

UL 1449 Third Edition: SPD/TVSS Changes Effective September 29, 2009

UL 1449 has undergone extensive revision as surge suppression's standard for safety. UL 1449 Third Edition, defines performance testing and nomenclature, which effectively reboots the surge industry. UL 1449's performance testing provides a way to compare newly evaluated Surge Protective Devices (SPDs), formerly known as Transient Voltage Surge Suppressors (TVSS). These changes became effective September 29, 2009, which predictably impacts specifiers and the supply chain as follows:

- New performance tests use more surge current, making let-through voltages increase
- New test results are numerically higher, thus not meeting old-style specifications
- Electrical & General Contractors and Distributors might waste time trying to source SPDs that cannot meet an out-dated specification
- In frustration, Old/Obsolete TVSS may be submitted, which may or may not be UL Listed, or supported in the future
- Specifying Engineers might waste time evaluating submittals
- Specifying Engineers may not be getting what they want, or what they think they're getting
- **Please revise SPD specifications**

Terminology Shift and Inclusion of Surge Arresters:

The term Transient Voltage Surge Suppressor (TVSS) is replaced by Surge Protective Device (SPD). This nomenclature change coincides with NEC and International standards' terminology. SPD is a more general description and pulls old-style secondary surge arresters (SSAs) under UL's SPD performance and safety standard. Type 1 SPDs replace almost every secondary arrester on the market effectively obsolescing them.

Let-through Voltage Test Change:

Old 2nd Edition tests used 500A, 6,000V. New 3rd Edition tests use 3,000A, 6,000V, i.e. 6 times more surge current. The VPR for an SPD will be higher than the SVR of an identical SPD. Higher current levels equal higher let-through voltages.

| Standards | UL 1449 2 nd Edition | UL 1449 3 rd Edition |
|-----------|---------------------------------|---------------------------------|
| Test | Suppressed Voltage Rating | Voltage Protection Rating |
| Title | SVR | VPR |
| Reference | 0.5kA/6kV | 3kA/6kV |

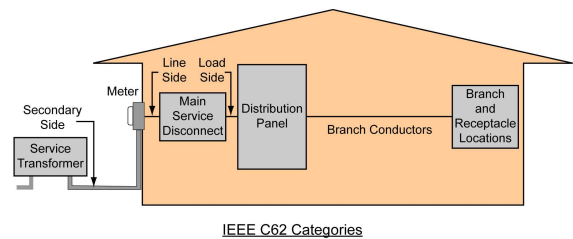
The change from SVR to VPR is probably the single most important change in UL 1449 3rd Edition relating to specifiers. The SVR listed in current specifications will be obsolete. Comparing a VPR rating to a SVR rating would provide no information of value. In order to make accurate performance comparisons, the VPR of one device must be compared with the VPR of another device.

UL96A Lightning Protection Master Label Impact:

Previously, UL 96A required surge suppressors evaluated as secondary arresters. There were issues associated with different regulation and administration. Secondary arresters now evolve into Type 1 SPDs, and UL 96A will accept Type 1 or Type 2 SPDs having 20kA I_n ratings (new rating, explanation follows).

Type Designations:

UL 1449 3rd Edition assigns type designations to SPDs (1, 2, 3, 4) based on the installation location within the electrical distribution system.



Category A – Branch and receptacle locations

Category B – Load side of the main overcurrent protection device to distribution panels

Category C – Secondary side of the service transformer drop to the line side of the main overcurrent protection device. This is a critical location to apply surge protection in order to **stop external surges before they get in**.

Type 1 – Installed on line or load side of the Main Overcurrent Protection (OCP), similar to what you knew as SSA, except now includes rigorous safety testing. Includes all OCP & safety disconnectors inside the SPD

Type 2 – Installed on load side of the Main OCP, similar to what you know as hardwired TVSS, and it may require external OCP.

Type 3 – Point of Utilization, direct plug in type devices, similar to what you know as surge strips. These devices are intended for installation 10 meters from the panel (rational based on IEEE Cat. A location).

Type 4 – Surge suppression components, could be a basic component or a complete module. Type 4 components can be tested for Type 1, Type 2 or Type 3 applications.

Nominal Discharge Current Test (I_n):

The I_n test is new to UL 1449. It originates from IEC style testing whereby a SPD must remain functional after being subjected to 15 repetitive impulses of a specific value. Every mode of protection is tested, including any required overcurrent protection. Between impulses, the SPD is energized at MCOV. The test format tends to cause heat accumulation, which makes this much more difficult than face value suggests. Type 1's are to be tested at 10kA or 20kA, Type 2's to 3kA, 5kA, 10kA, or 20kA.

The testing is performed in conjunction with VPR tests.

Conclusion:

Understanding the major revisions in UL 1449 3rd Edition is important for specifiers as this revision will render your 2nd Edition specifications obsolete. New 3rd Edition products will not meet old style specs, wasting time and money. You can download Siemens TPS3 guide specifications at

www.usa.siemens.com/spd

For further information or clarification, please contact Siemens "Speedfax" Hotline at 1-888-333-3545

www.usa.siemens.com/spd

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