

TPMOV[®]
TECHNOLOGY
By Ferraz Shawmut



Surge-Trap[®] Surge Protective Device

*The no-fuse
surge suppressor*



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

Choose Your Industry



Agriculture



Medical



Solar Power



Telecommunications



Water Treatment



Wind Power



Transportation

Surge-Trap® offers a patented high performance thermal overload technology that allows for higher safety ratings and protection.

Reduce the Costly Impact of Transient Damage

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.

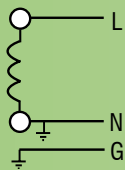
- Destructive – Associated with high level energy surges, resulting in immediate equipment failure (most obvious)

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 of its kind to feature a patented, thermally protected metal oxide varistor (TPMOV®) technology, eliminating the need for additional overcurrent protection.

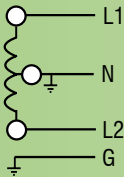
To evaluate the safety performance of an SPD, look for compliance with UL 1449 Third Edition, RoHS compliant, IEC 61643, and ANSI/IEEE C62.41.



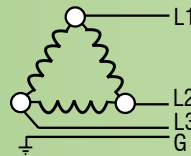
Choose Your Voltage Configuration



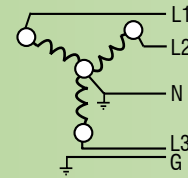
Single Phase
2 Wire + Ground



Split Phase
3 Wire + Ground



3 Phase Delta
3 Wire + Ground



3 Phase Wye
4 Wire + Ground

Industries

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



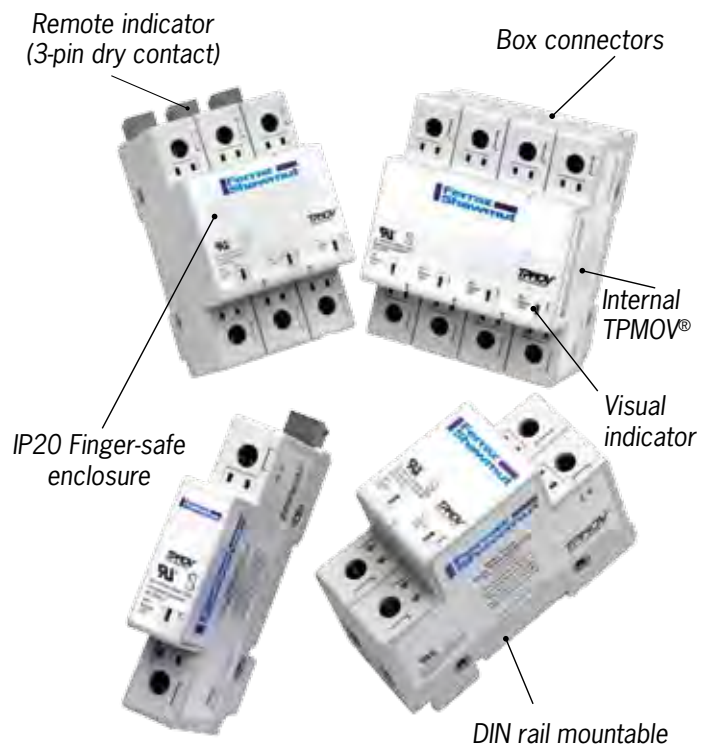
Applications

- 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



Surge-Trap® Product Highlights

- Easy installation or retrofit
- Din-rail mountable
- Fail-safe /self-protected design
- Remote indicator (optional) with 3 pin NO/
NC contact
- IP20 finger-safe design
- Visual indicator
- Small foot print





Choose Your Product

| ST | 480 | 3PY | G | M |
|-------------|--|--|---|---|
| Surge-Trap® | System Voltage 120 - 120V 208 - 208V 230 - 230V 240 - 240V 277 - 277V 480 - 480V 600 - 600V | Voltage Configuration 1P - Single Phase SP - Split Phase 3PD - 3 Phase Delta 3PY - 3 Phase Wye | N/G Blank - Includes N/G Mode G - L-G Mode Only | Auxiliary Microswitch Blank - No Microswitch M - Microswitch Included |

Approvals/Standards

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

Ratings

- 100kA SCCR
- 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-8/20 μ s: 1000 events
- Operating and storage temperature: -40°C to +85°C
- Wiring range: #6 to #14 AWG



Surge-Trap applied in an electrical panel.

