

Surge Protection Solutions

Surge-Trap[®]
Type 2 Surge Protective Devices

www.ferrazshawmut.us

Transportation



Power conversion



Power generation
& distribution



Industrial
controls



Power
Quality





Reducing the impact



of transient damage

Surge-Trap® SPD offers a patented fail-safe Type 2 solution and a superior thermal overload technology that delivers higher safety ratings and protection.

Power-related problems cost U.S. companies more than \$80 billion a year. The impact is far-reaching and affects just about every aspect of business. It drives up maintenance and production costs, causes production delays, lost sales, late deliveries, as well as increased spoilage and scrap. Ferraz Shawmut's Surge-Trap Surge Protective Devices (SPD) help minimize power-related problems by protecting sensitive electrical equipment from harmful transients.

Most transients originate from within a facility and nearly 80% of today's overvoltage problems are caused by equipment and power disturbances within the plant. These inner-facility transients are caused by light load panels switching on and off, motors starting and stopping, and close conductor proximity, just to name a few. Less than 20% of transient problems originate outside of the facility due to lightning strikes, utility grid switching, switching of capacitor banks, and electrical accidents.

Transients cause three general types of damage to sensitive electrical equipment, for example:

- **Disruptive** – A voltage transient enters an electronic component which interprets the valid logic command, resulting in system lock-up, malfunctions, faulty output or corrupted files.
- **Dissipative** – A repetitive, short duration energy surge resulting in long-term degradation.
- **Destructive** – Associated with high level energy surges, resulting in immediate equipment failure (most obvious)

When exploring your surge suppression options, keep in mind that not all SPDs are created equally. Most SPDs are designed to function in tandem with fuses. If you need a space-saving option or are looking for ways to reduce costs, then consider an integrated system. Ferraz Shawmut's Surge-Trap is the only SPD featuring our patented TPMOV® technology inside, eliminating the need for additional overcurrent protection.



To evaluate the safety performance of an SPD, look for compliance with IEC 61643-1, UL 1449 Third Edition, RoHS, and ANSI/IEEE C62.41.

Choosing the Right Product is as Easy as 1, 2 3



Choose Your Industry



Agriculture



Medical



Automation



Solar Power



Telecom



Water Treatment



Wind Power



Transportation



The unique benefits

Industries

- Agriculture
- Medical
- Solar Power/ Photovoltaic (see PV Brochure)
- Telecommunication
- Water Treatment
- Wind Power
- Transportation
- Oil & Gas
- Utilities
- Pulp & Paper



Applications

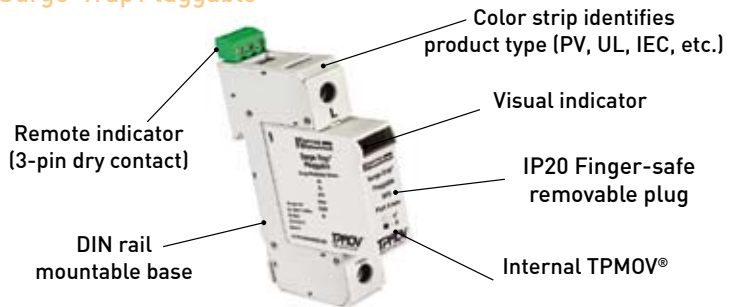
- AC/DC distribution
- Power supplies
- Industrial automation
- Telecommunications
- Motor controls and starter systems
- Programmable logic controller (PLC) applications
- Power transfer equipment
- HVAC applications
- AC drives
- UPS systems
- Security systems
- IT / Data centers
- Medical equipment



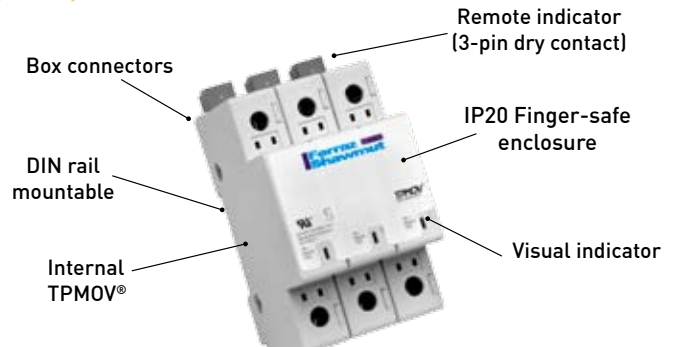
of the Surge-Trap® SPD

The Surge-Trap SPD is a fail-safe Type 2 surge suppressor that is easy to install or retrofit. Direct connection is available with the DIN-rail mount option. The Surge-Trap SPD has a small foot print, visual indicator and an IP20 finger-safe design. Optional remote indicators are available when status to critical control circuits are needed.

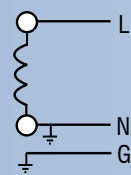
Surge-Trap Pluggable



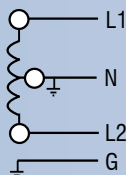
Surge-Trap Modular



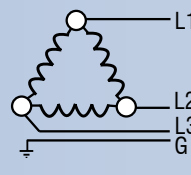
Choose Your Voltage Configuration



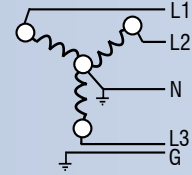
Single Phase
2 Wire + Ground



Split Phase
3 Wire + Ground



3 Phase Delta
3 Wire + Ground



3 Phase Wye
4 Wire + Ground



Surge-Trap® applied in an electrical panel.



