



SURGE PROTECTION N.A.

PRODUCT LINE SNAPSHOT

January 2018

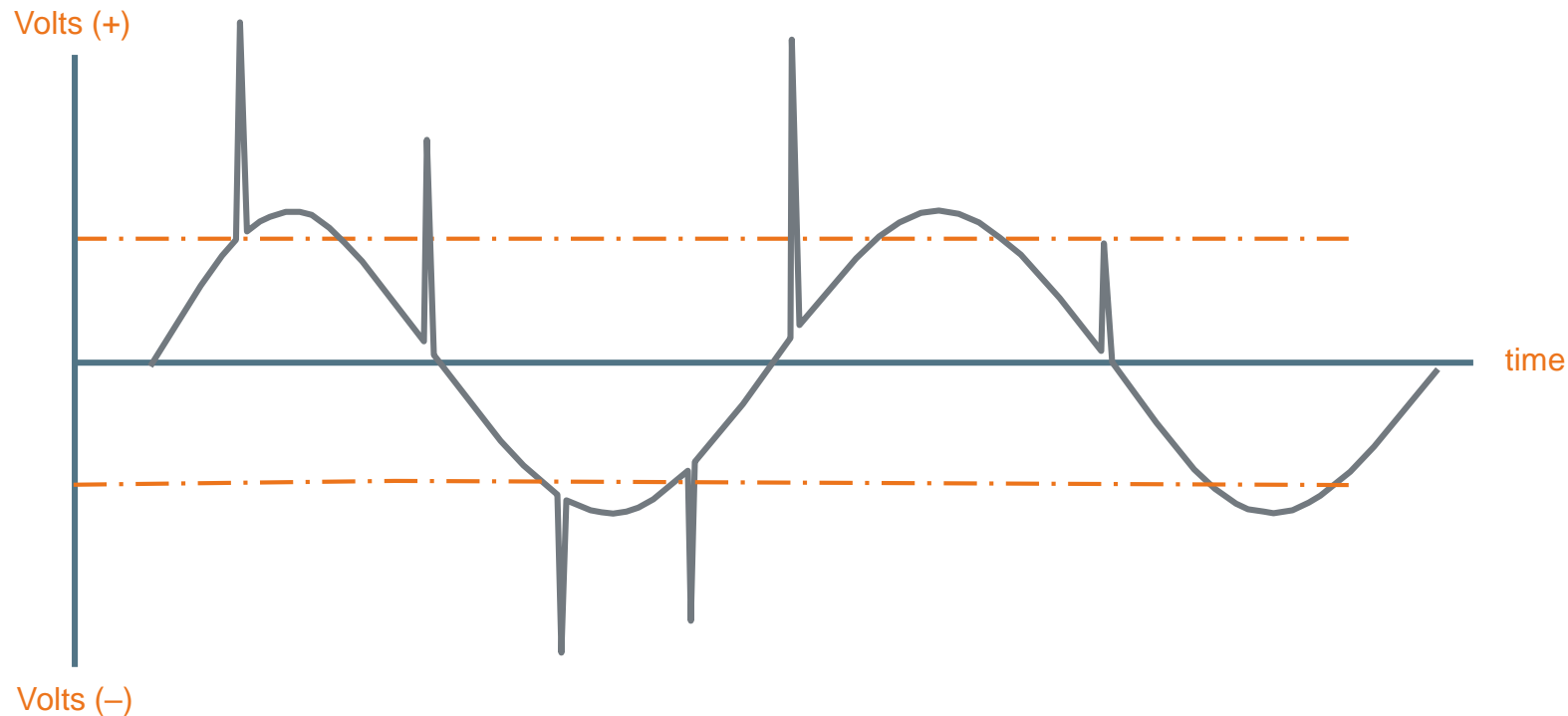


PRELIMINARY QUESTIONS

- **WHAT IS SURGE PROTECTION?**
- **MORE IMPORTANTLY, WHY DOES ONE NEED IT?**

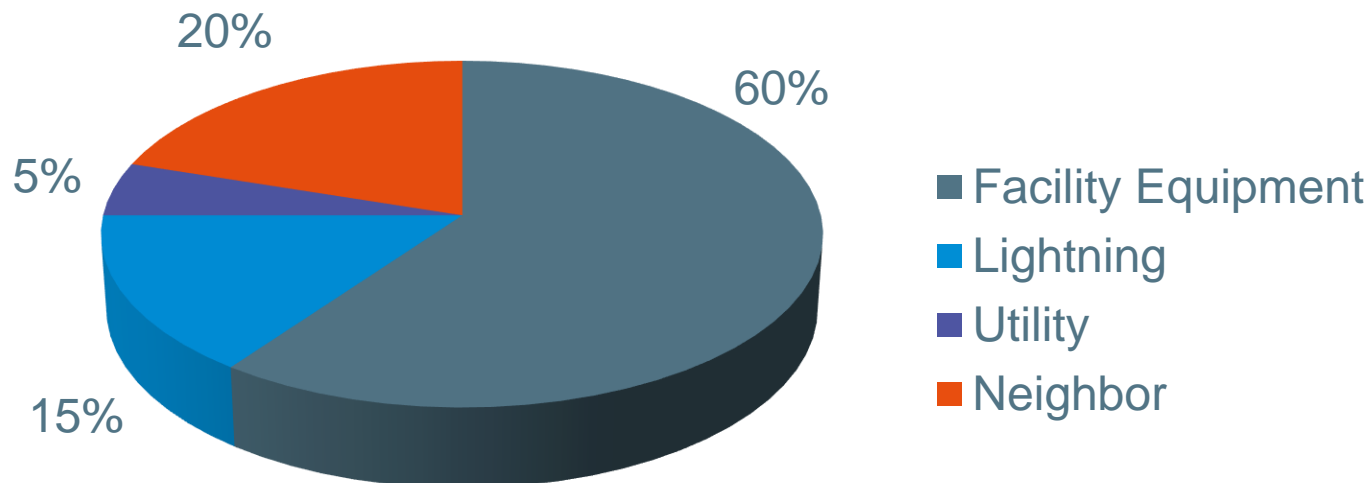
WHAT ARE VOLTAGE SURGES: DEFINITION

- **BRIEF (*MICROSECONDS*) OVERVOLTAGE SPIKES OR DISTURBANCES (*UP TO TENS OF THOUSANDS OF VOLTS*) ON A POWER WAVEFORM THAT CAN DAMAGE, DEGRADE, OR DESTROY ELECTRONIC EQUIPMENT**



WHAT ARE VOLTAGE SURGES: SOURCES

- **SURGES CAN ORIGINATE FROM INSIDE (INTERNAL SOURCES) OR OUTSIDE (EXTERNAL SOURCES) A FACILITY**
 - 60-80% of Surges originate from within the facility



HOW TO SPECIFY AND APPLY

■ SPD TERMINOLOGY

- Maximum Continuous Operating Voltage (**MCOV**)
 - Max RMS voltage that may be *continuously* applied to MOV
- Nominal Discharge Current (**I_n**)
 - Stress test to measure durability of product
 - Type 1 – 20kA or 10kA
 - Type 2 – 20kA, 10kA, 5kA or 3kA
 - Type 3 – 3kA
- Voltage Protection Rating (**VPR**)
 - Measurement of the limiting voltage (Let-through or clamping voltage)
- Maximum Discharge Current or Surge Rating (**I_{max}**)
 - Measurement of longevity (Not an official UL measurement)

HOW TO SPECIFY AND APPLY

■ SURGE PROTECTION IN THE NEC CODE (2017)



Article	Description
620.51	Emergency system loads (elevators, escalators, moving sidewalks, etc)
645.18	Critical Operations Data Systems
670.6	Industrial machinery with safety interlock circuits
694.7	Wind Electric Systems
695.15	Fire Pump Controllers
700.8	All Emergency Systems Switchboards and Panelboards
708.2	Critical Operation Power Systems (HVAC, Fire Alarms, Security)

SPD COMPONENTS FEATURES AND BENEFITS

TPMOV®

Thermally Protected MOV

Mersen Patented Technology used by all of the leading electrical manufacturers in the industry

50kA to 75kA

ROBUST 50kA standard surge capacity with premium option for 75kA

34mm block design leads to longer product life and extends maximum surge capacity

