HMO Information Sheet No 1

FIRE DETECTION AND ALARM SYSTEMS

1. Introduction

When a property is in multiple occupation, the risk of fire breaking out is greater than in an ordinary single family home. Some of the reasons for this are:

- Portable heating appliances may be used
- Electrical circuits can become overloaded
- There is often more than one kitchen present (a high risk area)
- There are people in the house who are living independently of, and having no control over, each other's behaviour.

If a fire should break out in a large HMO, escape can be difficult because of the distance of travel and height above ground level. The risk of serious injury or death can therefore be increased. In addition, if a fire breaks out, the person who discovers it may not know who else is in the house and is less likely to check all the rooms to make sure everyone has escaped.

Statistics show that, occupiers of HMO’s are exposed to an increased risk of death or injury compared with other residents.

2. What is an Automatic Fire Detection System?

An automatic fire detection and fire alarm system (AFD) is the most effective way of warning all occupants of the existence of fire. Therefore it is essential that occupants of HMO’s are made aware at the earliest opportunity of the existence of fire in their home.

The type of automatic fire detection required will depend on the level of risk. This is affected by the number of floors, size and layout of the property, the number of occupants and the nature of the occupancy.

The need to protect the occupants of individual units from the effects of fire in their own accommodation should be the subject of individual risk assessments. If the occupants are at increased risk from fire because of their health or lifestyle, or are considered to be particularly vulnerable because of their age, the provision of additional smoke detectors/alarms should be provided. Also the design of the AFD should have regard to limiting false alarms.
Fire Alarm Systems need to be tailored to each individual property in accordance with the current BS 5839 Part 6: Fire Detection and Alarm Systems for Buildings. Code of Practice for the Design, Installation and Maintenance of Fire Detection and Fire Alarm Systems in Dwellings. This fact sheet also incorporates the information provided by the Fire Safety Risk Assessment Sleeping Accommodation Guide.

Your AFD should typically include some or all of the following:

- Fire Detectors e.g. smoke and heat
- Manual call points (break glass call points) next to exits with at least 1 call point on each floor
- Electronic sirens or bells
- A control and indicator panel

The specific components of your AFD will be determined by the significant findings or your Fire Risk Assessment (* refer to FRA Fact Sheet). However suggested standards of automatic fire detection are listed below:

<table>
<thead>
<tr>
<th>Type of Premise</th>
<th>Grade/ Category of AFD¹</th>
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<tbody>
<tr>
<td>Houses in Multiple Occupation of more than 2 storeys (more than one floor above ground) or any floor &gt;200m²</td>
<td>Grade A LD2 in common areas²</td>
</tr>
<tr>
<td>Flats and conversions that have not been constructed to Building Regulation Standards</td>
<td></td>
</tr>
<tr>
<td>Houses in Multiple Occupation of up to two storeys (up to one floor above ground) with any floor &lt;200m²</td>
<td>Grade D LD2 or LD3²</td>
</tr>
</tbody>
</table>

¹ The outcome of your Fire Risk Assessment will determine the necessary standard of AFD required, e.g. in some cases, a BS 5839 Part 1 Category L1 system may be appropriate

² An individual private dwelling should have a Grade D LD2 or LD3 system but this need not be interconnected with the system that covers the common areas of the building, where the dwelling is a flat.

<table>
<thead>
<tr>
<th>Key</th>
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<tbody>
<tr>
<td>Grade A LD2</td>
<td>An automatic fire detection system which incorporates control and indicating equipment conforming to BS EN54-2, and power supply equipment conforming to BS EN54-4 (designed for dwellings and based on a BS5839 part 1 system) with detectors sited in escape routes (including rooms that open onto escape routes) and in rooms or areas that present a high fire risk to occupants, detailed in BS 5839 Part 6.³</td>
</tr>
<tr>
<td>Grade D LD2</td>
<td>An automatic fire detection system (designed for dwellings) based on interconnected mains powered smoke alarms (with battery back-up) with detectors sited in escape routes</td>
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</tbody>
</table>
(including rooms that open onto escape routes) and in rooms or areas that present a high fire risk to occupants, detailed in BS 5839 Part 6.

