

# External Modular SPDs

## Square D™ External Panel Surge Protective Devices

Square D™ brand Surgeloc™ external modular panel Surge Protective Devices (SPDs) deliver specification grade performance for service entrance or critical branch panel applications. This multi-phase surge suppression system provides transient suppression, noise filtration, and sine wave tracking in a durable, modular package.



by Schneider Electric

# External Modular SPDs Features



External panel modular Surge Protective Devices (SPDs) provide superior design and service life for a wide variety of commercial, industrial, or institutional applications. Square D brand Surgelogic SPDs offer first-rate performance and surge suppression for demanding service entrance applications or as part of a suppression network. The robust modular construction minimizes possible down time and helps to reduce maintenance costs.

## Superior Performance

Surgelogic SPDs utilize a high-energy suppression circuit that provides 10 modes of suppression from 100,000 to 480,000 peak Amps of surge current rating per phase. Modular SPDs contain a suppression circuit that not only provides additional transient surge suppression, but also noise filtration. An optional sine wave tracking module delivers increased filtering and clamping.

For harsh environments, stainless steel NEMA 4X rated external modular products provide surge suppression in areas that can damage other enclosures.

## Easy Installation

External panel SPDs mount adjacent to the equipment through a conduit connection and as close to the circuit breaker as possible in order to reduce lead lengths and improve surge suppression.

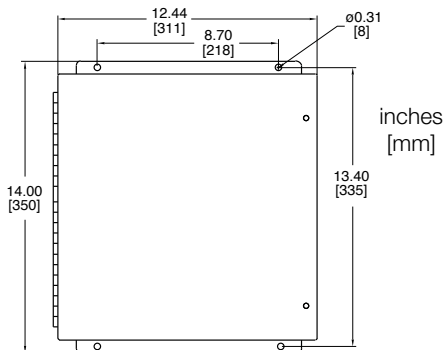
## Warranty

Surgelogic external modular SPDs have a 10-year warranty.

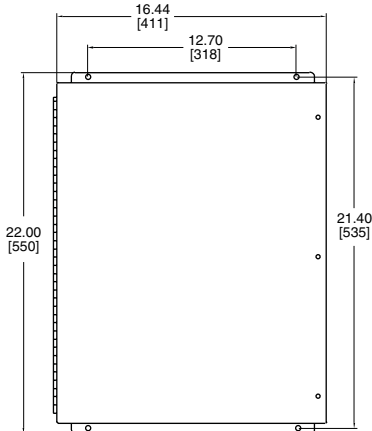
FEATURES	ADVANTAGES	BENEFITS
NEMA 3R or 4X Rated	Allows installation in outdoor applications	Provides suppression to vulnerable equipment powered from weather exposed panels
100,000 to 480,000 Amp Capacity (depending on model)	Longer service life and suppression against high-energy lightning strikes	High performance surge suppression even in severe electrical conditions
Optional EMI/RFI filtering (sine wave tracking) module	Increased clamping and greater noise filtration	Improves surge suppression and reduces high frequency noise
Advanced Diagnostics	Allows for visual indication/testing of the suppressor's functionality	Provides immediate response if suppressor is damaged
Suppression Status Alarms	Allows multiple methods of alarm notification	Provides immediate notification through audible, visual and remote signaling if reduced suppression occurs
Coordinated Fuse Technology	Coordinated fusing allows disconnection methods for thermal and high-current events	Provides premium surge suppression while managing both thermal and high-current end-of-life events

# External Modular SPDs

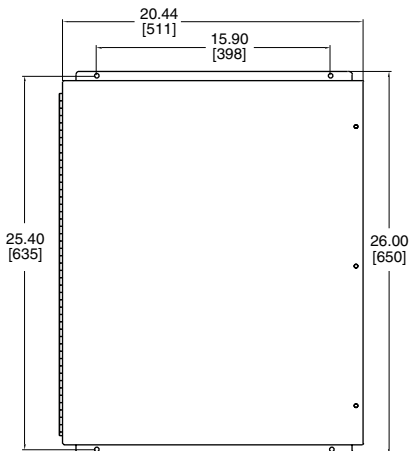
## Features (continued)



