

Application and installation of Surge Protective Devices (SPD's) as recommended in "BS 7671:2008 Incorporating Amendment No 1: 2011 - Requirements for Electrical Installations: IET Wiring Regulations"

BS 7671:2008 Incorporating Amendment No 1: 2011 - Requirements for Electrical Installations: IET Wiring Regulations, published in July 2011, replaces: BS 7671:2008. The newly revised BS 7671 will affect all new installation as of 1st January 2012.

BS 7671 (The IET Wiring Regulations) is the national standard to which all domestic and industrial wiring must conform. The newly amended BS 7671 includes a large number of changes from the original 2008 document and has 70% of new content



BS7671:2008 - IEE Wiring Regulations 17th Edition – contained 'Section 443

Protection Against Overvoltages Of Atmospheric Origin or Due To Switching', which dealt with protection of electrical installations against transient overvoltages of atmospheric origin transmitted by the supply distribution system and against switching overvoltages generated by the equipment within the installation.

According to BS7671:2008, the use of surge protection may be based on a risk assessment method, however if there is a risk or consequence to human life, public services, IT centres, commercial or industrial activity, e.g, hotels, banks etc. **SPD's at the entrance of the installation are required**, and there is no need to perform the risk assessment, as this calculation always leads to the result that the protection is required. These levels directly correspond with those detailed in BS EN61643-12.

Amendments to the above now incorporated into '**BS 7671:2008 Incorporating Amendment No 1: 2011 - Requirements for Electrical Installations: IET Wiring Regulations**' include those to **Chapter 53**, which now contains a new Section 534 'Devices for protection against overvoltage', which deals with the installation of surge protective devices (SPD). The requirements of Section 534 are for the selection and erection of SPDs for electrical installations of buildings in order to limit transient overvoltages of atmospheric origin transmitted via the supply distribution system and against switching overvoltages. The requirements are also intended to protect against transient overvoltages caused by direct lightning strikes or lightning strikes in the vicinity of buildings protected by a lightning protection system (LPS). The requirements do not take into account surge protective components, which may be incorporated in the appliances connected to the installation.

534 DEVICES FOR PROTECTION AGAINST OVERVOLTAGE

For further information see Appendix 16.

534.1 Scope and object

This section contains provisions for the application of voltage limitation to obtain insulation coordination in the cases described in Section 443, BS EN 60664-1, BS EN 62305-4 and BS EN 61643 (CLC/TS 61643-12). Protection against malfunction of electrical and electronic equipment due to overvoltages is not covered in this section. Protective measures against malfunction of such equipment are detailed in the BS EN 61643 series (CLC/TS 61643-12). BS EN 62305-4 and CLC/TS 61643-12 deal with the protection against the effects of direct lightning strokes or strokes near to the supply system. Both documents describe the selection and the application of surge protective devices (SPDs) according to the lightning protection zones (LPZ) concept. The LPZ concept describes the installation of Type 1, Type 2 and Type 3 SPDs.

SPDs, specific isolating transformers, filters or a combination of these may be used for protection against overvoltages.

These requirements are for the selection and erection of:

- (i) SPDs for electrical installations of buildings to obtain a limitation of transient overvoltages of atmospheric origin transmitted via the supply distribution system and against switching overvoltages
- (ii) SPDs for the protection against transient overvoltages caused by direct lightning strokes or lightning strokes in the vicinity of buildings protected by a lightning protection system.

These requirements do not take into account surge protective components which may be incorporated in the appliances connected to the installation. The presence of such components may modify the behaviour of the main surge protective device of the installation and may need an additional coordination.

These requirements also cover protection against overcurrent due to SPD failure and the consequences of that failure.

NOTE 1: For example, failure can be due to mains supply faults or due to the SPD reaching the end of its life.

These requirements apply to a.c. power circuits.

NOTE 2: Overvoltages of atmospheric origin and electrical switching events can affect metallic data, signal and telecommunication lines. Protection measures for these systems are detailed within CLC/TS 61643-22.

534.2 Selection and erection of surge protective devices

534.2.1 Use of SPDs

Where required by Section 443 or otherwise specified, SPDs shall be installed:

- (i) near the origin of an installation, or
- (ii) in the main distribution assembly nearest the origin of an installation.

NOTE 1: Annex E of CLC/TS 61643-12 provides examples of application of the risk analysis as described in Section 443.

When two or more SPDs are used on the same conductor, they shall be coordinated and as such are referred to as coordinated SPDs. In accordance with BS EN 62305-4, protection of electrical and electronic systems within structures requires coordinated SPDs.

