

# Discovery

## Ionisation Smoke Detector



### Product overview

<b>Product</b>	<b>Ionisation Smoke Detector</b>
<b>Part No.</b>	<b>58000-500</b>
<b>Digital Communication</b>	<b>Discovery (XP95 and CoreProtocol® compatible)</b>

### Conformance



### Product information

The Discovery Ionisation Smoke Detector uses a low activity radioactive foil to detect fires by irradiating the air in the smoke chambers causing a current flow. If smoke enters the chamber, the current flow is reduced leading to an alarm. The detector has a choice of five operating modes which are selected at the fire control panel.

- Responds well to fast burning, flaming fires
- Operates in a variety of environments
- Resilient to dust
- Five EN54 approved response modes
- Remote test feature

*Note: For system compatibility and feature support of this device, please refer to your chosen panel manufacturer.*

### Technical data

All data is supplied subject to change without notice. Specifications are typical at 24 V, 25°C and 50% RH unless otherwise stated.

<b>Detection principle</b>	Ionisation Chamber
<b>Chamber configuration</b>	Twin compensating chambers using one single sided Ionisation radiation source
<b>Radioactive Isotope</b>	Americium 241
<b>Activity</b>	33.3 kBq, 0.9 µCi
<b>Sampling frequency</b>	Continuous
<b>Supply Wiring</b>	Two wire supply, polarity insensitive
<b>Terminal functions</b>	L1 and L2 Supply in and out connections +R Remote indicator positive connection (internal 2.2 kΩ resistance to positive) -R Remote indicator negative connection (internal 2.2 kΩ resistance to negative)
<b>Digital communication protocol</b>	Discovery, (XP95 and CoreProtocol compatible)
<b>Modulation voltage</b>	5-9V peak to peak
<b>Operating voltage</b>	17 V - 28 V dc
<b>Quiescent current</b>	300µA
<b>Power-up surge current</b>	1mA
<b>Maximum power-up time</b>	10 seconds
<b>Alarm indicator</b>	Two red light emitting diodes (LEDs) Optional remote LED
<b>Alarm current LED illuminated</b>	3.5 mA
<b>Remote output characteristics</b>	Connects to positive line through 4.5 kΩ (5 mA maximum)
<b>Clean-air analogue value</b>	23 +/-0
<b>Alarm level analogue value</b>	55
<b>Operating temperature</b>	-30°C to +70°C
<b>Storage temperature</b>	-30°C to +80°C
<b>Humidity</b>	0% to 95% RH (no condensation or icing)
<b>Effect of temperature</b>	Less than 10% change in sensitivity over rated range
<b>Effect of atmospheric pressure</b>	Suitable for installation up to 2,000 m above sea level
<b>Effect of wind speed</b>	Less than 20% change in sensitivity at speeds up to 10 m/s. Note: slow changes in ambient conditions will automatically be compensated and will not affect sensitivity
<b>Vibration, impact and shock</b>	EN 54-7
<b>IP Rating</b>	IP44
<b>Standards and approvals</b>	EN 54-7, CPR, LPCB, VdS, BOSEC, BFS, SBSC, FG, Kazakhstan
<b>Dimensions</b>	100 mm diameter x 42 mm height
<b>Weight</b>	105 g
<b>Materials</b>	Housing: White flame-retardant polycarbonate Terminals: Nickel plated stainless steel

## Operation

The Discovery Ionisation Smoke Detector uses the same outer case as the optical smoke detector and is distinguished by the red indicator LEDs. Inside the case is a printed circuit board which has the ionisation chamber mounted on one side and the signal processing and communications electronics on the other.

The ionisation chamber consists of a reference chamber contained inside a smoke chamber. The outer smoke chamber has inlet apertures fitted with insect repellent mesh. At the junction between reference and smoke chambers the sensing electrode converts variations in chamber current into voltage changes.

When smoke particles enter the ionisation chamber ions become attached to them with the result that the current flowing through the chamber decreases. This effect is greater in the smoke chamber than the reference chamber and the imbalance causes the sensing electrode to become more positive.

The analogue voltage at the sensor electrode is converted into a digital format which is processed to provide an analogue value for transmission to the fire control panel when the device is polled.

## Environmental characteristics

The Discovery Ionisation Smoke Detector like all ionisation detectors has some sensitivity to air movement (wind). The extent to which the analogue value will change depends on the wind speed and on the orientation of the detector relative to the wind direction. Relatively small changes in wind direction can cause significant changes in analogue value.

For wind speeds up to one metre per second (200ft/min) sensitivity will change by less than 20%. Continuous operation in wind speeds greater than two metres per second (400 ft/min) is not recommended. However, wind speeds of up to 10 m/s can be tolerated for short periods and will not under any conditions increase the probability of false alarms.