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 $1.25 \times (t_{90} - t_{10})$.

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 (I_n): 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 (VPR):** 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.

How to Select and Order Surge-Trap®

Ordering Information

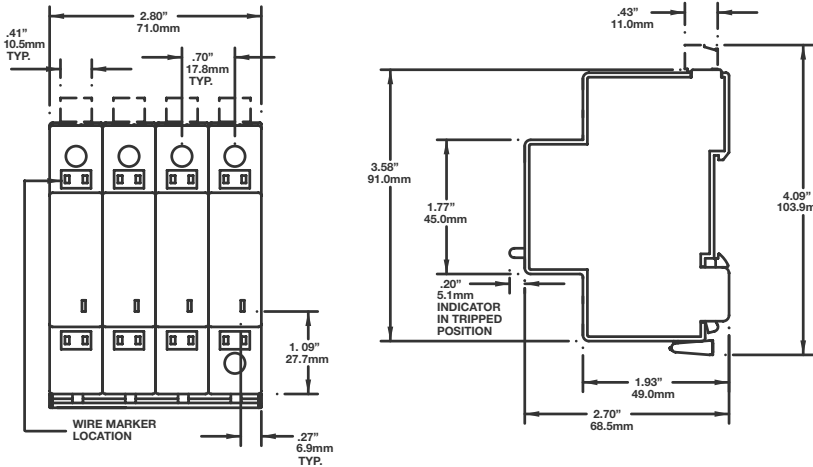
| Surge-Trap® Catalog Nos. | Nominal Voltage (Vac) | MCOV (L-G) | Phase | No. of Wires | Freq (Hz) | Nominal Discharge Current (In, kA) | SCCR (kA) | Circuit Connection Diagram | Intended End-Use SPD Type | Voltage Protection Rating (VPR) | | | |
|-----------------------------|--------------------------|------------|-------|--------------|-----------|--|-----------|----------------------------------|---------------------------------|---------------------------------|------|------|------|
| | | | | | | | | | | L-N | L-G | N-G | L-L |
| ST1201PG | 120 | 180 | 1 | 2 Wire | 50/60 | 20 | 100 | A | 2 | 600 | 600 | - | - |
| ST2301PG | 240 | 270 | 1 | 2 Wire | 50/60 | 20 | 100 | A | 2 | 800 | 800 | - | - |
| ST2771PG | 277 | 320 | 1 | 2 Wire | 50/60 | 20 | 100 | A | 2 | 1200 | 1200 | - | - |
| ST2083PY | 120/208 | 360 | 3Y | 5 Wire | 50/60 | 20 | 100 | D | 2 | 1000 | 600 | 600 | 1000 |
| ST2083PYG | 120/208 | 180 | 3Y | 4 Wire | 50/60 | 20 | 100 | C | 2 | 500 | 500 | | 900 |
| ST208SPG | 120/240 | 180 | S | 3 Wire | 50/60 | 20 | 100 | B | 2 | 600 | 600 | | 1000 |
| ST240SPG | 120/240 | 180 | S | 3 Wire | 50/60 | 20 | 100 | B | 2 | 500 | 500 | | 900 |
| ST480SPG | 240/480 | 270 | S | 3 Wire | 50/60 | 20 | 100 | B | 2 | 800 | 800 | - | 1500 |
| ST2403PDG | 240D | 270 | 3D | 4 Wire | 50/60 | 20 | 100 | C | 2 | 800 | 800 | - | 1500 |
| ST4803PY | 277/480 | 500 | 3Y | 5 Wire | 50/60 | 20 | 100 | D | 2 | 2000 | 1200 | 1200 | 2000 |
| ST4803PYG | 277/480 | 320 | 3Y | 4 Wire | 50/60 | 20 | 100 | C | 2 | 900 | 900 | - | 1800 |
| ST4803PDG | 347/600 | 550 | 3D | 4 Wire | 50/60 | 20 | 100 | C | 2 | 1500 | 1500 | | 3000 |
| ST6003PY | 347/600 | 690 | 3Y | 5 Wire | 50/60 | 20 | 100 | D | 2 | 2500 | 1500 | 1500 | 2500 |
| ST6003PYG | 347/600 | 420 | 3Y | 4 Wire | 50/60 | 20 | 100 | C | 2 | 1200 | 1200 | | 2000 |