| Grade D LD3 | An automatic fire detection system (designed for dwellings) based on interconnected mains powered smoke alarms (with battery back-up) with detectors sited in escape routes (including rooms that open onto escape routes) detailed in BS 5839 Part 6. |

2 The following features are specifically detailed within separate clauses of BS 5839:

- Audible Fire Alarm devices and audibility – clause 13
- Fire Alarm warnings for Deaf and Hard of Hearing people – clause 14
- Manual call points – clause 18
- Capacity of Standby batteries – clause 15.2c
- Radio-linked systems – clause 21

3. Components of an Automatic Fire Detection System

The main components of AFD systems installed in HMO’s covered by this factsheet are as follows:

A. Smoke Detectors

There are two main types of smoke detectors, **Ionisation** and **Optical**, and they must comply with the current BS 5446 Part 1.

(i) **Ionisation smoke detectors** are more sensitive to rapid flaming fires such as a chip pan fire. Therefore, they can be prone to false alarms from cooking vapours and should not be located near kitchens. Cigarette smoke will normally activate this type of smoke detector. This detector is appropriate for bedroom, dining and living rooms depending on the particular circumstances i.e. suitable for rooms where flaming fires could rapidly block an escape route.

(ii) **Optical smoke detectors** are more sensitive to small smouldering fires of the types frequently associated with burning foam filled furniture. These detectors are less vulnerable to false alarms from cooking vapours but more prone to false alarm from dust or insect ingress. These detectors are suitable for general use, appropriate for bedroom, dining and living rooms and for circulation areas i.e. halls, landings and cellars.

B. Heat Detectors

Heat detectors are sensitive to temperatures between 54°C - 62 °C and should comply with the current BS 5446 Part 2. There are two types of heat detector, **fixed temperature** and **rate of rise** detector.

(i) **Fixed Temperature heat detector** is preset to react to temperatures above a certain level. These detectors are suitable for kitchens, boiler rooms and laundries.

(ii) **Rate of Rise heat detector** reacts when the rate of temperature increase is rapid. These detectors are suitable for use in rooms other than kitchens and boilers room but where detection is required but smoke detectors would result
in too many false alarms e.g. a living room directly off a kitchen not separated by a fire door.

Detectors should be selected so as to give the earliest possible warning in the event of a fire but also minimise the risk of false alarms. The negative effect of persistent false alarms, which result in complacency by the occupants, cannot be overemphasised. The type of detector to be installed in a HMO will be determined by the significant findings of the Fire Risk Assessment.

Smoke and Heat detectors are individual components of Grade A LD2 & Grade D LD2 & Grade D LD3 AFD systems

C. Manual Call Points

Manual call points must comply with the current BS EN 54-11.

Manual call points, often referred to as ‘break glass’ call points, enables a person who discovers a fire to immediately raise the alarm and warn other people in the property of the danger. Manual call points in HMO’s have the following features:

- Positioned at exits and storey exits that people may reasonably be expected to use in the event of fire (*protected escape route.).
- A delay between operation of a manual call point and the sounding of the fire alarm signal should not exceed 3 seconds.
- They should be fixed at a height of 1.2m above finished floor level.
- From any point in the dwelling it should not be necessary to travel more than 45m to reach the nearest manual call point.
- Each should be visible and easily detected and not recessed into the wall.

Manual call points are a component of a Grade A LD2 AFD system.

D. Electronic Sounders or bells

These may be individual sirens or bells or be integrated into the smoke or heat detector heads. They should be capable of reaching sound levels of 75decibels (Db(A)) in each bedroom at the bed head with all doors shut. This is the sound level regarded as being necessary to wake an ‘average’ person from sleep. Audibility of the fire alarm should be in accordance with the recommendations of BS 5839 Part 6.
Sounders and bells (either individual or combined with detectors) are components of Grade A LD2 & Grade D LD2 & Grade D LD3 AFD systems.

E. Control and Indicator Panel

A control and indicator panel receives information from detectors or call points and activates remote alarm sounders. The control panel should be situated where all occupants have access to it and, ideally, close to the main entrance of the property so that the Fire Brigade can determine the location of the fire. In some properties the alarm system is broken up into zones and these are indicated on the control panel. A plan of the building should be displayed adjacent to the control panel indicating the location of each zone. The control panel contains the back-up battery supply, which is continuously charged from the mains. The control and indicator panel must comply with BS 5839 Part 4 and be provided with a visual and audible warning of any fault in the system.

