



# Low-Voltage Surge Protection

## Quick Reference Fact Sheet

HSB, a Munich Re company, is a technology-driven company built on a foundation of specialty insurance, engineering and technology, all working together to drive innovation in a modern world.

Electrical surges, or transients, are a leading cause of equipment failure. Surges can come from the outside (lightning, utility operations) or from within a facility. It is critical that a facility has a good, low-resistance grounding system to protect against surges.

**Employ a “Zones of Protection” approach for maximum protection against electrical surges.**

**Zone 1:** Install a surge protection device (SPD), (previously known as a transient voltage surge suppresser or TVSS) on the electrical service entrance equipment to protect against surges generated from outside the facility.

**Zone 2:** Install SPDs at each distribution panel supplying critical or sensitive electronic equipment. This will provide protection against internally generated surges.

**Zone 3:** Install SPDs at the point-of-use of sensitive equipment.

### Application

– (Type 1, 2, or 3) Service entrance, distribution panel, or for point-of-use equipment protection.

– Data Line Protection — SPDs should be installed on all systems susceptible to electrical transients, including phone/fax lines, cable or satellite systems, and local area networks (LAN).

### Understand the technical ratings of SPDs.

- **System Voltage**  
120V, 240V, 480V, etc.
- **System Configuration**  
Single or three phase, delta or wye connection, etc.
- **Voltage Protection Rating**  
(UL 1449- 4th edition) The maximum rated surge voltage value that will be allowed to pass through the circuit to the protected load device. Also known as “let-through voltage.”
- **Nominal Discharge Current**  
The peak value of 8/20  $\mu$ s current that can safely pass through the SPD after 15 surges and still remain functional.
- **Short-Circuit Current Rating**  
The maximum short circuit current that the SPD (and its fuse or circuit breaker) can withstand without causing damage and still safely disconnecting from the power source.
- **Standards Tested to UL 1449-4th edition, and IEEE Std C62.45**



### Installation

- SPDs should be installed in accordance with NEC article 285, and as close to the equipment being protected as possible.
- The surge protectors should be equipped with “working/failed” indicators.
- Cable lengths should be short and straight.
- A solid connection to the system grounding conductor is essential.
- Use a professional engineer experienced with surge suppression technology for design and coordination of the protection scheme.
- Use a licensed electrician for installation of SPDs on service entrance and distribution equipment.

For more detailed information, please refer to HSB’s Guideline for Providing Surge Protection and our three part series addressing Power Quality of Commercial Buildings at HSB.com.