20kA I_n

Nominal Discharge Current Rating

Highest achievable value allowed by UL 1449 4th Edition

10+ Million units shipped

Since its inception in 2005. The most popular, best performing, consistent quality product available on the market



UL 1449 4th Edition

Type 1 Component Assembly

RoHS Compliant

200kA SCCR



NO BACK-UP FUSE REQUIRED

TPMOV® Technology - Dynamic thermal disconnection system provides 200kA SCCR without back-up fusing

Made in Mexico

Local, high quality, consistent production with years of experience and high demand reaction capability

Customization

Custom options available

- Short leads for PCB mounting
- Visual indication tabs
- Packaging options
- Tact switch

MERSEN'S TPMOV TECHNOLOGY

<https://www.youtube.com/watch?v=p86t-uuyMAE>

MERSEN SPD UL/CSA PRODUCT PORTFOLIO

SPD COMPONENTS

For OEMs and PCB designers looking for board level components to protect against surge events

Includes:
TPMOV and VSP Fuses



SPD NEMA

Panelmount and Wallmount SPD's for protection of whole-facility or point-of-use equipment

Includes:
STX and STZ series



Components

DIN-Rail

NEMA

In-Line

SPD DIN-Rail

For installation within industrial control cabinets, variable frequency drives, disconnect switches or other power distribution, control and signaling equipment

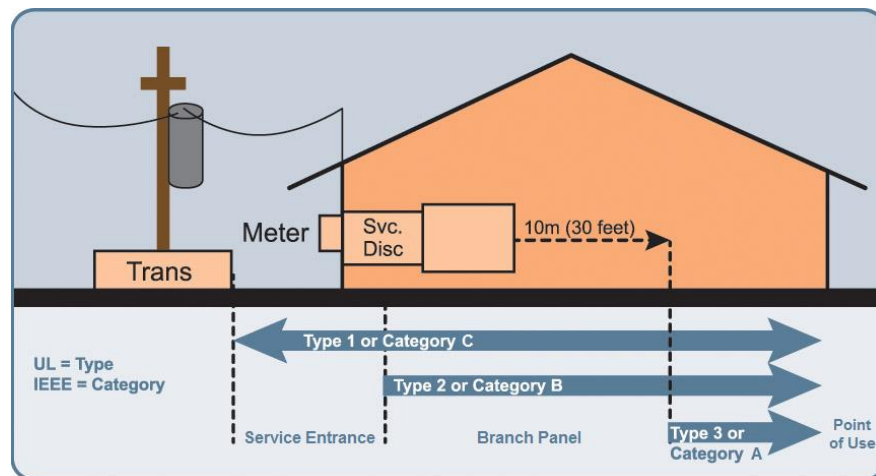


SPD In-Line

For installation within industrial control cabinets, variable frequency drives, disconnect switches or other power distribution, control and signaling equipment



PRODUCT LINE APPLICATION LOCATIONS



IEEE Location Category	Category C	Category B	Category A
Definition	Designed for use in incoming power supply panels where the risk of lightning strike is high	Designed for use in distribution panels located downstream of location Category C or in areas with low exposure to lightning strikes	Always installed > 20m downstream of Category B protection systems designed to protect sensitive equipment
Applications	Outside overhead lines and service entrance	Feeders, short branch circuits, and indoor service panels	Outlets/receptacles, long branch circuits
ANSI/UL 1449 Type Designations	Type 1	Type 2	Type 3
Mersen Surge-Trap® series	STZ		
	STX		
	ST and STP		
		STLB	

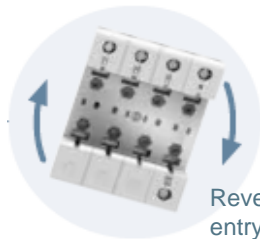
NEW STP SERIES FEATURES & BENEFITS



UL 1449 4th Edition
CSA C22.2 NO. 269
Type 1 Component Assembly

Universal Solutions

ALL NETWORK CONFIGURATIONS
Single Phase, Split Phase, Three-Phase WYE,
Three-Phase DELTA, 120 to 690VAC



Reversible Installation

Reversible chassis to allow cable entry from top or bottom



NO BACK-UP FUSING REQUIRED
TPMOV® Technology - Dynamic thermal disconnection system provides 200kA SCCR without back-up fusing