Depth: 6 in [152.4 mm]  
Weight: 22lbs ± 2lbs  
NEMA 3R, Carbon steel enclosure



Depth: 6 in [152.4 mm]  
Weight: 31lbs ± 7lbs  
NEMA 3R, Carbon steel enclosure with or without integral switch  
NEMA 4X, Stainless steel enclosure with or without integral switch



Depth: 6 in [152.4 mm]  
Weight: 56lbs ± 2lbs  
NEMA 3R, Carbon steel enclosures for 320 kA and 480 kA units with integral switch

## External SPDs

### Performance

Surge Current Rating per Phase	Up to 480kA
Short Circuit Current Rating	200kA
Modes of Protection	6, 10
Fusing	Individually fused MOVs
Thermal Fusing	Yes
Overcurrent Fusing	Yes
EMI/RFI Filtering	-54 dB at 100 kHz*
Operating Frequency	50/60 Hz

### Mechanical Description

Enclosure	Carbon Steel or Stainless Steel
NEMA Ratings	NEMA 3R or 4X
Connection Method	#10-#2 AWG Terminals
Mounting Method/Circuit Type	Parallel
Operating Altitude	Sea Level-12,000' (3,658 m)
Storage Temperature	-40 °F (-40 °C) to 149 °F (65 °C)
Operating Temp.	-4 °F (-20 °C) to 149 °F (65 °C)
LCD Operating Temp.	14 °F (-10 °C) to 140 °F (60 °C)
Operating Humidity	0 to 95% non-condensing

### Diagnostics

Push to test diagnostic switches, red and green status LEDs per phase (internal redundant status LEDs are green), module status LEDs per mode, dry contacts, audible alarm with disable switch, surge counter.

### Options

- EMI/RFI filtering (sine wave tracking) module
- NEMA 4X rating with stainless steel enclosure
- Integral switch
- Flush mount kit (for panel sizes 12"x12"x6" and 16"x20"x6" only)
- Remote monitor

### Listings and Performance

cULus Listed per UL1449 3rd Ed. Type 1 SPD, UL 1283 5th Ed., CSA C22.2 No. 8-M1986  
Complies with UL 96A 12th Ed. Master Label requirements for Lightning Protection Systems

\* with optional sine wave tracking module

# External Modular SPDs Specifications

## WYE Configured SPD Specifications

Voltage	Surge Current per Phase	Modes of Protection	Configuration	Model Number	MCOV	I <sub>n</sub>	VPR			
							L-N	L-G	L-L	N-G
120/240V	120kA	6	1 Ø, 3-wire+G	TVS1EMA12_	150V	20kA	700V	700V	1200V	700V
208Y/120V ■	120kA	10	3 Ø, Wye, 4-wire+G	TVS2EMA12_	150V	20kA	700V	700V	1200V	700V
480Y/277V ▲	120kA	10	3 Ø, Wye, 4-wire+G	TVS4EMA12_	320V	20kA	1200V	1200V	2000V	1200V
600Y/347V	120kA	10	3 Ø, Wye, 4-wire+G	TVS8EMA12_	420V	20kA	1500V	1500V	2500V	1500V
120/240V	160kA	6	1 Ø, 3-wire+G	TVS1EMA16_	150V	20kA	700V	700V	1200V	700V
208Y/120V ■	160kA	10	3 Ø, Wye, 4-wire+G	TVS2EMA16_	150V	20kA	700V	700V	1200V	700V
480Y/277V ▲	160kA	10	3 Ø, Wye, 4-wire+G	TVS4EMA16_	320V	20kA	1200V	1200V	2000V	1200V
600Y/347V	160kA	10	3 Ø, Wye, 4-wire+G	TVS8EMA16_	420V	20kA	1500V	1500V	2500V	1500V
120/240V	240kA	6	1 Ø, 3-wire+G	TVS1EMA24_	150V	20kA	700V	700V	1200V	700V
208Y/120V ■	240kA	10	3 Ø, Wye, 4-wire+G	TVS2EMA24_	150V	20kA	700V	700V	1200V	700V
480Y/277V ▲	240kA	10	3 Ø, Wye, 4-wire+G	TVS4EMA24_	320V	20kA	1200V	1200V	2000V	1200V
600Y/347V	240kA	10	3 Ø, Wye, 4-wire+G	TVS8EMA24_	420V	20kA	1500V	1500V	2500V	1500V
120/240V	320kA	6	1 Ø, 3-wire+G	TVS1EMA32_	150V	20kA	700V	700V	1200V	700V
208Y/120V ■	320kA	10	3 Ø, Wye, 4-wire+G	TVS2EMA32_	150V	20kA	700V	700V	1200V	700V
480Y/277V ▲	320kA	10	3 Ø, Wye, 4-wire+G	TVS4EMA32_	320V	20kA	1200V	1200V	2000V	1200V
600Y/347V	320kA	10	3 Ø, Wye, 4-wire+G	TVS8EMA32_	420V	20kA	1500V	1500V	2500V	1500V
120/240V	480kA	6	1 Ø, 3-wire+G	TVS1EMA48_	150V	20kA	700V	700V	1200V	700V
208Y/120V ■	480kA	10	3 Ø, Wye, 4-wire+G	TVS2EMA48_	150V	20kA	700V	700V	1200V	700V
480Y/277V ▲	480kA	10	3 Ø, Wye, 4-wire+G	TVS4EMA48_	320V	20kA	1200V	1200V	2000V	1200V
600Y/347V	480kA	10	3 Ø, Wye, 4-wire+G	TVS8EMA48_	420V	20kA	1500V	1500V	2500V	1500V