Meeting the toughest

world standards

Approvals/Standards

- IEC 61643-1 Type 2
- ANSI/IEEE C62.41
- CE
- RoHS compliant
- UL 1449 Third Edition, File No E210793
- Type 4 UL Recognized Component (tested to SPD Type 2)

Ratings

- 100kA short circuit current rating
- 50kA 8/20 μ s surge capacity (per mode)
- 100kA 8/20 μ s surge capacity (per phase)
- Surge life @ 3kA-8/20 μ s: 5000 events
- Surge life @ 10kA-18/20 μ s: 1000 events
- Operating and storage temperature: -40°C to +85°C
- Wiring range: #6 to #14 AWG

Overvoltage Protection Terms to Know

8/20 current impulse current: impulse with a virtual front time¹ of 8 μ s and a time to half-value² of 20 μ s.

Note 1 The front time is defined according to IEC 60060-1 to be 1.25 x (t90 – t10).

Note 2 The time to half-value is defined as the time between the virtual origin and the 50% point on the tail.

Clamp Voltage: The peak MOV terminal Voltage measured with an applied 8/20 μ s pulse of rated impulse current

Metal Oxide Varistor (MOV): An electronic component that is commonly used to divert excessive current to the ground and/or neutral lines.

***Maximum Continuous Operating Voltage (MCOV):** The maximum rms voltage that may be continuously applied to the SPD for each connected mode.

*Terms are referenced in the table on the reverse side.

Nominal Discharge Current (In): Peak value of the current through the SPD, selected by the manufacturer from a list of predetermined values, having a short-circuit current wave shape of 8/20 μ s where the SPD remains functional after 15 surges.

***Voltage Protection Rating (Up):** A rating per UL 1449 Third Edition, signifying the rounded up average measured limiting voltage of an SPD when the SPD is subjected to the surge produced by a 6 kV, 3kA 8/20 μ s combination waveform generator.

***Short Circuit Current Rating (SCCR):** The suitability of an SPD for use on an AC power circuit that is capable of delivering not more than a declared rms symmetrical current at a declared voltage during a short circuit condition.

Surge Protective Device (SPD): A device that contains at least one nonlinear component and is listed to limit surge voltages and divert surge current.



Choose Your Product

STP/ST	230	TNC	M
STP - Pluggable	Voltage	System Type	Auxiliary Microswitch
ST- Modular	230	TN - TN	Blank - No Microswitch
	400	IT - IT	M - Microswitch Included
	600	TN1 - TN (1 Ph + N)	
	1000	TT1 - TT (1Ph + N)	
		TNC - TNC (3 Ph + PEN)	
		TNS - TNS (3 Ph + N)	
		TT3 - TT (3 Ph + N)	

*Indicates PV - Only

PV - DC

Product Offering

Surge-Trap® Pluggable and Modular Surge Protective Devices

Pluggable and Modular Ordering Information

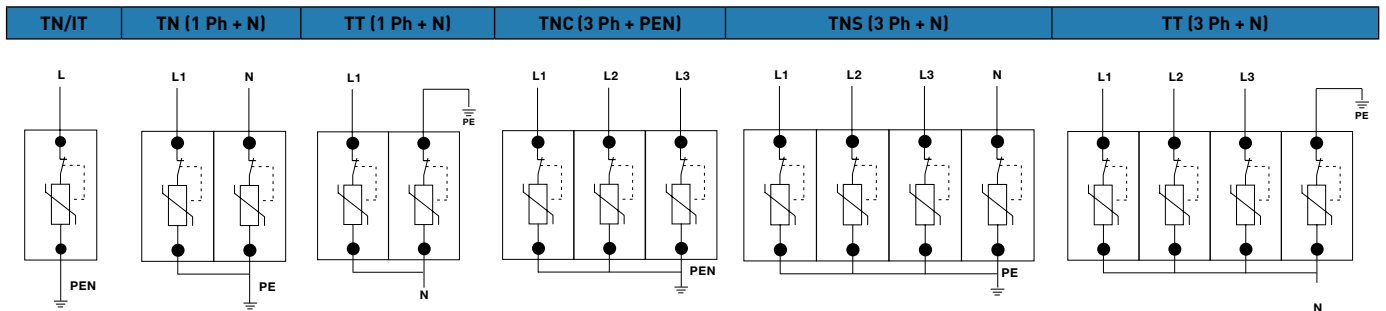
No	Surge-Trap Pluggable System (Includes Base & Plugs)	Nominal Voltage (Vac)	MCOV (Uc) L-PE(N)	No of Poles	System Type	Nominal Discharge Current * (In, kA)	Max. Discharge Current (Imax, 8/20, kA)	Short Circuit Current Rating (SCCR), (kA)	Voltage Protection Level (Up @ In), (kV)	Replacement Plug Part No
1	STP230TNM	230	275	1	TN	20	50	100	< 1.5	SP275E
2	STP400ITM	400	510	1	IT	10	50	100	< 2.0	SP510E
3	STP230TN1M	230	275	2	TN (1 Ph + N)	20	50	100	< 1.5	SP275E, SP150E (N to PE)
4	STP230TT1M	230	425	2	TT (1Ph + N)	20	50	100	< 1.8	SP275E, SP150E (N to PE)
5	STP230TN3M	230	275	3	TNC (3 Ph + PEN)	20	50	100	< 1.5	SP275E
6	STP230TNSM	230	275	4	TNS (3 Ph + N)	20	50	100	< 1.5	SP275E, SP150E (N to PE)
7	STP230TT3M	230	425	4	TT (3 Ph + N)	20	50	100	< 2.0	SP275E, SP150E (N to PE)
8	STP600PVM**	600	675 VDC	2	DC	10	50	100	< 2.0	SP510E
9	STP1000PVM**	1000	1120 VDC	3	DC	10	50	100	< 4.0	SP420E