Phase Key: (S) Split Phase (Y) Wye (D) Delta (See top of page 2)

*Values based upon SPD Type 2 testing

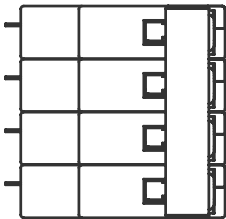


Surge-Trap® Dimensional Diagram

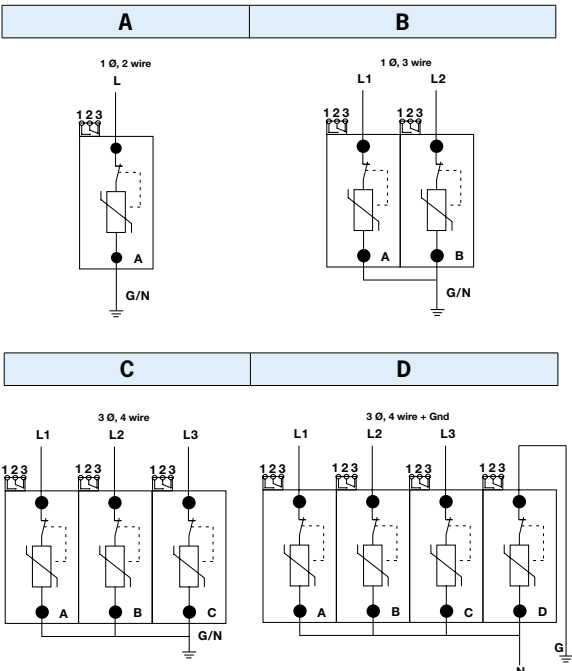


| Poles | A |
|--------|---------|
| 1 Pole | 17.8 mm |
| 2 Pole | 35.5 mm |
| 3 Pole | 53.3 mm |
| 4 Pole | 71.0 mm |

** UL FILE #E210793
** WIRE SIZE: 6-14 AWG
** TORQUE: 14.75 LBS-IN
** USE 35mm DIN RAIL



Surge-Trap® Circuit Connection Wiring Diagram

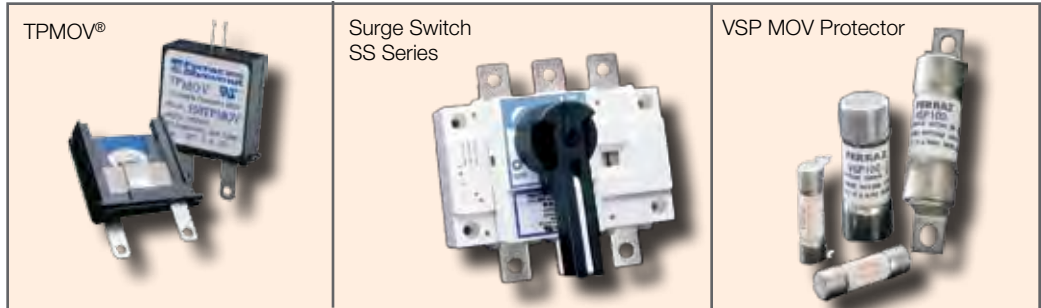


A relentless pursuit of protection for electrical components, systems - and the people who use them.

Ferraz Shawmut is an international company manufacturing the widest range of circuit protection solutions in the electrical industry. Drawing on a century of experience - and an ongoing commitment to critical research in electrical safety - we provide industrial, commercial, and OEM customers with innovative products and technical support teams to increase effectiveness, simplify applications, and enhance productivity. Learn more about our circuit protection solutions at us.ferrazshawmut.com.

Other Surge Protection Products from Ferraz Shawmut:

A wide range of surge protection products are available including:



For more on Surge-Trap® visit:
us.ferrazshawmut.com.

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BR-ST-002/2500/10.08/STASSOC

WEB UPDATE 1/5/09