



## QUICK REFERENCE FACT SHEET FOR LOW-VOLTAGE SURGE PROTECTION

The following is a quick reference fact sheet for surge protection of low-voltage electrical distribution systems. For more detailed information, please refer to HSB's Guideline for Providing Surge Protection at Commercial, Institutional, and Industrial Facilities.

- 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 have 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), also known as a transient voltage surge suppresser (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 locally at each piece of equipment requiring protection.
- Understand the technical ratings of SPDs:
  - System Voltage - 120 V, 240 V, 480 V, etc.
  - Circuit Configuration - Single or Three phase, Delta or Wye connection, etc.
  - Clamping Voltage - Voltage exposed to protected equipment; generally, the lower the better
  - Surge Current - Amount of current the SPD can safely divert to ground
  - Application - Service Entrance, Distribution panel, or for local equipment use
  - Standards - Tested to UL 1449 and ANSI/IEEE C62.41
- 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).
- Installation:
  - SPDs should be installed as close to the equipment being protected as possible.
  - Cable lengths should be short and straight
  - A solid connection to the system grounding conductor is essential
  - The surge protectors should be equipped with operation indicators
- 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 panels.