

Article Overview

Surge protective devices (SPDs) should be installed as close as possible to the power supply entry point in the distribution box, typically on the supply side of the main circuit breaker, with proper grounding.

Placement in the Distribution Box

Type 1 SPDs are designed to handle high-energy surges from external sources such as lightning strikes or utility grid switching. They should be installed at the main distribution board where electricity enters the building, usually on the line side of the main circuit breaker. This ensures that high-energy surges are diverted to ground before reaching downstream equipment, protecting the entire electrical system . Type 2 SPDs are intended for the load side of the main service disconnect or at sub-distribution boards. They protect against residual surges that pass through Type 1 devices and internally generated surges from motors or variable frequency drives. Installing Type 2 SPDs at intermediate panels helps clamp voltage spikes and safeguard branch circuits . Type 3 SPDs are point-of-use devices installed as close as possible to sensitive equipment, typically within 10 meters. They handle low-level residual transients to protect electronics such as computers, PLCs, or medical devices .

Installation Guidelines

- o The SPD should be installed immediately where cables enter the distribution box to prevent surge propagation into the system .
- o Short, thick grounding wires must connect the SPD to the building's equipotential bonding system. Each centimeter of line length increases residual voltage, so the connection should be ≤ 0.5 meters .
- o In a three-phase five-wire system, the SPD can be installed in front of or behind the main air switch, depending on whether it is on the supply or load side .
- o A cascading protection strategy is recommended: Type 1 at the service entrance, Type 2 at distribution boards, and Type 3 near sensitive loads, ensuring progressive voltage reduction and comprehensive protection .

Summary

To maximize protection against lightning and transient surges:

- o Type 1 SPD: Supply side of the main breaker at the building entry.
- o Type 2 SPD: Load side of the main breaker or sub-panels.
- o Type 3 SPD: Directly upstream of sensitive devices.
- o Ensure short, properly sized grounding connections.
- o Follow a tiered, cascading installation for full system protection. This configuration ensures that surges are



Location of lightning protection distribution box

progressively mitigated, protecting both the distribution system and sensitive downstream equipment.

A list of lightning protection equipment and related product categories evaluated by UL Solutions, along with the applicable standard

The installation location of the SPD depends on specific surge protection requirements: for instance, to counter

Learn the best installation locations for lightning arresters in substations. Understand why

Lightning Protection System components are intended to be installed and used in accordance with UL 96A, the Standard for

A tiered surge protection strategy can significantly enhance the reliability and effectiveness of the building's internal

Class C 11kv lightning arrester price is installed in distribution boxes or at the front end of equipment, especially on

When protecting a power distribution network, the distribution box, as the central distribution point of the power

Learn how to install a distribution box safely and correctly. Covers wiring, placement, standards, and expert tips for a

Summary This Section specifies the lightning protection system for the building(s) or structure(s). This system provides safety for the

Grounding Electrode - The portion of a lightning protection system, such as a ground rod, ground plate, or ground conductor, that is

This power supply lightning protection box is widely used for lightning protection and overvoltage protection of the main power supply

Direct lightning strikes cause fire damage in excess of \$200 million per year, and insurance companies pay claims in the billions of

The National Electrical Code (NEC) 2023 says you must install surge protection in all homes, dorms, hotels,

and nursing homes. You

To ensure effective protection, the surge protection must be installed as close as possible to the feed point for the electrical system.

Lightning and surge protection may only be installed, put into operation and maintained by qualified electricians who are familiar with

Where: Type 2 SPD must be installed in the main distribution board or on the input side of the UPS system. This

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