Lowell™
Distributed Audio, Power & Rack Solutions

Surge Suppression

Understanding "A-1-1"

In 1996 the General Services Administration of the United States government issued a document entitled *"Commercial Item Description: Surge Suppressor, Transient Voltage (120 Volt 60 Hertz, Single Phase, 15 Ampere) Direct Plug-in and Cord-connected Types"*. (GSA Document Number A-A-55818). This document was intended to be used as a guide for all federal agencies in their procurement of commercially available "surge suppressors". Therefore, if you were a purchasing agent for a government agency, you could pick features from the lists below and create a specification for a surge suppressor.

There are five different areas of interest spelled out in this document:

1. TYPE: There are four "types" specified.

Type I — Cord connected
Type II — Cord connected with telephone/fax protection provided
Type III — Direct plug-in (no cord, attaches directly to wall outlet)
Type IV — Direct plug-in with telephone/fax protection provided

The "type" classification is self-explanatory.

2. CLASS: There are three classes specified.

Class 1 — 330 volt Suppressed Voltage Rating
Class 2 — 400 volt Suppressed Voltage Rating
Class 3 — 500 volt Suppressed Voltage Rating

Interestingly, this is taken directly from the Underwriter's Laboratories standard for transient voltage surge suppressors UL1449 2nd Edition (page 96 par. 60.1). The 330-volt rating is the lowest rating allowed by UL, regardless of how low the suppressed voltage performance of the unit may actually be. (Incidentally, the UL1449 2nd Edition standard has been superseded with editions that mandate different ratings. As of this writing, the standard is UL1449 4th edition.)

3. MODE: There are two “modes”.

Mode 1 — Normal mode, defined as suppression between the line (hot) and neutral only.
Mode 2 — All modes (line to neutral, line to ground, and neutral to ground suppression)

There are opposing schools of thought on this issue. Conventional logic would seem to imply that “all modes” protection would be best; however, there are many applications, especially in audio/video and communications systems, where “normal mode” is most appropriate. With “normal mode” configurations there is less chance of introducing unwanted noise signals to the building grounding circuits which can disrupt sensitive IT and DSP functions.

4. SIZE: This refers to the number of receptacles provided on the unit. There are five “sizes” indicated.

Size 1 — 1 receptacle
Size 2 — 2 or 3 receptacles
Size 3 — 4 or 5 receptacles
Size 4 — 6 or 7 receptacles
Size 5 — 8 receptacles

5. GRADE: The “grade” has to do with the endurance test data provided by the manufacturer of the device. All approved units must be capable of enduring 1000 surges (8/20 micro-second waveform per ANSI standard).

The “grade” refers to the voltage and current level of the test surges.

Grade A — 6000 volts, 3000 amperes
Grade B — 4000 volts, 2000 amperes
Grade C — 2000 volts, 1000 amperes

Obviously, a Grade A rating would indicate the most robust unit. (Most utility provided electrical service equipment is designed to stop any voltage surge levels over 6000 volts, so 6000 volts is the highest surge level that would be expected inside of a building.)

Withstanding 1000 surges as described above is NOT a requirement to obtain an NRTL listing under UL standard 1449. The standard only requires that the unit endure fifteen (15) such surges.

Underwriters Laboratories does offer the 1000 surge test to anyone who is interested, but it is *not*, and never was, part of any testing program required to obtain a "listing" from Underwriters Laboratories, Intertek Testing Services (ETL), or any other OSHA approved Nationally Recognized Testing Laboratory (NRTL).

To assure the best performance of our Advanced Surge Protection models, Lowell Manufacturing chose to have that test done even though it is not required. We passed.

Sometimes a focus is placed on the "class", "mode" and "grade" sections from the GSA document referenced above, and the designations are rearranged as "A-1-1". This should not be taken to imply the highest rating of government approval. "A-1-1" has no such meaning.

Incidentally, GSA Document A-A-55818 was withdrawn and cancelled on 2-26-02.