■ 208Y/120 series also applies to the following voltage 220Y/127

▲ 480Y/277 series also applies to the following voltages 380Y/220, 400Y/230, and 415Y/240

Model numbers not recognized as line items in Schneider Electric ordering system until a suffix code is applied

### WYE MODEL NUMBER SUFFIX CODES

A = NEMA 3R, steel enclosure (e.g. TVS4EMA12A)

ASWT = NEMA 3R, steel enclosure with sine wave tracking module (e.g. TVS4EMA12ASWT)

AI = NEMA 3R, steel enclosure with integral switch (e.g. TVS4EMA12AI)

AISWT = NEMA 3R, steel enclosure with integral switch and sine wave tracking module (e.g. TVS4EMA12AISWT)

S = NEMA 4X, stainless steel enclosure (e.g. TSV4EMA12S)

SSWT = NEMA 4X, stainless steel enclosure with sine wave tracking module (e.g. TVS4EMA12SSWT)

SI = NEMA 4X, stainless steel enclosure with integral switch (e.g. TVS4EMA12SI) only in 120, 160, and 240kA surge currents

SISWT = NEMA 4X, stainless steel enclosure with integral switch and sine wave tracking module (e.g. TVS4EMA12SISWT) only in 120, 160, and 240kA surge currents

# External Modular SPDs Specifications (continued)

## Delta Configured SPD Specifications

Voltage	Surge Current per Phase	Modes of Protection	Configuration	Model Number	MCOV	I <sub>n</sub>	VPR			
							L-N	L-G	L-L	N-G
240V DELTA	100kA	6	3 Ø, Delta, 3-wire+G	TVS6EMA10_	300V	20kA	N/A	1200V	1200V	N/A
480V DELTA	100kA	6	3 Ø, Delta, 3-wire+G	TVS5EMA10_	640V	20kA	N/A	1800V	2000V	N/A
600V DELTA	100kA	6	3 Ø, Delta, 3-wire+G	TVS9EMA10_	700V	10kA	N/A	2500V	2500V	N/A
240V DELTA	120kA	6	3 Ø, Delta, 3-wire+G	TVS6EMA12_	300V	20kA	N/A	1200V	1200V	N/A
480V DELTA	120kA	6	3 Ø, Delta, 3-wire+G	TVS5EMA12_	640V	20kA	N/A	1800V	2000V	N/A
600V DELTA	120kA	6	3 Ø, Delta, 3-wire+G	TVS9EMA12_	700V	10kA	N/A	2500V	2500V	N/A
240V DELTA	160kA	6	3 Ø, Delta, 3-wire+G	TVS6EMA16_	300V	20kA	N/A	1200V	1200V	N/A
480V DELTA	160kA	6	3 Ø, Delta, 3-wire+G	TVS5EMA16_	640V	20kA	N/A	1800V	2000V	N/A
600V DELTA	160kA	6	3 Ø, Delta, 3-wire+G	TVS9EMA16_	700V	10kA	N/A	2500V	2500V	N/A
