



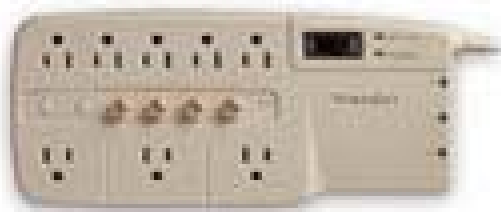
## [Outlet Strip Voltage Surge Protection Devices](#)

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Proper selection of the correct Surge Protection Device (SPD) is critical. Many facilities rely on only one type of protection, either a SPD at the main circuit breaker (fuse) box only or individual outlet strip surge voltage protectors at specific equipment only. Using one type of protection is better than nothing; however, to fully protect your equipment, all three areas as specified by IEEE categories A, B, and C must be protected. These three categories include the main service entrance, sub distribution panels, and individual equipment.

As always when we make recommendations we try and use third party standards. The concept of protectors in multiple areas within your facility is not a fancy idea of the SPD manufacturers to sell more units. It is a REQUIRED method as spelled out by the IEEE 1100 8.6.4 (Institute of Electrical and Electronics Engineers). By not adhering to the above standard, proper protection of your facilities equipment cannot be met.

With this in mind I would like to spend some time talking about Outlet Strip Voltage Surge Protection Devices. The following picture shows a common outlet strip voltage surge protection device:





The most important features of an outlet strip voltage surge protection device include the following:

- Short Circuit Protection**
- Correct Wiring Indicator**
- Proper functioning Indicator**
- Voltage Protection**
- Phone Protection**
- Cable Protection**
- UL 1449 2<sup>nd</sup> edition listing**
- Large Maximum transient current rating**
- Low Voltage let through rating**

Every one of the above mentioned features are important. If your outlet strip voltage surge protection device does not have or meet these requirements you may have diminished protection of your facility's equipment.

Let's look at each of the features:

**Short Circuit Protection.** Your unit should be equipped with a fuse or circuit breaker so that if a problem occurs in which the unit needs to be disconnected before it "burns up," it will do so before causing damage to your facility. A circuit breaker is preferable so that you do not have to keep extra fuses on hand.

**Correct Wiring Indicator.** All surge protection devices must be wired properly. Outlet strip units are no exception. Of course the unit itself should be wired properly or it shouldn't have passed factory inspection before shipping, but the outlet which the unit plugs into must also be wired properly. Many people assume the outlets in their facility are wired correctly; however, it has been my experience that many are not wired properly. Your outlet strip voltage surge protector should have an indicator on it to show if the outlet you are plugging into is wired properly.

**Proper functioning Indicator.** Your unit should have an indicator showing that is working properly and supplying protection to the equipment plugged into it. All SPD units have a maximum surge capability they can withstand. Your unit should be able to protect the equipment plugged into it when hit by frequent surges; however, a large surge in excess of the unit's capability may occur. The unit **MUST** be able to give you an indication that it has received one of these



large surges and is no longer functioning to its intended capability. Absence of this indicator leaves you in doubt as to whether the unit is still working properly or not.

**Voltage Protection, Phone Protection, Cable Protection.** Voltage surges enter your facility from many sources. The three most common are: 1) the voltage wiring in your walls, floors, and ceiling, 2) the phone lines, and 3) any cable TV or internet access cables. Many people concentrate on the voltage wiring for surge protection; however, surges can and do enter your facility on the phone lines and the cable lines. To fully protect your facility you must have SPD protection on all three of the above. Once again, this is not only the SPD manufacturer's recommendation, it is a requirement of IEEE 1100 8.6.6. Your outlet strip voltage surge protection device should have connections for not only voltage but phone lines and cable.

**UL 1449 2<sup>nd</sup> edition listing.** For your unit to be considered an outlet strip voltage surge protector by UL (Underwriters Laboratory), it must be labeled with the UL number UL 1449 2<sup>nd</sup> edition. Many outlet strips are on the market with a label on the package or box that says it is a "Protector", but do not have the UL 1449 2<sup>nd</sup> edition label. Any unit that does not have the UL 1449 2<sup>nd</sup> edition label may not be a SPD unit at all. It may be just a short circuit protector only, not a Surge Protection Device.

**Large Maximum transient current rating, Low Voltage let through rating.** These two ratings are the meat of the SPD unit ratings. Most SPD manufactures have to show some type of visual indication of how well their unit performs. The most popular visual indicator you will see on outlet strip voltage surge protection device is something called a Joule. A Joule is the measurement of watts per second. The Watt a measurement of electrical power and of course the Second is a measurement of time. So, if we use the Joule as a measurement of performance with a TVSS unit we are looking at Power (Watts) over Time (Seconds). The relationship between Joules, Watts, and Seconds is as follows:

$$1 \text{ Joule} = 1 \text{ Watt of power in 1 Second}$$

Or,

$$1 \text{ Watt} \times 1 \text{ Second} = 1 \text{ Joule}$$



So let's say we have a SPD unit that is labeled that it can withstand 2000 Joules. This **COULD** mean it can withstand:

2000 Watts x 1 Second = 2000 Joules - meaning it can take 2000 Watts of surges for 1 second.

This may sound good. However IEEE tells us transient surges can last only fractions of a second and can exceed 18,000,000 watts.

However, by just using Joules for measurement of performance it could also mean the following:

1 Watt x 2000 Seconds = 2000 Joules - meaning it can only withstand 1 Watt of surges for 2000 Seconds (33 minutes). Is this good? NO. Can it survive 2 watts for any amount of time? How much voltage will it let through to damage your equipment? **Once again we don't know.** There is no IEEE standard for Joules, therefore, we must use a **common** standard when comparing SPD units. What is the standard? Once again, IEEE. IEEE does have standards for current ratings and voltage let through ratings. The current ratings let us know how many amps the unit can withstand during a surge and keep on working. The voltage let-through ratings show us how much voltage is passed through to our equipment when a certain amount of current is applied. These current and voltage numbers are determined by IEEE and the only recognized standard for comparison by the IEEE.

### **Conclusion**

When making a decision to protect your facilities equipment from the damaging effects of transient voltage surges, you should take the recommendations of the IEEE and install multiple levels of protection so that all your equipment is covered. Also, when making buying decisions you should compare the IEEE standards of each SPD unit, not some flashy marketing ploy. We can help you compare the specification sheets of different SPD manufacturers and help you make the right SPD decision.