Control and indicator panel is a component of a Grade A LD2 AFD system

4. Installation of an AFD

The installation of an AFD must be in accordance with the current BS 5839 Part 6 specific to the Grade of system as follows:

(i) Power Supply for a Grade A AFD – should comply with the recommendations of Clause 25 of BS 5839 Part 1. The power supply should not have any means of isolation within the dwelling and it is not acceptable for the mains supply to be connected via a card-operated meter, or similar. The stand-by supply should be capable of automatically maintaining the system in normal operation (whilst giving an audible and visual indication of mains failure) for a period of 72 hours.

(ii) Power supply for a Grade D AFD – the normal supply for smoke and heat detectors in this system should be derived from the public electricity supply to the property. The supply can take the form of either an independent circuit at the property’s main distribution board or via a regularly used, separately protected, mains circuit i.e. lighting.

(iii) Wiring for a Grade A AFD – cable systems used in this grade of AFD should, as a minimum, comply with all the recommendations of the current BS 5839 Part 1 for standard fire resisting cables.

(iv) Wiring for a Grade D AFD – cables between smoke and heat detectors may comprise of any type of cable suitable for domestic mains wiring and should be installed in accordance with the relevant recommendations of the current BS 7671. Cables should be protected against damage by installing the wiring in conduit, ducting or trunking.
(v) **Radio-Linked Systems** - also called wireless systems, can be considered in a Grade A or D AFD system as per the current BS 5839 Part 6. A specialist fire alarm contractor will need to be consulted to confirm whether or not they can provide a system that meets the recommendations of the British Standard mentioned above.

5. **Certification of the AFD Installation**

The installer must certify that the installation conforms to the recommendation of the current BS 5839 Part 6 detailing the Grade and Category of system installed. A copy of the certificate must be forwarded to Private Sector Housing, Cliftonville House, Bedford Road, Northampton, NN4 7NR.

Suppliers of your AFD system should provide you with clear and readily understood information on the system and its use. All alarms should come complete with user instructions, operation guidance, testing, maintenance, false alarms, escape plans and siting.

6. **Maintenance of an AFD**

It is essential that the system is subject to periodic inspection, so that unrevealed faults are identified, and, in the case of more complex systems, so that preventive measures can be taken to ensure the continued reliability of the system.

(i) **Grade A AFD** – this system should be subject to periodic inspection and servicing as specified under the current BS 5839 Part 6 but should not exceed 6 monthly intervals. The periodic inspection and servicing needs to be carried out by a competent person with specialist knowledge of fire detection and fire alarm systems, including knowledge of the causes of false alarms, sufficient information regarding the system, and adequate access to spares. This will normally be carried out by a competent fire alarm servicing organisation. A competent fire alarm servicing organisation is one that is approved by BAFE (British Approvals for Fire Equipment Scheme) or BRE (Building Research Establishment) Certification scheme.

(ii) **Grade D AFD** – this system should be cleaned periodically in accordance with the manufacturers’ instructions. It is highly recommended to carry out regular checks of the system by utilising the integral test button and maintain a record of these checks. The system should always be checked if the occupier has been away or there has been an interruption in the power supply.
7. Testing of an AFD

All Grades of system need to be tested periodically to ensure that there has not been any major failure. This does not require any specialist knowledge, and can normally be carried out, by an occupier of the property or the landlord, who will, however, need simple instructions in how to do so.

(i) Grade A AFD – this system should be tested every week in accordance with the recommendations of Clause 44.2 of BS 5839 Part 1: 2002.

(ii) Grade D AFD – this system should be tested at least every week by operating all fire alarm devices in the property. The weekly test can be carried out by use of a test button on each of the smoke alarms and heat alarms installed in the property.

This document has been produced by Corby Borough Council and provides a guide to Automatic Fire Detection and Fire Alarm Systems for HMOs. For specific advice please contact the Private Sector Housing Team on 01536 464182.