

Loss Control Bulletin

*A Policy of Working Together
for a Safer Tomorrow*

Surge Protection Devices (SPDs)

Lightning is perhaps one of the least understood phenomena in nature. Insurance industry results indicate lightning is responsible for an estimated \$5 billion in damages to property every year. Power surges from a variety of sources can do similar damage. These lightning strikes and power surges can reach tens of thousands of volts and happen in milliseconds. While lightning and power surges cannot be eliminated, some things can be done to protect against the damage caused by them.

Everyone is aware of the damage lightning can do to a building when it has a direct hit. There will be physical damage to the building and a high likelihood of fire. But many times there will also be damage to the buildings electrical system and the electronic equipment located inside the building. With so much sensitive electronic equipment in every home and workplace today, it is imperative that precautions be taken to protect the electrical system and electronic equipment. Financial losses could include repair or replacement of the system or equipment, lost productivity and down time and other losses (loss of valuable data, etc.).

A direct hit or even near-miss on a nearby power line can result in surge currents being induced onto the utility lines. These surges will enter the electrical system via the buildings electrical service conductors. The same goes for a stray power surge that may find its way onto the electrical grid. The surge currents travel along the power line searching for a ground. Once the surge current enters a buildings electrical system, there is a good chance that damage will be done to the electrical system or equipment within that building.

Device types

Surge protection devices (SPDs) are designed to limit the damage caused by surges on the devices they are designed to protect by bypassing or discharging the surge current to a safe level. There are four types of SPDs, Type 1, 2, 3 and 4.

A Type 1 SPD is called a surge arrester. It is designed to be installed on the line side of the service entrance main and be 1000 volts or less.

These devices are typically installed by the local utility company.



A Type 2 SPD is called a transient voltage surge suppressor (TVSS). A TVSS must be installed on the load side of the service entrance main and be 600 volts or less. Type 2 devices should be installed by a licensed electrician according to the manufacturer's guidelines.

A Type 3 SPD is a cord-connected, direct plug-in, receptacle type that is used to protect a particular piece or pieces of equipment (i.e. – computer, printer and monitor plugged into one SPD receptacle). These must be installed a minimum conductor length of 30 feet from the electrical service panel. A Type 3 (plug-in) device should be used as a secondary means of protection for electronic equipment. A Type 1 or 2 device should still be installed as the primary means of protection.



A Type 4 SPD is actually installed on the electrical component as protection.

SPDs should be UL 1449 listed or recognized by another Nationally Recognized Testing Laboratory (NRTL). Devices that are not UL-listed or approved by a NRTL should not be installed as they may create a potential fire hazard. Type 2 devices should be installed by a licensed electrician according to the manufacturer's guidelines. The SPDs should have a visual indicator, such as a light, that will indicate that the device is operational. Some devices are a one-time use only. Once they bypass or discharge a surge, they are no longer operational and must be replaced. Other heavier-duty devices will reset themselves after a surge.

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