

## Fire Alarms

### **1. Which British Standards give requirements for fire alarm detection and fire alarm systems and what areas do they cover ?**

The principle British Standards giving requirements for the installation of fire alarm systems are BS 5839 Part 1 and 6.

BS 5839 Part 1 is dated 2002 and gives recommendation for the planning, design, installation, commissioning and maintenance of fire detection and fire alarm systems in and around buildings other than dwellings. It does not, however, recommend whether or not a fire alarm system should be installed in any given premises.

BS 5839 Part 1 is entitled: Fire detection and fire alarm systems for buildings. It is the Code of Practice for system design, installation, commissioning and maintenance. In BS 5839, the term fire detection and alarm systems include systems that range from those comprising only one or two manual call points and sounders to complex networked systems that incorporate a large number of automatic fire detectors, manual call points and sounders, connected to numerous inter-communicating control and indicating panels. The term also includes systems that provide signals to initiate the operation of other fire protection systems and equipment (such as fire extinguishing systems, smoke control systems or automatic door release equipment) or safety measures (such as shut down of air handling systems or grounding of lifts). It does not apply to the other systems and equipment themselves or the circuit that interface with them.

These parts of BS 5839 do not cover systems which extinguish or control fires, such as sprinklers or automatic extinguishing systems. They do cover the use of a signal from an automatic extinguishing system as one initiating element of a fire alarm system (e.g. by use of a pressure or flow switch).

Part 1 and 6 do not cover voice alarm systems, 999 public emergency call systems, manually or mechanically operated sounders, or systems combining fire alarm functions with other non-fire related functions.

BS 5839 Part 6 is dated 1995 and is entitled: Fire detection and alarm systems for buildings. It is the Code of Practice for the design and installation of fire detection and alarm systems in dwellings. Part 6 gives recommendation for the planning, designing and installation of fire detection and alarm systems in dwellings. The recommendations apply to both new dwellings and existing dwellings. The systems covers in this part range from those comprising a single self-contained smoke alarm to the fire detection components of combined domestic fire and intruder alarm systems or fire alarm systems.

Part 6 applies to forms of dwelling including bungalows, multi-storey houses, individual flats and maisonettes, mobile homes, sheltered houses, NHS housing in the community and houses divided into several self-contained single-family dwelling units. This part is intended for use by architects, enforcing authorities, contractors and others responsible for implementing fire precautions.

The remainder of the BS 5839 series of standards consists of:

- Part 2 Fire detection and alarm systems for buildings. Specification for manual call points
- Part 3 Fire detection.... Specification for automatic mechanism for certain fire protection equipment
- Part 4 Fire detection.... Specification for control and indicating equipment
- Part 5 Fire detection.... Specification for optical beam smoke detectors
- Part 8 Fire detection.... Code of practice for the design, installation and servicing of voice alarm systems.

## 2. How do I establish if particular building needs a fire alarm system?

The need for a fire alarm system in any specific building will normally be determined by the authority responsible for enforcing fire safety legislation in that building and/or by a fire risk assessment carried out by the owner, landlord, occupier or employer, as appropriate. In general, it is appropriate to install some form of fire alarm system in virtually all buildings, other than very small premises that are relatively open-planned so that any fire will be quickly detected.

Manual fire alarm systems are often sufficient to satisfy legislation in workplaces in which no one sleeps. Automatic fire detection is usually required by legislation to supplement the manual system in premises in which people sleep. Automatic fire detection may also be necessary to satisfy legislation under the following circumstances:

- a) where the automatic fire detection forms part of a fire engineering solution;
- b) where fire protection systems, such as door closing facilities or smoke control systems, are to be operated automatically in the event of fire;
- c) where the low level of occupancy of a building is such as to create the potential for fire to prejudice the means of escape by occupants before they are aware of the fire.

Automatic fire detection is also commonly used to protect property by ensuring early attendance of the fire service. Automatic fire detection systems might be required or recommended by the property insurers. The early detection of fire by automatic means and rapid summoning of the fire service, is also important in premises in which people cannot readily be evacuated in the event of a fire (e.g. hospitals)

## 3. What are the categories of fire alarm system?

Fire alarm systems may be installed in buildings to satisfy one or both of two objectives – protecting life and protecting property. Other possible objectives exist, such as protection against business interruption and protection of the environment. Because of the variety of application, systems are divided into a number of different Categories:

Category M These are manual systems and incorporate no automatic fire detectors.

Category L Category L systems are automatic fire detection systems intended for the protection of life. They are subdivided into:

- a) Category L1: systems installed throughout all areas of the building
- b) Category L2: Systems installed only in defined parts of the building
- c) Category L3: systems designed to give a warning of fire at an early enough stage to enable all occupants, other than possibly those in the room of origin, to escape safely before the escape routes are impassable owing to the presence of fire, smoke or high fire risk;
- d) Category L4: systems installed within those parts of the escape routes comprising circulation areas and circulation spaces, such as corridors and stairways, in order to enhance the safety of the occupants by providing warning of smoke within escape routes;
- e) Category L5: system in which the protected area and /or the location of detectors is designed to satisfy a specific fire safety object (other than that of a L1, L2, L3 or L4 system)

Category P Category P systems are automatic fire detection systems intended for the protection of property. They are subdivided into:

- a) Category P1: systems installed throughout all areas of the building
- b) Category P2: systems installed only in defined parts of the building

#### **4. For a dwelling, where should smoke detectors be installed?**

The presence of smoke in escape routes is the greatest impediment to safe escape in the event of fire. It is essential that any fire starts in a circulation area, or smoke spreads into a circulation area, be detected as early as possible. Smoke detectors should therefore be installed in the circulation areas of all dwellings.

#### **5. How should the fire alarm system in a building be electrically supplied?**

The mains supply final circuit to all parts of the fire alarm system should be dedicated solely to the fire alarm system, and should serve no other system or equipment. The circuit should be derived from a point in the building's electrical distribution system close to the main isolating device for the building.

Every isolator and protective device that can isolate the supply to the fire alarm system, other than the main isolator for the building, should be labelled:

Fire Alarm in the case of a protective device that serves only the fire alarm circuit, but incorporates no switch;

Fire Alarm. Do not switch off. Where fire protection system, such as door closing facilities or smoke control systems, are to be operated automatically in the event of fire;

Fire Alarm. This switch also controls the supply to the fire alarm system. In the case of any switch that disconnects the mains supply to both the fire alarm system and to other circuits.

Every isolator, switch and protective device that is capable of disconnecting the mains supply to the fire alarm system should be situated in a position inaccessible to unauthorized person or be protected against unauthorized operation by persons without a special tool. The circuit supplying the fire alarm system should not be protected by an RCD unless this is necessary to comply with the requirements of BS 7671. Where an RCD is necessary for electrical safety, a fault on any other circuit or equipment in the building should not be capable of resulting in isolation of the supply to the fire alarm system.