



SPD Industry Updates

UL 1449 4th Edition, Effective 3-11-2017*

UL 1449 3rd Edition, Effective 9-29-2009* (Changes listed herein are an abridged version of ANSI/UL 1449 Ed. 3 Standard)

NEC 2017, Broadens Requirements for Surge Protection Devices to include Emergency Systems, Business Continuity, Public Safety, Critical Operations and Industrial Equipment

Updates to **UL 1449 4th Edition** pertain to Type 4 SPD's- which are SPD's that are a component of other equipment. An example might be an SPD internal to a control cabinet.

There were many updates to **UL 1449 within the 3rd Edition updates**, as follows;

- ✓ Terminology changed from TVSS to **SPD** for a panel type Surge Protector.
- ✓ SPD's are designated and marked on the product by UL as **Type 1, 2, 3 or 4**
 - Type 1, *aka: Secondary Surge Arrestors* – Permanently connected and located between the secondary-side of the service transformer at the primary side of the service entrance disconnect.
 - Type 2, permanently connected and located on the secondary side of the main service disconnect
 - Type 3, Cord connected and located at the point of utilization. SPD's connected at 30 feet or less
 - Type 4, Component or assembly devices
- ✓ **VPR** (Voltage Protection Rating) is the new terminology for what previously may have been referred to as clamping voltage. The VPR is used to determine the level of protection an SPD can provide. The VPR is the voltage level at which the SPD turns on to divert transient events. SPD's are tested to the IEEE waveform consisting of an open circuit voltage and a short circuit current.
The open circuit voltage of the 1.2/50µs waveform is 6kV and the amplitude of the 8/20µs short circuit current is 3kA. All measurements for parallel SPD's are measured let-through at a distance of 6" from the exit of the conductors from the enclosure. Once the SPD's VPR is determined, the SPD undergoes a nominal discharge current test. The VPR is part of the UL marking requirements on the SPD. This is a change from the previous UL 1449/IEEE waveform of 6kV/500A, thus increasing the SPD's VPR due to the test method change.
- ✓ **Nominal Discharge Current Test (aka: "In" test)** was adopted from the IEC standards for SPD's. It is part of the VPR test and is a measure of the SPD's endurance capabilities. The In test is only applicable to Type 1 and Type 2 rated devices and the manufacturer chooses the "In" value. Type 1 rated devices are either 10kA or 20kA. Type 2 devices choose 3kA, 5kA, 10kA or 20kA. The test consists of 3 groups of 5 impulses for a total of 15 impulses. At the completion of the "In" test, the SPD is subjected to the MCOV applied for 15 minutes. The VPR is verified by applying the IEEE waveform and measuring the let-through voltage. The "In" value is part of the UL marking requirements on the SPD.
- ✓ **Fault Testing** is a test carried over from UL 1449 2nd Edition. This requires all manufacturers to have a fault current rating (AIC) on their SPD's. This is in compliance to NEC 285.6. SPDs must have the same or greater AIC/fault rating as the equipment or panel that they will be installed on.
- ✓ **MCOV** of all SPD's must be a minimum of 115% of the nominal voltage. This is verified after the "In" testing by subjecting the device with a 115% MCOV applied for 30 minutes.
- ✓ Under 3rd Edition, **Lightning Protection System Master Labeling (UL 96A)**. To qualify for LPS master labeling, SPD's must be installed at each service entrance location and must be either Type 1 or Type 2 listed. SPDs must also have an "In" rating of 20kA. For updates you may want to check with LPI in your area.
*For a product placement/application guide please visit www.powerquality.net

National Electric Code 2017, as of July 1, 2017 ten states have completed its 2017 NEC adoption process. Sixteen of the states are in the process of updating the statute or administrative rule through which the NEC is adopted to reference the 2017 edition. Please visit the www.nfpa.org/NEC/NEC-adoption-and-use/NEC-adoption-maps to view your states status.