

UPS vs. surge suppressor

Customers often ask us to explain the difference between a surge protector and an UPS — and which device is better suited for their environment.

The fact is that neither UPS nor surge protection devices (SPD) alone will provide complete protection for commercial systems. The most effective installation is ensured by utilizing a combination of both forms of power conditioning.

Surge protectors (or suppressors) provide just that: a line of defense against surges, which are short-term high voltages above 110 percent of nominal. They are often associated with lightning strikes and utility switching, but in fact 80 percent of surges originate inside a facility. These occur due to electrical switching or other disturbances created by various devices within the building. Regardless of the source, the increased voltage from surges can damage the components of electrical systems such as computers, networks, and process control equipment.

Even if nothing is immediately destroyed, over time the increased strain can cause premature failure of expensive components. It's important to note that surge protection will not keep your equipment operational during a blackout, but damaging surges occur much more frequently than power outages. A properly designed backup power system should always incorporate a cascaded approach to applying surge protection (i.e. a two layered approach) working in conjunction with a UPS. The first surge unit, (upstream SPD) mitigates the brunt of the surge energy while the second unit (the UPS) reduces any remaining surge energy to an inconsequential level.

A UPS delivers second-level protection against surges; it should never be considered a primary surge protection device. It also continually regulates incoming voltage and provides an internal battery that allows connected equipment to continue running even if the power supply is cut. In order for your electronic devices to continue to function even if power is unavailable, you need a UPS, and often a backup generator.

So how do you apply these devices coherently? Surge protection should be installed on the utility side of your UPS, ideally on the bypass line. This provides the following modes of protection:

- Greatly extends the life of the surge protection components in your UPS
- Provides surge protection for your load when the UPS is off line for maintenance

Surge protection installed on the utility side of a UPS will also help protect the UPS. A dramatic surge event, such as a lightning strike can be associated with over 20 kV and 5 kA. The typical let through voltage of a surge device (UPS included) when subjected to this level of surge event would be roughly 2000V, which is still high enough to cause equipment damage. To eliminate this we install an upstream unit and allow the UPS to mitigate the effects of the remaining surge energy, i.e. driving the final let through voltage down to around 200V which is well below the point that would cause damage.

Additionally, it may be wise to install an SPD between the UPS output and the load distribution system. This is especially true if the load panel is located a long distance from the UPS. The more distance, the better likelihood that an internally generated surge could impact the load.

So which form of power protection is best suited for your environment? The answer is, both. Critical servers, workstations, PCs, POS and VoIP equipment, and other key business devices are protected by attaching a UPS, ensuring they are able to function in the event of a power outage and, if needed, shut down cleanly if power remains out for an extended period of time. Surge devices are required as well, to protect both critical equipment, and even the UPS itself.



Eaton Eclipse surge suppressors