

# MERSEN SURGE-TRAP® SPD QUICK APPLICATION GUIDE

## PANEL MOUNT SPD FOR COMMERCIAL & INDUSTRIAL APPLICATIONS

IEEE C62.41 Categories & Surge Environment	Category C	Category B	Category A	
	Service Entrance & Outdoor Loads Line-side or load-side of service entrance	Feeders & Sub distribution Branch Circuit Panels	Device ≥ 30ft (10m) from the electrical service panel to the point of utilization	
Expected voltages & currents	High 10kV – 10kA Low 6kV- 3kA	6kV – 3kA	6kV – 0.5kA	
UL 1449 SPD TYPES	Type 1			
	Type 2			Type 3
Suggested Surge Current Rating* (See considerations)				
High Exposure Level	450 – 300kA	200kA		
Low Exposure Level	300 – 200kA	100kA	50kA	
Series	STZ	STXT	STXP	STXR
Surge Current Rating	450, 300, 200, 150, 100kA	200, 100kA	100kA	50kA
SCCR	200kA (Permits direct connection to most electrical services)			
Standard Features	LED Status Phase loss Indication Form C Contacts Audible Alarm EMI/RFI Filter Surge Counter	NEMA 4X LED Status Phase Loss monitoring EMI/RFI Filter	NEMA 4X LED Status Phase Loss monitoring	NEMA 4X LED Status
Optional Features	NEMA 4X Disconnect Switch Standalone for internal installation, optional HMI port	Form C Contacts audible alarm	Form C Contacts Audible alarm Flush Mount Bracket	Form C Contacts Audible alarm Wall Mount Bracket
Approvals	UL 1449 5th Edition Type 1 SPD - Suitable for Type 1 and 2 applications - CSA C22.2, Type 1 SPD			
Warranty	15 years	10 years	10 years	5 years

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## CONSIDERATION FOR PROPER SELECTION

### Where do I apply surge protection?

Typical SPD applications within industrial, commercial, and residential areas include:

- Power distribution, control cabinets, programmable logic controllers, electronic motor controllers, equipment monitoring, lighting circuits, metering, medical equipment, critical loads, back-up power, UPS, HVAC equipment.
- Communication circuits, telephone lines, cable TV feeds, security systems, alarm signaling circuits.

### Where do I need to install surge protection?

IEEE C62.41.1 defines location categories. These reflect the location in the power system and roughly correspond to UL device types, Category C, B, and A, as shown in the previous page.

Electrical equipment located outside of the building envelope should be considered Category C and Type 1 devices should be utilized at the circuit, because these are more susceptible to external surge events which can bypass the service SPD and enter the building through the external equipment and wiring. Examples of outdoor loads are parking lighting, outdoor HVAC units, gates, water pumps, surveillance cameras.

UL Standard 1449 defines several different types of devices based upon their installation location and use. The three most common are described as follows.

- Type 1 - Permanently connected SPDs intended for installation between the secondary of the service transformer and the line side of the service equipment overcurrent device, as well as the load side, including watt-hour meter socket enclosures and Molded Case SPDs intended to be installed without an external overcurrent protective device.
- Type 2 - Permanently connected SPDs intended for installation on the load side of the service equipment overcurrent device; including SPDs located at the branch panel and Molded Case SPDs.
- Type 3 - Point of use SPDs, installed at a minimum conductor length of 10 meters (30 feet) from the electrical service panel to the point of use, for example cord connected, direct plug-in, receptacle type and SPDs installed at the utilization equipment being protected. See marking in 80.3. The distance (10 meters) is exclusive of conductors provided with or used to attach SPDs.

### How Much Protection Does your Facility Requires?

There is no formula to determine the exact surge current rating that should be used. Mersen provides a recommended kA rating, but it's merely a recommendation based on the IEEE considerations.

- **Exposure Level:**
  - Low: Applications known for low lightning activity, little load switching.
  - High: More severe conditions result from extensive exposure to lightning or unusually severe switching surges
- **Equipment:**
  - How critical is the function of the connected equipment, cost of repair, cost of downtime, equipment sensitivity to surges damage, hardware failure or process upset.
- **Electrical system:**
  - Panel size does not play a major role in the selection of a kA rating.
  - SPD voltage must match application voltage. In cases where the input voltage to a panel is Y configuration, but all the loads are either L-G or L-L reference, a Delta system is the preferred SPD voltage configuration.
  - The SPD at or near service entrance or transformer does not require N-G protection. N-G protection mode is suggested downstream of N-G bond when the unit is installed > 10' (3m) from service entrance or transformer.

Note: this guide is intended for informational purposes only, the electrical specifiers should use their own judgment to determine the need and correct selection of surge protection devices.

Mersen made the diligent efforts to ensure the information to be true and correct, it makes no warranty as to the accuracy and completeness of that Information.

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