data sheet

# MINERVA

# M600/M900 Fire Detection Range

Key Features

- **Intelligent Universal Smoke Detector**
- **Low profile, discreet and unobtrusive**
- **Superior performance and reliability**
- **Attractive new design**
- **Smart Card Addressing Technology**
- **Designed for fast easy installation**
- **Optional Locking Kit**
- **May be used in systems that meet BS5839 Pt1**
- **Integral and remote alarm LED**
- **Wiring polarity independent**
- **LPCB approved to EN54**

Our sophisticated new low profile range of fire detectors introduces to the market a range of both conventional fire detectors (M600) and analogue addressable type fire detectors (M900). In addition to the unobtrusive size and styled shape of the new range, the M900 analogue addresable series has a number of new design features, including smart card technology for setting the detector address, single visit to the ceiling installation and a service and maintenance detector park position.

## General

Included within the range in both M600 and M900 formats is the intelligent high performance optical smoke (H.P.O) detector. The use of the patented optical sensing chamber, together with refined signal processing, has enabled the introduction of a smoke detector suitable for fast, reliable smoke detection of both slow and fast developing fires.

The complete range has been designed to meet the requirements of BS (British Standards) and EN (European Standards) for fire detectors. The detectors also carry the new CE mark.

## M600 Series Conventional Detectors

The M600 Series provides the detector part of an automatic fire detection system, as defined in BS5839 pt1:1988. The M600 Series Conventional or two state detector is one that provides two output states to the controller, either "normal" or a "fire alarm" condition.

The detectors along with callpoints are grouped into fire zones, with each zone being connected to the control panel, by a separate two wire circuit and having a separate zone indicator on the panel.

## M900 Series Analogue Addressable

Unlike conventional style detectors where the detector carries out the "normal" or " fire alarm" decision with the M900 Series Analogue addressable fire detector, the detectors are acting as transducers relaying an output signal of the sensed phenomenon to the fire controller. The control unit then processes this information either in isolation, or in conjunction with information from other detectors to determine the appropriate response and ultimately make the decision whether or not to raise an alarm.

## Application

As each type of fire detector responds to a particular "fire product" the relative speed of response of the detector is therefore dependant upon the type of fire being detected. The range of M600 and M900 fire detectors have been designed to provide the earliest possible warning of a fire condition, with a minimum possibility of false/unwanted alarms.

As smoke is normally present at an early stage in most fires, smoke type detectors (high performance optical, optical and ion-chamber) are therefore considered the most useful. When considering the type of smoke detector for the application, the probable type of fuel for the fire should be considered, in general terms, fast developing fires are detected quicker with ion-chamber detectors, whereas with a slow developing fire an optical type smoke detector will respond quickest. But for general fire detection, where there is an equal possibility of either a "fast" or "slow" fire developing, the intelligent high performance optical detector provides an excellent detection response.

In situations where the installation of smoke detectors would cause an unacceptable level of false alarms (i.e. Kitchens, laundry areas) heat detectors may be installed. The M600 and M900 series provide a comprehensive selection of heat detectors, from Rate of Rise types to various fixed temperature.

Because of the wide variety of applications that fire detectors are expected to cover, it is recommended that reference to BS5839 Pt 1:1988 is made to aid selection.

## Fire Test Response

| Test Fire | Heat Developed | Smoke | Aerosol | Visible Portion | High Performance Optical | Optical | Ion-Chamber |
|---|---|---|---|---|---|---|---|
| TF1 Open Cellulosic fire (wood) | STRONG | YES | INVISIBLE | DARK | C | N | A |
| TF2 Smouldering Pyrolysis fire (wood) | NEGLIGIBLE | YES | VISIBLE | LIGHT | B | A | C |
| TF3 Glowing Smouldering fire (cotton) | NEGLIGIBLE | YES | INVISIBLE | LIGHT | B | A | B |
| TF4 Open Plastics fire (polyurethane) | STRONG | YES | INVISIBLE | VERY DARK | B | C | A |
| TF5 Liquid fire (n-heptane) | STRONG | YES | INVISIBLE | VERY DARK | B | C | B |
| TF6 Liquid fire (methylated spirits) | STRONG | NO | NONE | NONE | N | N | N |

**High Performance Optical Smoke MR601T and MR901T**

These detectors react to the whole range of fire products from slow smouldering fires, producing visible particles to open flaming fires producing large numbers of very hot smaller sized aerosols. It combines optical and heat detector technology to detect clear burning fire products which hitherto could only be easily detected by ion-chamber detectors.

