

# Lightning and Surge Protection



Compared with Europe and the rest of the world, the United Kingdom has a low rate of lightning strikes although any building will benefit from the installation of a lightning conductor system.

The risk to people in or around buildings is extremely small and the primary function of a lightning protection system is the protection of property rather than of life.

There are two types of lightning damage, namely direct effects to the structure and indirect effects to the electrical wiring and equipment.

Direct effects are usually minor, damaging coping stones, finials etc., although there is also the possibility of fire and secondary damage from falling masonry. However, even minor damage can be costly to repair where high level access is required.

Most indirect effects from lightning damage result from voltage surges causing shutdown, malfunction or the complete burnout of electronic systems.

Nearly all buildings will contain some form of electronic equipment, for example, fire and intruder alarm systems, telephone systems, computers and associated data storage and audio-visual equipment.

All such equipment is at risk of damage from unwanted voltages known as surges, spikes or transients. These surges can be very damaging to electronic components such as printed circuit boards and may result in the loss of a facility such as a fire alarm, computer or telephone system.

The most common and the most damaging surges are those caused by lightning which produce voltage surges on overhead and underground cables, both power and communications.

Prior to August 2008, systems should have been installed to BS 6651, Code of Practice for Protection of Structures against Lightning. A typical system, generally described as a Faraday Cage system, comprises a mesh of conductors at intervals laid over the roof and down the walls of the building, and connected to the ground by earth-electrodes. Most existing systems, particularly in older buildings, however, predate the recommendations of BS 6651 and have changed very little over the last 100 years.

From August 2008, BS 6651 was replaced by BS EN 62305. This standard is considerably larger and more complex. There are four main parts covering (1) General Principles, (2) Risk Management, (3) Physical Damage to Structures and Life Hazard and (4) Electrical and Electronic Systems within Structures. The protection of electronic equipment is now an integral part of the standard.

Whilst BS 6651 recommended that lightning protection systems should be inspected and tested at fixed intervals, preferably not exceeding twelve months, the maximum interval under BS EN 62305 is four years, reducing to two years for Class I and II Lightning Protection Systems. A visual inspection of the system should, however, be undertaken on an annual basis. It is also advisable that an inspection and test is undertaken following a strike, or suspected strike, as some damage may have occurred.

There are a range of devices designed to provide surge protection for different types of equipment and it is essential that specialist advice is obtained before installation. Only electrical contractors with full scope registration or membership to work on commercial installations with the National Inspection Council for Electrical Installation Contracting (NICEIC), The Electrical Contractors Association (ECA), The Electrical Contractors' Association of Scotland (SELECT) or The National Association of Professional Inspectors and Testers (NAPIT) should be employed.

Mains surge protection devices should always be installed in accordance with BS 7671, the Institution of Engineering and Technology Requirements for Electrical Installations, current edition.

This is only a brief summary of a very complex subject. Specialist advice must always be sought before installing any electrical equipment and installation must only be undertaken by competent persons.

Advice from a lightning protection specialist should be sought where external electrical equipment, including its cabling, is to be installed within one metre of lightning conductors (including earth conductors) to determine if there is adequate separation or whether bonding is required.

The design of a lightning protection system should be carried out by a specialist such as a consulting engineer, preferably a member of the Association of Consulting Engineers, with experience in lightning protection systems.

Only specialist contractors with experience in this kind of work should be employed for the installation, maintenance and periodic testing of lightning protection systems, such as members of the Association of Technical Lightning and Access Specialists (ATLAS). For details of ATLAS certified members in your area visit their website [www.atlas.org.uk/find-a-member.asp](http://www.atlas.org.uk/find-a-member.asp).

## Need to contact us?

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