

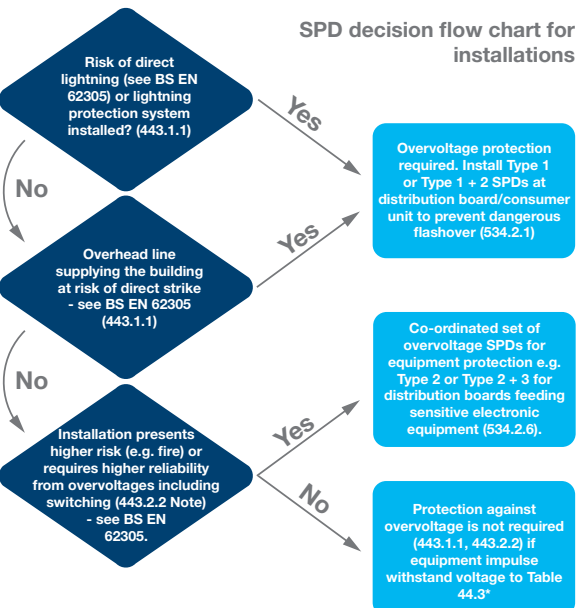
Quick Selection Guide

The following is a quick selection guide which may assist in choosing whether SPD's are required and the correct type of device:

- Does the installation contain a lightning protection system?
- Is the installation adjacent to any tall structure, tall trees or near a hill top in a lightning prone area?
- Does the installation contain equipment where higher reliability from overvoltages is required

If the answer is YES in the above to the first two questions, it is recommended to install a Type 1+2 device. This will provide protection against surges caused by direct lightning strikes and provide protection against transient over-voltages caused by indirect lightning strikes or by switching events.

If the answer is YES to the third question then it is recommended to install Type 2 devices to provide protection against transient over-voltages caused by indirect lightning strikes or by switching events.



* Note: For larger installations, a risk assessment method used to evaluate the need for SPDs is given in Section 443 of BS 7671:2008(2011).



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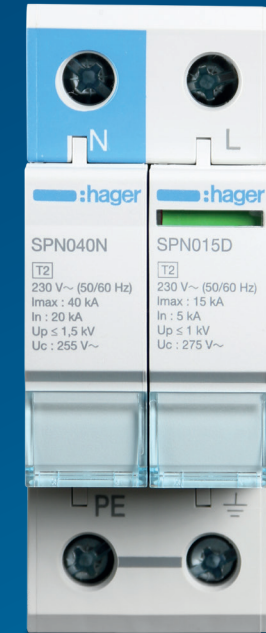
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Surge Protection Devices



At a Glance



Surges & The Dangers

The whole nature of how electrical equipment is used in homes and at work has evolved; with everyday activities relying on electronic equipment.

Products such as computers, printers, flat screen televisions, industrial control equipment such as PLC's, alarms, microwaves and washing machines are common place. These can all be vulnerable to **transient overvoltages**, which can significantly reduce the equipment's lifespan through degradation and damage.

A transient overvoltage or surge is a short duration increase in voltage measured between two or more conductors. In short this means anything from microseconds (millionths of a second) to a few milliseconds (thousandths of a second) in duration.



Surge Protection Devices

SPD's protect electrical and electronic equipment against transients, originating from lightning, switching of transformers, lighting and motors. These transients can cause premature ageing of equipment, downtime, or complete destruction of electronic components and materials. SPDs are strongly recommended for installations that are exposed to transients, to protect sensitive and expensive electrical equipment such as TVs, washing machines, PCs, alarms etc.

Choice

The choice of SPD depends on a number of criteria such as:

- The risk of lightning strikes
- The exposure of the building to transients.
- The sensitivity and value of the electrical equipment that requires protection.
- Earthing system
- Level of protection

Selection Criteria

Surge protection devices are classified according to their functions:

Type 1

SPD which can discharge partial lightning current with a typical waveform 10/350 μ s. Usually employs spark gap technology.

Type 2

SPD which can prevent the spread of overvoltages in the electrical installations and protects equipment connected to it. It usually employs metal oxide varistor (MOV) technology and is characterised by an 8/20 μ s current wave.

Type 3

These SPDs have a low discharge capacity. They must therefore only be installed as a supplement to Type 2 SPD and in the vicinity of sensitive loads. Type 3 SPD's are characterised by a combination of voltage waves (1.2/50 μ s) and current waves (8/20 μ s).

Terminology

I_{imp} – Impulse current of 10/350 μ s waveform associated with Type 1 SPD's

I_{η} – Surge current of 8/20 μ s waveform associated with Type 2 SPD's

U_p - The residual voltage that is measured across the terminal of the SPD when I_{η} is applied

U_c - The maximum voltage which may be continuously applied to the SPD without it conducting.