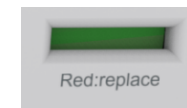
2-year warranty

75kA

HIGHEST SURGE CAPACITY RATING IN THE INDUSTRY
Leads to longer product life and extends maximum surge capacity

Cartridge Security System

- Vibration proof MIL-STD-810E
- Insertion “click” effect
- Mechanical cartridge coding to avoid possible replacement errors



DOUBLE END OF LIFE INDICATION
Visual and *Optional* NO/NC Dry Contact
Clearly visible Green = OK, Red = Replace

Expanded Wire Gauge Range

4-14 AWG

IN-LINE PRODUCT LINE FEATURES AND BENEFITS



UL 1449 4th Ed Type 4 SPD
IEEE/ANSI C62.41.2 – C-High
IEC 61643-11 Type 2+3 SPD

Connection Versatility



Screw terminal
VERSATILE FIXING SYSTEM



SURGE-TESTED LUMINAIRE BY
ACCREDITED SURGE LAB



Double end of life indication

Disconnection + LED



Universal solutions

Safety and universality peace of mind:

- Single / split / three-phase network configurations
- L-N / N-L universality
- Series / parallel wiring

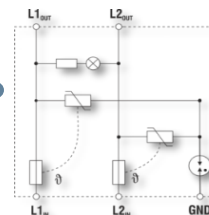
Leakage current free

No dangerous contact voltages



Universal Circuit Configuration

One circuit configuration to address numerous applications and simplify product selection



NEMA PRODUCT LINE FEATURES AND BENEFITS



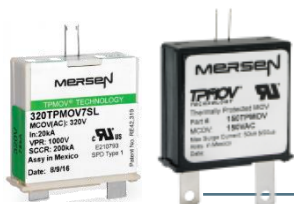
UL 1449 4th Edition Listed
CSA C22.2 Listed
Type 1 SPD

Type 1 SPD

All devices are Type 1 SPDs making them suitable for any and all applications from facility service entrance to individual equipment point-of-use

50 – 450kA

A wide range of surge capacities to fit any and all applications and target markets



Designed with the popular, industry leading, Mersen patented TPMOV[®] Technology. The best performing, most reliable surge suppression technology on the market



NEMA 4X

NEMA 4X enclosure ratings are standard for all configurations

STX R 480Y 05

Simple, easy and clean catalog numbering selection scheme



Designed with the latest printed circuit board technologies and components for optimized footprint, cost and reliability. Made in Mersen's Juarez facility



Options addressing the needs of new and retrofit facility installations

- **LED Status Indicators**
- **Surge Counter**
- **Disconnect Switch**

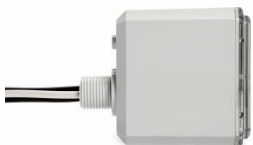
PRODUCT FEATURES AND BENEFITS – STXH

50kA

Surge Capacity

Up to 3 Modes of Protection

L1-N, L2-N, L1-L2



1/2" threaded hub with sealing lock washer. Pre-wired 18" 10AWG

LED Status Indicator

Visual LED Status Indicator
(ON = Protected, OFF = Replace)

3-Year

Warranty



Consumer packaging for distributor over-the-counter sales



Ideal for residential and HVAC
(designed to mate with ACD)
Only available in 120/240V

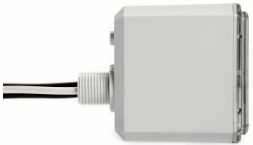
PRODUCT FEATURES AND BENEFITS – STXR

50kA

Surge Capacity

Up to 10 Modes of Protection

L1-N, L2-N, L3-N, L1-G, L2-G, L3-G, L1-L2, L1-L3, L2-L3, N-G



3/4" threaded hub with lock washer. Pre-wired 36" 10AWG

LED and Remote Status Indicators

Visual LED Status Indicator
Optional Audible Alarm and Dry Contact (NO/NC)

5-Year

Warranty



#1 Seller (Basic Unit)

The most cost effective solution for customers looking for UL certification, up to 10 modes of protection, all voltage and system configurations and remote indication

- Target = Individual Equipment
- The eventual replacement for STT2 and STT4X



Optional mounting bracket
(no longer included with product)