## Features

### Response modes

Discovery Ionisation Smoke Detectors can be operated in any one of five EN54 approved response modes, which can be selected through the fire control panel. Each mode corresponds to a unique response behaviour, which is related to sensitivity to fire. Mode 1 gives a higher sensitivity to fire than Mode 5.

### Discovery Ionisation Smoke Detector operating modes

Mode	Alarm threshold y value	Minimum time to alarm (secs)
1	0.45	5
2	0.45	30
3	0.70	5
4	0.70	30
5	1.0	5

Compensation rate complies with EN54-7

## Flashing LEDs

Discovery Ionisation Smoke Detectors have two integral LED indicators, which can be illuminated at any time by the fire control panel to indicate detectors in alarm. A flashing LED mode can also be programmed to activate each time a detector is polled.

## Remote test feature

The remote test feature is enabled from the fire control panel. On receipt of the command signal from the fire control panel, the detector is forced electrically into alarm. An analogue value of 85 is returned to the fire control panel to indicate that the detector is working correctly.

## Rejection of transient signals

Discovery detectors are designed to give low sensitivity to very rapid changes in the sensor output, since these are unlikely to be caused by real fire conditions, resulting in fewer false alarms.

## Drift compensation

Discovery Ionisation Smoke Detectors include compensation for signal drift to compensate for changes in the sensor output caused, for example by dust in the chamber, and will therefore hold the sensitivity at a constant level even with severe chamber contamination. This increased stability is achieved without significantly affecting the detectors sensitivity to fire whilst still meeting the requirements of the EN54 standard.

## EMC Directive 2014/30/EU

The Discovery Ionisation Smoke Detector complies with the essential requirements of the EMC Directive 2014/30/EU provided that it is used as described in this data sheet.

A copy of the Declaration of Conformity is available from the Apollo website: [www.apollo-fire.co.uk](http://www.apollo-fire.co.uk)

Conformity of the Discovery Ionisation Smoke Detector with the EMC Directive, does not confer compliance with the directive on any apparatus or systems connected to them.

## Construction Products Regulation 305/2011/EU

The Discovery Ionisation Smoke Detector complies with the essential requirements of the Construction Products Regulation 305/2011/EU.

A copy of the Declaration of Performance is available from the Apollo website: [www.apollo-fire.co.uk](http://www.apollo-fire.co.uk)

 **Safety note**

In the United Kingdom ionisation smoke detectors are subject to the requirements of the Environmental Permitting Regulations 2016 and to the Ionising Radiations Regulations 1999 made under the provisions of the Health and Safety at Work etc. Act 1974.

The detectors, independently tested by the Health Protection Agency (HPA), conform to all the requirements specified in the 'Recommendations for ionisation smoke detectors in implementation of radiation standards' published by the Nuclear Energy Agency of the Organisation for Economic Co-operation and Development (OECD) 1977.

There is no limit to the number of ionisation smoke detectors which may be installed in any fire protection system.

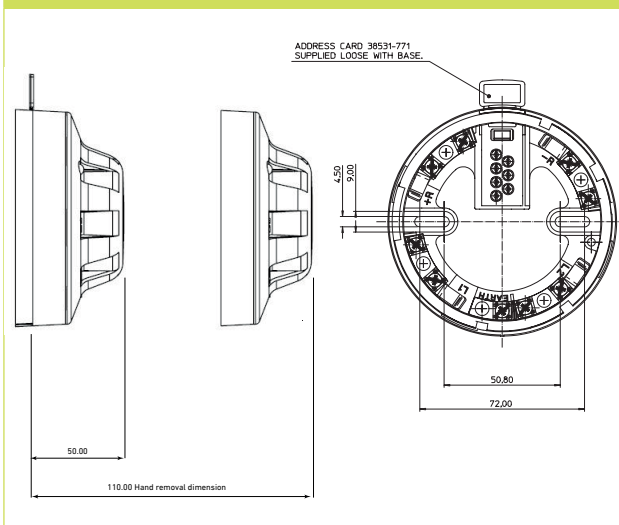
Storage regulations depend upon local standards and legislation, but in the UK, up to 500 detectors may be stored in any premises, although there are stipulations on storage facilities if more than 100 ionisation detectors are stored in one building.

**At the end of their recommended working life of ten years ionisation smoke detectors should be returned to Apollo for safe disposal.**

Guidance on storage and handling can be given by Apollo Fire Detectors and full details can be requested from:

The Environment Agency,  
National Customer Contact Centre,  
PO Box 544,  
Rotherham,  
S60 1BY

Outside the UK, please contact the relevant national agency.

**Discovery Ionisation Smoke Detector dimensions**

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