V 1,115 V
3Y2	277/480 V 3Ø Wye (4 wire + ground)	200 kA L-N 200 kA L-L 200 kA L-G 200 kA N-G 2,000 kA Total	320 V 550 V 320 V 320 V	L-N L-L L-G N-G	462 V 735 V 457 V 796 V	1,142 V 1,531 V 1,226 V 1,467 V
3N2	240 V 3Ø Delta (NN) (3 wire + ground)	200 kA L-L 200 kA L-G 1,200 kA Total	320 V 320 V	L-L L-G	457 V 457 V	1,226 V 1,226 V
3N4	480 V 3Ø Delta (NN) (3 wire + ground)	200 kA L-L 200 kA L-G 1,200 kA Total	550 V 550 V	L-L L-G	735 V 735 V	1,531 V 1,531 V

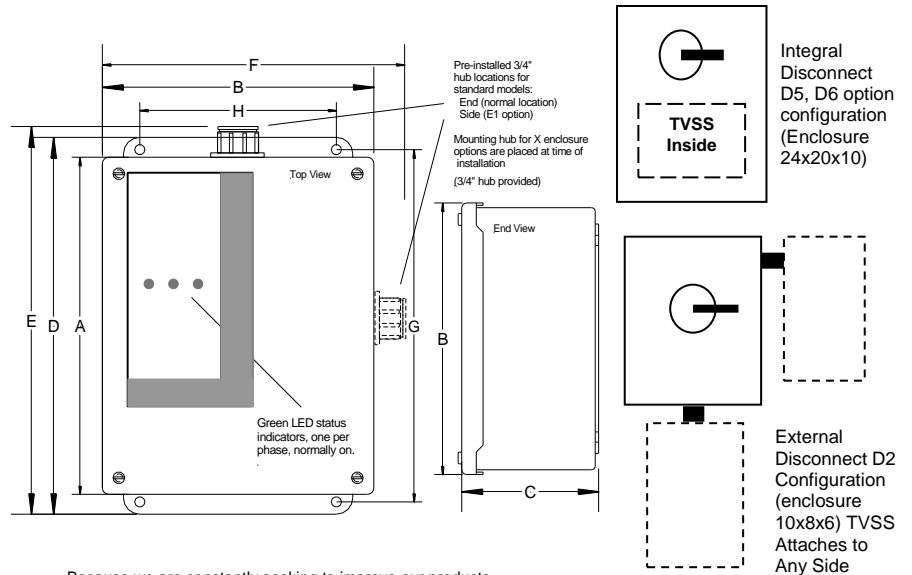
**Let-through Voltage Test Parameters:** Positive Polarity, Net voltages are peak (±10%). All tests are static except 150 V MCOV modes. Let-through voltages on static tests calculated by subtracting sinewave peak from let-through measured from zero. 150 V MCOV mode let-through voltages measured from 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-SHDLA3Y2D6

Base Model: ST-SHDL	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
  - D2** = External non-fused disconnect switch (TVSS mounts to outside)
  - D5** = Integral, non-fused disconnect switch (TVSS unit mounts inside)
  - D6** = Same as **D5**, except no external handle
  - E1** = Hub on side of enclosure
  - LP** = Remote LEDs in individual NEMA 4X housings
  - 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
  - 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.*  
 Type 1 SPDs are intended for installation on the line side of the service equipment

Enclosure Dimensions			
Inches (mm)	Standard Model	Enclosure Options	
		W	X
A	14.00 (356)	14.00 (356)	18.00 (458)
B	12.00 (305)	12.00 (305)	16.00 (407)
C	6.00 (153)	6.00 (153)	10.00 (254)
D	15.50 (394)	15.50 (394)	19.50 (496)
E	15.98 (406)	15.98 (406)	19.98 (508)
F	13.23 (309)	13.23 (309)	17.23 (411)
G	14.75 (375)	14.75 (375)	18.94 (482)
H	10.00 (254)	10.00 (254)	14.00 (356)
Type	NEMA 12 Steel	NEMA 4 Steel	NEMA 4X Composite
lbs. (kg)	30 (13.61)	30 (13.61)	55 (24.95)




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

Rev Date: 08/09/15

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

**Mounting:** 3/4" hub (provided) and integral feet

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