No	Surge-Trap Modular System	Nominal Voltage (Vac)	MCOV (Uc) L-PE(N)	No of Poles	System Type	Nominal Discharge Current * (In, kA)	Max. Discharge Current (Imax, 8/20, kA)	Short Circuit Current Rating (SCCR), (kA)	Voltage Protection Level (Up @ In), (kV)	Replacement Plug Part No
1	ST230TNM	230	270	1	TN	20	50	100	< 1.5	NA
2	ST400ITM	400	510	1	IT	20	50	100	< 2.0	NA
3	ST230TN1M	230	270	2	TN (1 Ph + N)	20	50	100	< 1.5	NA
4	ST230TT1M	230	420	2	TT (1Ph + N)	20	50	100	< 2.0	NA
5	ST230TN3M	230	270	3	TNC (3 Ph + PEN)	20	50	100	< 1.5	NA
6	ST230TNSM	230	270	4	TNS (3 Ph + N)	20	50	100	< 1.5	NA
7	ST230TT3M	230	420	4	TT (3 Ph + N)	20	50	100	< 2.5	NA
8	ST600PVM**	600	670 VDC	2	DC	20	50	100	< 2.0	NA
9	ST1000PVM**	1000	1120 VDC	3	DC	20	50	100	< 4.0	NA

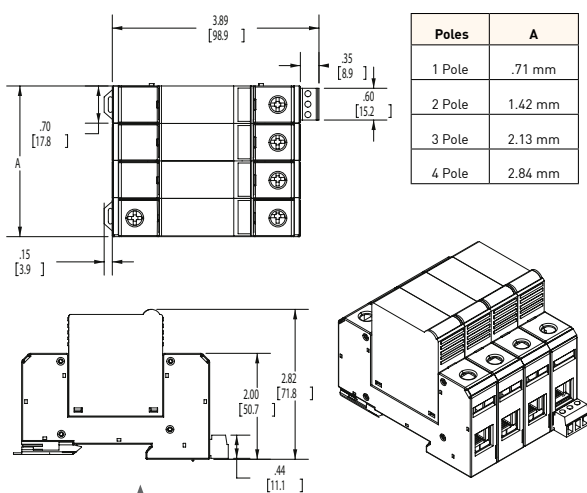
*Values based upon SPD Type 2 testing

**See Surge-Trap PV brochure for product details

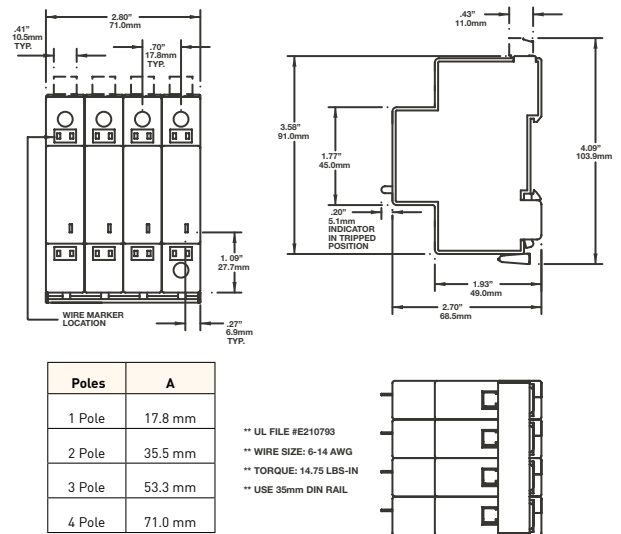
Surge-Trap Circuit Connection Wiring Diagrams



Surge-Trap Pluggable Dimensional Diagrams

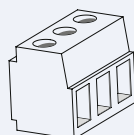


Surge-Trap Modular Dimensional Diagrams



Surge-Trap Microswitch Diagram

One microswitch per system



NO 1
 NC 2
 Common 3

Subminiature Switch
 125 VAC-3A max
 -25° C to 85° C

Signal Wire Range: #16 to #30 AWG
 Terminal Torque: 1.8lb-in

One microswitch per pole



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