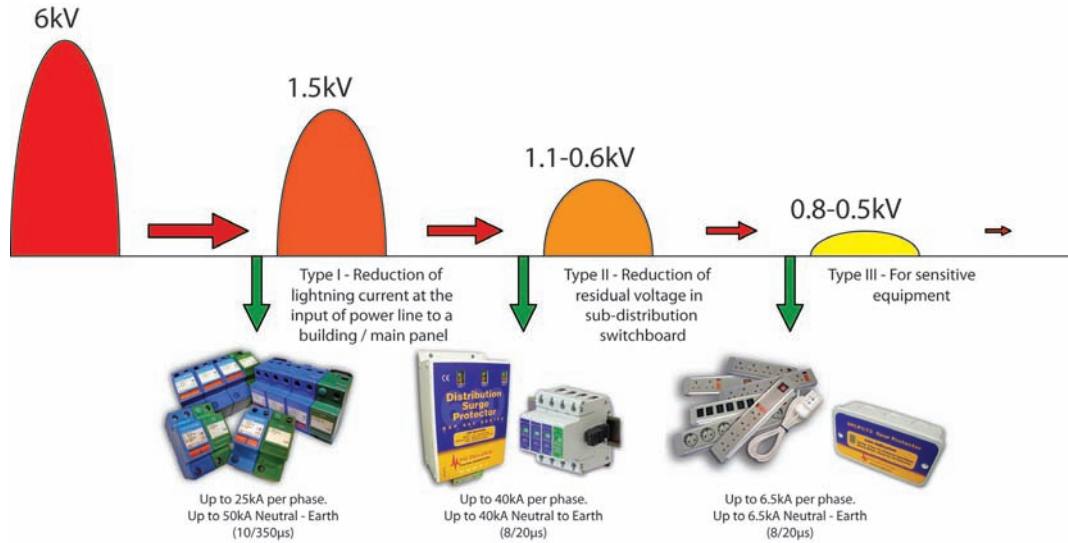
Where required and in accordance with BS EN 62305-4 or otherwise specified, SPDs shall be installed at the origin of an installation.

NOTE 2: Depending on the voltage stress, Type 1 or Type 2 SPDs may be used at the origin whilst Type 2 or Type 3 are also suited for location close to the protected equipment to further protect against switching transients generated within the building.

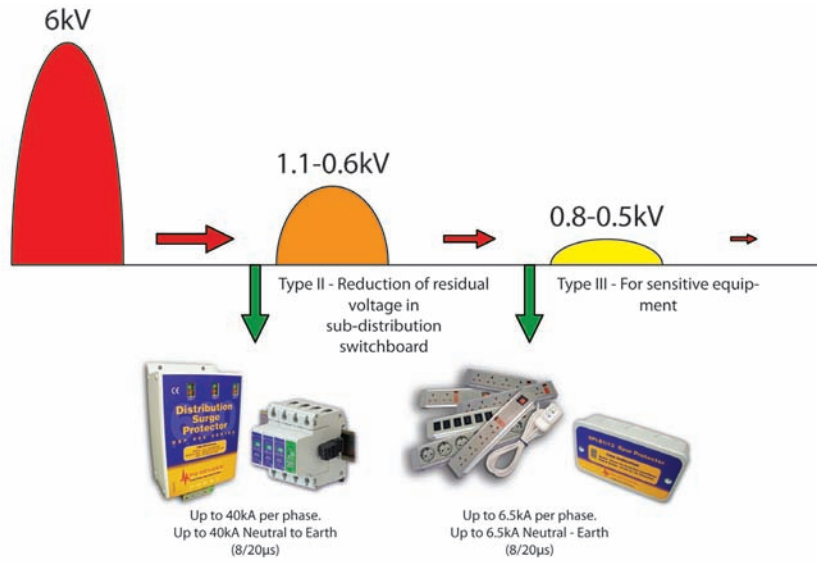
NOTE 3: Type 1 SPDs are often referred to as equipotential bonding SPDs and are fitted at the origin of the installation to specifically prevent dangerous sparking which could lead to fire or electric shock hazards. A lightning protection system which only employs equipotential bonding SPDs provides no effective protection against failure of sensitive electrical and electronic systems.

Additional SPDs are required to protect sensitive and critical equipment (for example hospital equipment and fire/security alarm systems). Such SPDs shall be coordinated with the SPDs installed upstream and be installed as close as practicable to the equipment to be protected. Where SPDs are required in accordance with Section 443 or BS EN 62305-4, consideration shall be given to the installation of SPDs on other incoming networks (such as metallic telecommunication and signalling services).

Example of 3 Stage co-ordinated surge protection where power is supplied by overhead power lines and / or LPS installed, in accordance with BS 7671:2008 Incorporating Amendment No 1: 2011



The use of 2 Stage surge protection where power is supplied by underground power lines and no LPS installed, in accordance with BS 7671:2008 Incorporating Amendment No 1: 2011



PD Devices are a specialist designer and manufacturer of Surge Protection Devices (SPD's) and Transient Voltage Surge Suppression (TVSS), and supply a wide range of products and custom-designed solutions to protect against damage from lightning and transient over-voltages. Our extensive range provides a co-ordinated system for total site protection, and is designed to provide comprehensive protection at a reasonable cost, beginning where power, data, and telecom lines enter a building, through to special devices for extremely sensitive or critical equipment. Protection products and components are designed and manufactured to meet the requirements of BS EN 62305-4:2006, BS EN 61643-11/12, and BS EN 61643-21/22.

To find out more, please contact our sales team on **01364 649248** or please visit - <http://www.pddevices.co.uk>

Permission to reproduce extracts from BS 7671:2008 Incorporating Amendment No 1: 2011 is granted by the Institute of Engineering and Technology (IET) and the British Standards Institution (BSI). No other use of this material is permitted. BS 7671:2008 Incorporating Amendment No 1: 2011 can be purchased in hardcopy format only from the IET website <http://electrical.theiet.org/> and the BSI online shop: <http://shop.bsigroup.com>

All of the above information, including drawings, illustrations and graphic designs, reflects our present understanding and is to the best of our knowledge and belief correct and reliable. Users, however, should independently evaluate the suitability of each product for the desired application. Under no circumstances does this constitute an assurance of any particular quality or performance. Such an assurance is only provided in the context of our product specifications or explicit contractual arrangements. Our liability for these products is set forth in our standard terms and conditions of sale.

