

Third Edition: Voltage Protection Ratings (VPR) Why the Change?

In our last newsletter article on Third Edition, we took a closer look at Nominal Discharge Current Ratings. This time, we are going to focus on the Voltage Protection Rating (VPR).

Some of you are familiar with UL 1449 Second Edition, as well as the surge protection products currently offered by many manufacturers. The ratings on the UL product label include the Suppressed Voltage Ratings (SVR). These ratings are based on the 6 kV/500 A combination waveform.

During the development of UL 1449 Third Edition, several factors were considered prior to making the change to Voltage Protection Ratings. These included the primary reference to permanently connected devices as well as the impact of the new Nominal Discharge Current Test.

In the Second Edition, the measured limiting voltage test, using the 6 kV/500 A combination waveform, was applied before the Duty Cycle test, which was conducted using twenty pulses of the 6 kV/3 kA combination wave. After the Duty Cycle test, a second 6 kV/500 A combination waveform was applied. If the measured limiting voltage result from the second test was not more than 10% different from the first measured limiting voltage result, the final result was used to determine the Suppressed Voltage Rating.

The same basic principle applies to the Third Edition. However, in the Third Edition, the Voltage Protection Rating is based on the 6 kV/3 kA combination waveform and, for permanently connected devices (Type 1 and Type 2, typically) the duty cycle test is replaced by the Nominal Discharge Current Test discussed in the previous article. For Type 3 devices (cord connected and plug in devices) the Voltage Protection Rating is the same (6 kV/3 kA) and the duty cycle test using the same waveform is conducted.

The higher measured limiting voltage test (6 kV/3 kA as opposed to the Second Edition 6 kV/500 A combination waveform) and the change from the Duty Cycle Test to the significantly more stressful Nominal Discharge Current (I_n) test are designed to provide the end-user with a much higher level of confidence in the safety of the SPD. This is particularly true in the event of a catastrophic surge such as lightning.

When looking at the ratings on the Third Edition listed SPD compared to the previous Second Edition listed SPD, what is generally found is that the Voltage Protection Ratings are higher than the previous Suppressed Voltage Ratings. This makes perfect sense due to the difference in test waveforms.