600V DELTA	180kA	6	3 Ø, Delta, 3-wire+G	TVS9EMA18_	700V	10kA	N/A	2500V	2500V	N/A
240V DELTA	200kA	6	3 Ø, Delta, 3-wire+G	TVS6EMA20_	300V	20kA	N/A	1200V	1200V	N/A
480V DELTA	200kA	6	3 Ø, Delta, 3-wire+G	TVS5EMA20_	640V	20kA	N/A	1800V	2000V	N/A
600V DELTA	200kA	6	3 Ø, Delta, 3-wire+G	TVS9EMA20_	700V	10kA	N/A	2500V	2500V	N/A
240V DELTA	240kA	6	3 Ø, Delta, 3-wire+G	TVS6EMA24_	300V	20kA	N/A	1200V	1200V	N/A
480V DELTA	240kA	6	3 Ø, Delta, 3-wire+G	TVS5EMA24_	640V	20kA	N/A	1800V	2000V	N/A
600V DELTA	240kA	6	3 Ø, Delta, 3-wire+G	TVS9EMA24_	700V	10kA	N/A	2500V	2500V	N/A
240V DELTA	320kA	6	3 Ø, Delta, 3-wire+G	TVS6EMA32_	300V	20kA	N/A	1200V	1200V	N/A
480V DELTA	320kA	6	3 Ø, Delta, 3-wire+G	TVS5EMA32_	640V	20kA	N/A	1800V	2000V	N/A
600V DELTA	320kA	6	3 Ø, Delta, 3-wire+G	TVS9EMA32_	700V	10kA	N/A	2500V	2500V	N/A
240V DELTA	480kA	6	3 Ø, Delta, 3-wire+G	TVS6EMA48_	300V	20kA	N/A	1200V	1200V	N/A
480V DELTA	480kA	6	3 Ø, Delta, 3-wire+G	TVS5EMA48_	640V	20kA	N/A	1800V	2000V	N/A

## High-Leg Delta (HLD) Configured SPD Specifications

Voltage	Surge Current per Phase	Modes of Protection	Configuration	Model Number	MCOV	I <sub>n</sub>	VPR						
							L-N	H-N	L-G	H-G	L-L	H-L	N-G
240/120HLD	120kA	10	3 Ø, HLD*, 4-wire+G	TVS3EMA12_	150V	20kA	700V	1200V	1200V	1000V	1200V	1500V	700V
240/120HLD	160kA	10	3 Ø, HLD*, 4-wire+G	TVS3EMA16_	150V	20kA	700V	1200V	1200V	1000V	1200V	1500V	700V
240/120HLD	240kA	10	3 Ø, HLD*, 4-wire+G	TVS3EMA24_	150V	20kA	700V	1200V	1200V	1000V	1200V	1500V	700V
240/120HLD	320kA	10	3 Ø, HLD*, 4-wire+G	TVS3EMA32_	150V	20kA	700V	1200V	1200V	1000V	1200V	1500V	700V
240/120HLD	480kA	10	3 Ø, HLD*, 4-wire+G	TVS3EMA48_	150V	20kA	700V	1200V	1200V	1000V	1200V	1500V	700V

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### DELTA AND HLD MODEL NUMBER SUFFIX CODES

A = NEMA 3R, steel enclosure (e.g. TVS5EMA12A)

AI = NEMA 3R, steel enclosure with integral switch (e.g. TVS5EMA12AI)

S = NEMA 4X, stainless steel enclosure (e.g. TSV5EMA12S)

SI = NEMA 4X, stainless steel enclosure with integral switch (e.g. TVS5EMA12SI) only in 120, 160, and 240kA surge currents