PRODUCT FEATURES AND BENEFITS – STXP

100kA

Surge Capacity

Up to 10 Modes of Protection

L1-N, L2-N, L3-N, L1-G, L2-G, L3-G, L1-L2, L1-L3, L2-L3, N-G



3/4" threaded female hub and mounting feet. Pre-wired 36" 10AWG

LED and Remote Status Phase Loss Indication

Visual LED Status Phase Indicator
Optional Audible Alarm and Dry Contact (NO/NC)

10-Year

Warranty



Enhanced Unit

For customers looking for higher surge capacity, increased warranty period, additional mounting options

- Target = Individual Equipment and Residential



Optional flush mount bracket for in-wall installations. **The only product line with this feature**

PRODUCT FEATURES AND BENEFITS – STXT

200kA

Surge Capacity

Up to 10 Modes of Protection

L1-N, L2-N, L3-N, L1-G, L2-G, L3-G, L1-L2, L1-L3, L2-L3, N-G



3/4" threaded female hub and mounting feet (internal wire lugs)

EMI/RFI Filtering

Cleaner attenuation for finer protection levels

10-Year

Warranty



Premium Unit

For customers looking for premium protection at a lower price compared to others supplying metal NEMA type enclosed units

- Target = Individual Equipment and Service Entrance



This solution does not come pre-wired. Face-plate is removed and connections are made by the customer

PRODUCT FEATURES AND BENEFITS – STZ (INTERNAL)

$\leq 450\text{kA}$

Surge Capacity

Up to 10 Modes of Protection

L1-N, L2-N, L3-N, L1-G, L2-G, L3-G, L1-L2, L1-L3, L2-L3, N-G

Removable HMI

Packaging includes 6' HMI cable for remote mounting of interface

Rotatable HMI

HMI can be rotated 90 degrees depending on cable entry location

15-Year

Warranty



Internal SPD

For customers and panel builders looking to integrate surge protection into an existing panelboard, switchgear, motor control center, etc.

Option A: Basic Option B: Standard

Option A Includes:

LED Status Indicators by Phase
Phase Loss Indication

Option B Includes:

LED Status Indicators by Phase
Phase Loss Indication
Remote Dry Contacts
Audible alarm with Silence Button
EMI/RFI Filter
Surge Counter with Reset Button

Additional Options:

Disconnect Switch and SPD
mounted together on backplane

PRODUCT FEATURES AND BENEFITS – STZ (EXTERNAL)

$\leq 450\text{kA}$

Surge Capacity

Up to 10 Modes of Protection

L1-N, L2-N, L3-N, L1-G, L2-G, L3-G, L1-L2, L1-L3, L2-L3, N-G

Replaceable SPD Module

Field replaceable SPD “brick” to meet construction specification requirements

Rotatable SPD Module

Internal SPD can be rotated 90 degrees depending on cable entry location

15-Year

Warranty



External SPD

Designed to meet the specifications of the construction bid market but also suitable for MRO-retrofit

Option A: Basic Option B: Standard

Option A Includes:

LED Status Indicators by Phase
Phase Loss Indication

Option B Includes:

LED Status Indicators by Phase
Phase Loss Indication
Remote Dry Contacts
Audible alarm with Silence Button
EMI/RFI Filter
Surge Counter with Reset Button

Additional Options

Disconnect Switch (UL98) thru the door handle
NEMA 4 or NEMA 4X enclosure

NEMA SURGE PROTECTIVE DEVICE LINE








MERSEN SURGE-TRAP® FOR TOTAL SURGE PROTECTION

Any facility with motors stopping and starting, light load panels being turned on and off frequently, and other potential power disturbances is at risk for damage caused by a surge spike. Turn to Mersen Surge-Trap for surge protection that covers every voltage need within your facility.



