

Ultimate Fire Alarm Guide 2015





Contents

Chapter 1.....Types of Fire Alarm Systems

Chapter 2.....Types of Detectors

Chapter 3.....Categories of Fire Detection

Chapter 4.....Regulations and Standards

Chapter 5.....System Maintenance



Types of Alarm System

Fire Alarm Systems are not required for domestic use; smoke and heat detectors are usually sufficient.

All fire alarms work on the same basic principle – they detect smoke or heat and sound an alarm to warn people of potential danger. However there are many types of system to choose from.

Convention Alarm Systems

- Circuit based system comprised of detectors in different zones wired to a central control panel.
- Once a fire has been detected, an alarm will sound in that location to alert occupants.
- Useful to help you locate the source of a fire so that you can take action to isolate it.

Analogue Alarm Systems

- Also wired to a central control panel but these have a greater capacity than Conventional systems.
- Ideal for large premises as you can pinpoint the exact location of a fire.
- Variable sensitivity with very high potential.

Radio Alarm Systems

- Communicates with control panel over reliable licence-free UHF channels.
- Easy to install as no cabling is required, so can be installed without damaging walls.
- Suitable for Construction sites as they can be easily moved and relocated.

Wireless Alarm Systems

- Requires no cabling so are aesthetically pleasing.
- Works through radio frequency with 1.5km range meaning suitable for all size buildings.
- Easy to install and can be used on a temporary basis.



Voice Alarm Systems

- Play differing pre-recorded or live messages in different zones to direct to points of safety quickly.
- This is effective in prisons or hospitals as different advice can be given to different areas.
- There is evidence to show voice alarm systems speed up evacuation time.

VESDA/ASD Alarm Systems

- “Very Early Smoke Detection Apparatus” alarm systems can detect fire before there is any smoke.
- Gives a very early warning about fire to occupants.
- This allows early investigation to the causes and allow action to be taken.



Types of Detectors

Each detector is sensitive to a different type of fire so you will often find buildings need different detectors in different areas. Even in homes you may need a combination of heat and smoke detectors.

Smoke Detectors - Optical/Photoelectric

- Respond to smouldering fires caused by materials such as burning wood, paper and textiles.
- These are the ones you want in most rooms such as offices and store rooms.
- More expensive than Ionisation Detectors but they are often needed.

Smoke Detectors - Ionisation

- Sensitive to fast, clean burning fires fueled by paint thinners, petrol, paraffin, cooking oils.
- Also sensitive to dust, steam and airflow so are prone to false alarms if placed by bathrooms.
- Suitable for cleaner’s cupboards, surgical stores and kitchens.

Heat Detectors - Rate of Rise

- Operate when a sharp increase in room temperature occurs which is unsuitable for certain rooms.
- Ideal where smoke detectors are unsuitable, for example in smoky or steamy areas.
- A common example is the Apollo Rate of Rise Heat Detector.

Heat Detectors - Fixed Temperature

- Also suitable for smoky and steamy areas instead of smoke detectors.
- Operate when a certain temperature is reached meaning they won’t be triggered by fluctuations.



Carbon Monoxide Detectors

- Carbon Monoxide is poisonous but cannot be smelt, heard or tasted so CO Detectors are important.
- Ideal in any room with a fuel-burning appliance or in a central location.
- Detects fires in early stages (smouldering) but should be used in conjunction with smoke detectors.

Beam Detectors

- Detects fires in large, open areas (such as factory floors) where wired systems are unsuitable.
- Range of 100m with a 15m coverage area as standard. Therefore, 1500m² is covered.
- They can be installed at heights above the capacity of other detectors.

ASD Detectors

- Air Sampling Detectors or Aspirating Detectors analyse the airflow content.
- Air is drawn through sampling pipes in the ceiling and screened for smoke in a central chamber.
- Very useful in high value and high risk areas as they detect fires early.



Categories of Fire Detection

There are three main categories of fire detection: M, L and P. They are not mutually exclusive with building and life protection, often requiring elements from all three categories. For example buildings with comprehensive protection will further benefit from manual call points where people may be able to alert to the fire faster than its automatic detection.

Category M

Manually Operated Systems with No Automatic Fire Detectors

- Installed in areas where people are present during opening hours, eg in non-residential workplaces.
- They are often installed in union with other automatic detectors to satisfy insurance requirements.

Category L

Automatic Systems & Alarms Intended Primarily for Protection of Life.

Category L is divided into 5 sub-categories:

- L1: Systems installed to offer earliest warning of fire and allow most time for occupant escape.
- L2 & L3: Installed in defined parts of buildings. Designed to raise the alarm early enough for escape.
- L4: Systems installed in the escape routes such as corridors and stairwells.
- L5: System designed to fulfill specific objectives in respect of fire safety not covered by L1-L4.

L4 and L5 are often used in conjunction with category M elements to ensure escape routes are safe to use. Also, L5 can use smoke detectors positioned low down to ensure the early “cool smoke” of a fire cannot pass underneath them. It can also be used to trigger magnetic fire doors to inhibit the spread of a fire.



Category P

Automatic Protection Intended Primarily for Protection of Property.

Category P is divided into 2 sub-categories:

- P1: Installed throughout buildings for earliest warning of fire to allow the arrival of the fire service.
- P2: Installed in defined parts of building to ensure high value and high risk areas are protected.

Category P is appropriate for unoccupied buildings since geared towards protection of property. However if there is an overnight security presence, for example, it is often useful to be used with category M protection also.



Regulations & Standards: Fire Alarm Systems

Statutory Regulations

As well as government legislation, local authorities at district and county level produce byelaws and policy documents dictating regulations of fire alarm system application. Advice must be sought from each local authority to ensure that all regulations are being followed.

British standards for installation of alarms in non-domestic premises is BS 5839-1:2012 and BS 5839-6:2013. These control the design, installation and maintenance of fire detection and fire alarm systems in dwellings. Full examination of all documents is essential to ensure compliance.

British Standards

British Standard Specification is essential to the quality functioning of your Fire Alarm System. The installer of your system must have full knowledge of your requirements and the BSS requirements. You should be given a commissioning certificate to prove the Fire System meets all the requirements post-intallation.

Importance of Compliance

Compliance with all standards and regulations ensures that the Fire Safety System is working efficiently and to a high standard. If this is not the case there can be many consequences such as false alarms. False Alarms just in the West Midlands (2013) cost £1.9 million as well as many man hours that could have been spent fighting real fires and saving lives.

It is also in your interest to ensure your fire system is compliant. Not only do false alarms cost the fire service £400 per call out but it also costs your business too! The time spent evacuating the building and resetting the fire systems can be very time consuming and disruptive.



Maintaining Your System

Human observation and maintenance of systems are always required no matter how state-of-the-art and automatic a detector is.

Human maintenance and intervention is essential as they allow you to:

- Find faults and take actions to fix them.
- Ensure there was no major failures in the system.
- Familiarise occupants of building with the Fire Alarm System.

As such, testing of the alarm by premise management is essential and can be divided into weekly, monthly testings and inspections.

Weekly Routine

The Standard gives recommendations for weekly testing:

- Test manual call points during working hours of the premises at the same time each week.
- If there are multiple call points then a different one should be tested each week until all are tested.
- Tests should be less than one minute to allow occupants to distinguish between real alarms.

Monthly Routine

The Standard gives recommendations for monthly testing:

- If an emergency generator is used in the standby power supply this should be tested monthly.
- If the standby power supply is provided by batteries this should be inspected monthly.