BS EN 61643 standard series

Furse SPDs meet the performance parameters defined in two national & European standards:

- BS EN 61643-11 Surge protective devices connected to low-voltage power systems - requirements and tests
- BS EN 61643-21 Surge protective devices connected to telecommunications and signalling networks - performance requirements and testing methods

These parts of the BS EN 61643 standard apply for all SPDs providing protection against lightning (direct and indirect) and transient overvoltages.

BS EN 61643-11 covers AC mains protection, for 50/60 Hz AC power circuits and equipment rated up to 1000 V_{RMS} AC and 1500 V DC.

BS EN 61643-21 covers telecommunications and signalling networks with nominal system voltages up to 1000 V_{RMS} AC and 1500 V DC.

Within these parts to the standard is defined:

- The electrical requirements for SPDs, including voltage protection and current limiting levels, status indication and minimum test performance
- The mechanical requirements for SPDs, to ensure an appropriate quality of connection, and mechanical stability when mounted
- The safety performance of the SPD, including its mechanical strength and its ability to withstand heat, overstress and insulation resistance

The standard establishes the importance of testing SPDs to determine their electrical, mechanical and safety performance.

Electrical tests include impulse durability, current limiting, and transmission tests.

Mechanical and safety tests establish levels of protection against direct contact, water, impact, the SPD installed environment etc.

For voltage and current limiting performance, an SPD is tested according to its Type (or Class to IEC[1]), which defines the level of lightning current or transient overvoltage it is expected to limit/divert away from sensitive equipment.

Tests include Class I impulse current, Class I & II nominal discharge current, Class I & II voltage impulse and Class III combination wave tests for SPDs installed on power lines, and Class D (high energy), C (fast rate of rise), and B (slow rate of rise) for those on data, signal and telecoms lines.

SPDs are tested with the connections or terminations following manufacturer's instructions, as per the expected SPD installation.

Measurements are taken at the connectors/terminals. Three samples of an SPD are tested and all must pass before approval is granted.

SPDs which have been tested to BS EN 61643 should be suitably labelled and marked, to include the relevant performance data for their application.

Technical Specifications

Within BS EN 61643 there are two Technical Specifications which provide recommendations on the selection and installation of SPDs.

These are:

- DD CLC/TS 61643-12 Surge protective devices connected to low-voltage power systems - selection and application principles
- DD CLC/TS 61643-22 Surge protective devices connected to telecommunications and signalling networks - selection and application principles

These Technical Specifications should be used with BS EN 61643-11 and BS EN 61643-21 respectively.

Each Technical Specification provides information and guidance on:

- Risk assessment and evaluating the need for SPDs in low-voltage systems, with reference to IEC 62305 Lightning protection standard and IEC 60364 Electrical installations for buildings
- Important characteristics of an SPD (e.g. voltage protection level) in conjunction with the protection needs of equipment (i.e. its impulse withstand or impulse immunity)
- Selection of SPDs considering the entire installation environment, including their classification, function & performance
- Coordination of SPDs throughout the installation (for power and data lines) and between SPDs and RCDs or overcurrent protective devices

Through following the guidance in these documents, appropriate specification of SPDs to meet the installation requirement can be achieved.

[1] Type 1, 2, or 3 SPDs to BS EN/EN 61643-11 are comparable to Class I, Class II and Class III SPDs to IEC 61643-11 respectively.