For normal ambient conditions, the high performance optical detector behaves as a normal optical detector. Only when a rapid rise in temperature is detected does the sensitivity of the detector increase and the presence of smoke will confirm a fire condition which will be transmitted as an alarm level.

**Optical Smoke MR601 and MR901**

These detectors are capable of detecting the visible smoke produced by materials which smoulder or burn slowly, i.e. soft furnishings, plastic foam etc;. or 'smoke' produced by overheated but unburnt PVC.

These detectors are particularly suitable for general applications and areas where cable overheating may occur e.g. electrical services areas.

The novel design of the asymmetrical sampling chamber and signal processing techniques stop unwanted alarms caused by very small insects. i.e. thrips. Smoke entering the sampling chamber scatters the infra-red light pulses onto a photodiode These pulses are converted to an electrical signal which is compared against a preset alarm level or transmitted as an analogue value.

**Ion Chamber Smoke. MF601 and MF901**

These detectors react to the visible and invisible fire aerosols (products of combustion) and are therefore capable of detecting the early presence of hot smouldering and flaming fires, such as wood, paper etc.

They are particularly suitable for general applications in all areas and use a dual ionisation chamber in which the air is ionised by a single radioactive source (33k Bq Americium 241) The presence of smoke in the sampling chamber causes a change in the balance voltage, between the two chambers. This is then compared against an alarm level or converted to a current level and transmitted as an analogue value.

**Heat MD601, MD611 and MD901**

These detectors use two networked thermistors in a bridge configuration to provide a fast response, that depends both on absolute temperature and notes the change of temperature.

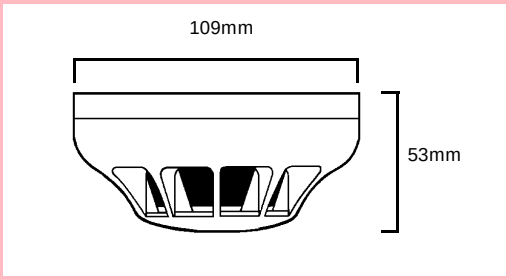
The rate of rise/fixed temperature heat detectors can be used in areas where smoke sensors are unsuitable due to environmental conditions (smoke, dust etc,). Such areas include kitchens, locker rooms, canteens, garages, loading bays etc.

The integral electronics emulate conventional fire detector's response curves and transmit the state to a controller as an alarm condition or as an analogue representation of the ambient temperature conditions.

# Technical Information

## Mechanical

| | |
|---|---|
| Detector Material: | FR110 “Bayblend” Fire resistant |
| Dimensions: | See diagram below |
| Weight (kg): | 0.2 detector and base approx |
| Colour: | White |




## Environmental

| | |
|---|---|
| Operating Temperature Range | -20°C to +70°C |
| Storage Temperature: | -25°C to + 80°C |
| Relative Humidity: | 95% non-condensing |

Note: Ion chamber radiation source - americum 241< 33.3 KBq

## Electrical

| | M600 Series | M900 Series |
|---|---|---|
| Supply Voltage: | 16 to 32 V d.c. | Determined by |
| Quiescent Current: | 60 µA typ. | controller |
| Alarm Current: | 48 mA typ. | |
| Reset time: | 2 - 5 seconds | |
| Wing Connections: | SEM Terminal<br>2 x 1.5mm$^2$ | SEM Terminal<br>2 x 1.5 mm$^2$ |

## Electromagnetic Compatibility

| | |
|---|---|
| ESD: | to IEC 801-2-1991, level 3 |
| Radiated:<br>Magnetic:<br>Fields: | to ENV50140 1993<br>10v/m @ 20 -1000 MHz<br>80% modulation @ 1KHz AM<br>1 Hz Pulse modulation |
| Fast transient: | to IEC801-4, level 3 |
| Slow High energy: | to ENV50142 1994 @ +/_1KV |