SERIES	STP	STXH	STXR	STXP	STXT	STZ
Mounting Style	DIN-Rail	Panel Mount	Panel Mount	Panel Mount Wall Mount Flush Mount	Panel Mount Wall Mount	Wall Mount
Surge Rating	75kA	50kA	50kA	100kA	100-200kA	100-450kA
Nominal Voltage	120-690VAC	120-240VAC	120-600VAC	120-600VAC	120-600VAC	120-600VAC
Replaceable Module	Yes	No	No	No	No	Yes
Standard Features	End-of-life indication	NEMA 4X LED Indicator	NEMA 4X LED Indicator	NEMA 4X LED Indicator Phase Loss monitoring	NEMA 4X LED Indicator Phase Loss monitoring EMI/RFI Filter	LED Indicator Phase Loss monitoring EMI/RFI Filter Dry contact & audible alarm Surge counter
Optional Features	Dry contact & audible alarm		Dry contact & audible alarm Wall Mount Bracket	Dry contact & audible alarm Flush Mount Bracket	Dry contact & audible alarm	NEMA 4X Disconnect Switch Stand-alone brick option
Warranty	2 years	3 years	5 years	10 years	10 years	15 years
Price	\$\$	\$	\$\$	\$\$\$	\$\$\$\$	\$\$\$\$\$

PRODUCT LINE OVERVIEW

							
Series	TPMOV	VSP	ST	STP	STX	STZ	STLB
Location	OEM Component	OEM Component	Equipment Power and Control Panels	Equipment Power and Control Panels	Equipment, Branch and Service	Service Entrance	LED Lighting Applications
Standards	UL 1449 Type 4CA	UL 4248-14 Fuse	UL 1449 Type 1CA	UL 1449 Type 1CA	UL 1449 Type 1	UL 1449 Type 1	UL 1449 Type 1
I_{max}	50kA	-	50kA	50kA	≤ 200kA	≤ 450kA	10kA
Voltage	150-550VAC	600VAC	120-690VAC 600-1000VDC	120-690VAC 600-1000VDC	120-600VAC	120-600VAC	120-600VAC
Network	1-Phase	1-Phase	1 ph, Split ph, 3ph WYE, 3ph DELTA	1 ph, Split ph, 3ph WYE, 3ph DELTA	1 ph, Split ph, 3ph WYE, 3ph DELTA	1 ph, Split ph, 3ph WYE, 3ph DELTA	1 ph, Split ph, 3ph WYE, 3ph DELTA
Special Features	Lead variations, switch variations	Various mounting configurations	Optional micro switch	Replacement SPD plug	NEMA 4X	NEMA 4X, audible alarm and micro switch, surge counter	NEMA 4X, audible alarm and micro switch, surge counter
	SPD COMPONENTS		SPD DIN-RAIL		SPD NEMA		SPD In-Line

WHO ARE WE TARGETING?

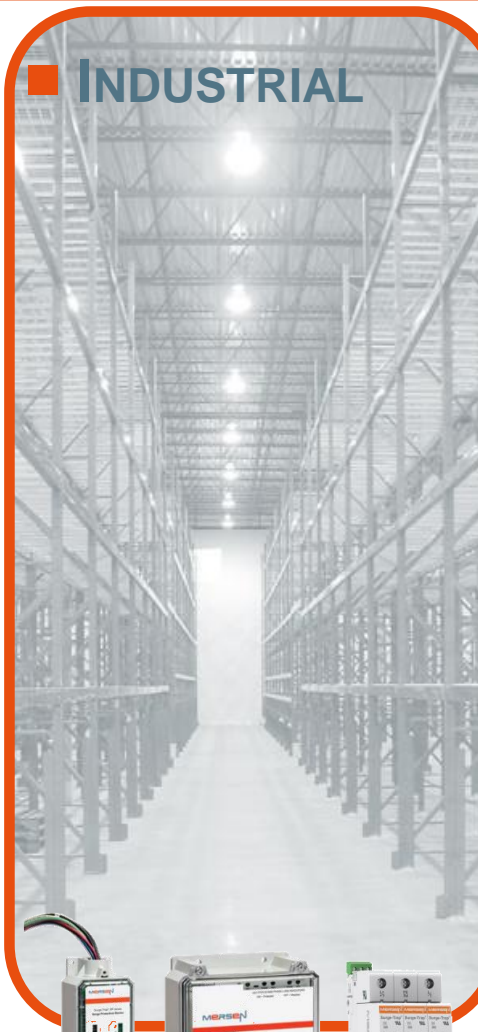
■ CONSTRUCTION



■ RESIDENTIAL



■ INDUSTRIAL



■ HVAC



■ AND MORE...

