Remora Electrical

Surge Protection?

Surges or Transient overvoltages are increases in voltage lasting only thousandths or millionths of a second but could reach thousands of volts measured between two or more conductors. These potentially destructive voltages can be induced into a building from various sources, from direct and or secondary effects of lightning, through the switching of large inductive or capacitive loads, or equipment faults. All of which resulting in degradation of equipment components and circuitry, shortening of equipment lifetimes and increasing failures, causing costly and unnecessary system downtime.

To ensure continuous operation of critical systems, even in the event of a direct lightning strike SPD's are an essential component and should have a low let-through voltage, as this is the value that the protected equipment will be subject to. The lower the let-through voltage the better the protection.

Common Terminology and Definitions

Maximum Continuous Operating Voltage Uc:
Is the maximum RMS voltage that may be continuously applied to the terminals of the SPD

Impulse Discharge Current (for Type 1; Test Class I); Iimp:
A current peak with a charge and a specific energy (often represented by 10/350us waveform) that a Type 1; Test Class 1 device must survive during a type test.

Maximum Discharge Current; Imax:
The maximum current (8/20us waveform) that a Type 2; Test Class II protective device will withstand.

Nominal Discharge Current (for Type 2; Test Class II); In:
This is a defined nominal peak current through the SPD with an 8/20us waveform. This is used for classification of the mains SPDs (Class II test) and also for preconditioning of SPDs in Class I and Class II tests.

Voltage Protection Level / Let Through Voltage (up):
This is the key parameter that characterises the performance of the SPD in limiting the transient overvoltage across its terminals. It is the maximum voltage that the protected equipment will see if it was positioned directly at the terminals. Up is measured at Iimp for Type 1 and In for Type 2 devices.

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Surge Protective Device Types Explained

Type 1:
Generally, if there is a risk of direct and proximity lightning strikes to the building or to an overhead supply line to the building, a high energy Type 1 power SPD should be utilised at the service entrance to the building. They are designed to survive high stress environments. It is a requirement that they are installed where an external lightning protection system is fitted or the mains is fed from an overhead power cable. The Type 1 should be accompanied by downstream Type 2 Surge Protection Devices.

Type 2:
Generally, where buildings are located in areas that pose an unlikely risk of direct lightning strikes, such as urban areas, a Type 2 power SPD should be located at the service entrance. They are designed to be used in distribution boards downstream of a Type 1 SPD or in power supply panel / consumer unit where an external lightning protection system is not present, and the mains power is fed via an underground cable.

Type 3:
The Type 3 SPD is designed to provide the lowest level of protection to meet the voltage withstand of the equipment supplied by final distribution boards. The SPD may be of such a design that it can be positioned or connected directly to the critical equipment being protected.