# External Modular SPDs Specifications (continued)

## High Resistance Ground (HRG) Configured SPD Specifications

Voltage	Surge Current per Phase	Modes of Protection	Configuration	Model Number	MCOV	I <sub>n</sub>	VPR			
							L-N	L-G	L-L	N-G
480Y/277V ▲	100kA	6	3 Ø, HRG, 3-wire+G	TVS4HEMA10_	640V	20kA	N/A	1800V	2000V	N/A
600Y/347V	100kA	6	3 Ø, HRG, 3-wire+G	TVS8HEMA10_	700V	10kA	N/A	2500V	2500V	N/A
480Y/277V ▲	120kA	6	3 Ø, HRG, 3-wire+G	TVS4HEMA12_	640V	20kA	N/A	1800V	2000V	N/A
600Y/347V	120kA	6	3 Ø, HRG, 3-wire+G	TVS8HEMA12_	700V	10kA	N/A	2500V	2500V	N/A
480Y/277V ▲	160kA	6	3 Ø, HRG, 3-wire+G	TVS4HEMA16_	640V	20kA	N/A	1800V	2000V	N/A
600Y/347V	160kA	6	3 Ø, HRG, 3-wire+G	TVS8HEMA16_	700V	10kA	N/A	2500V	2500V	N/A
600Y/347V	180kA	6	3 Ø, HRG, 3-wire+G	TVS8HEMA18_	700V	10kA	N/A	2500V	2500V	N/A
480Y/277V ▲	200kA	6	3 Ø, HRG, 3-wire+G	TVS4HEMA20_	640V	20kA	N/A	1800V	2000V	N/A
600Y/347V	200kA	6	3 Ø, HRG, 3-wire+G	TVS8HEMA20_	700V	10kA	N/A	2500V	2500V	N/A
480Y/277V ▲	240kA	6	3 Ø, HRG, 3-wire+G	TVS4HEMA24_	640V	20kA	N/A	1800V	2000V	N/A
600Y/347V	240kA	6	3 Ø, HRG, 3-wire+G	TVS8HEMA24_	700V	10kA	N/A	2500V	2500V	N/A
480Y/277V ▲	320kA	6	3 Ø, HRG, 3-wire+G	TVS4HEMA32_	640V	20kA	N/A	1800V	2000V	N/A
600Y/347V	320kA	6	3 Ø, HRG, 3-wire+G	TVS8HEMA32_	700V	10kA	N/A	2500V	2500V	N/A
480Y/277V ▲	480kA	6	3 Ø, HRG, 3-wire+G	TVS4HEMA48_	640V	20kA	N/A	1800V	2000V	N/A

■ 208Y/120 series also applies to the following voltage 220Y/127 ▲ 480Y/277 series also applies to the following voltages 380Y/220, 400Y/230, and 415Y/240

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### HRG MODEL NUMBER SUFFIX CODES

A = NEMA 3R, steel enclosure (e.g. TVS4HEMA12A)

AI = NEMA 3R, steel enclosure with integral switch (e.g. TVS4HEMA12AI)

S = NEMA 4X, stainless steel enclosure (e.g. TSV4HEMA12S)

SI = NEMA 4X, stainless steel enclosure with integral switch (e.g. TVS4HEMA12SI) only in 120, 160, and 240kA surge currents

## Enclosure Size Determination

Enclosure Type	Surge Current Rating (kA)	
	100-240*	320-480**
Steel enclosure, NEMA Type 3R	12"x12"	16"x20"
Stainless steel enclosure, NEMA Type 4X	16"x20"	16"x20"
Steel enclosure, NEMA Type 3R with integral switch	16"x20"	20"x24"
Stainless steel enclosure, NEMA Type 4X with integral switch	16"x20"	N/A
Steel or stainless steel enclosure, NEMA Type 3R or 4X with sine wave tracking module	16"x20"	16"x20"
Steel enclosure, NEMA Type 3R with integral switch and sine wave tracking module	16"x20"	20"x24"
Stainless steel enclosure, NEMA Type 4X with integral switch and sine wave tracking module	16"x20"	N/A

\* 600Y/347V HRG or 600V Delta: 100-180kA

\*\* 600Y/347V HRG or 600V Delta: 200-320kA

### SPD ACCESSORIES

Remote Monitor	TVS12RMU
12"x12" Flush Mount Kit	TVS12FMK
16"x20" Flush Mount Kit	TVS20FMK

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