

# XP95 I.S. Ionisation Smoke Detector



## Technical data

All data is supplied subject to change without notice. Specifications are typical at 24 V, 23°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>Sensitivity</b>           | Nominal threshold $\gamma$ value of 0.7 to EN 54-7   |
| <b>Supply Wiring</b>         | Two wire supply, polarity sensitive  |
| <b>Terminal functions</b>    | L1 Positive supply<br>L2 Negative supply and remote LED negative<br>+R Remote LED positive |

### Notes:

1. I.S. detectors are polarity sensitive
2. There is no requirement for series resistance on remote LED lines.
3. The remote LED characteristic differs from XP95

|  |  |
|--|--|
| <b>Supply voltage</b>  | 14 V to 22 V dc  |
| <b>Modulation voltage at detector</b>                          | 5-9 V peak to peak   |
| <b>Quiescent current</b>                                       | 300 µA   |
| <b>Power-up surge current</b>                                  | 1 mA   |
| <b>Duration of power-up surge current</b>                      | 0.3 seconds  |
| <b>Maximum power-up time</b>                                   | 4 seconds for communications (measured from application of power and protocol)<br>10 seconds to exceed 10 counts for 15 seconds for stable clean air value |
| <b>Clean air analogue value</b>                                | 25 ± 7 counts  |
| <b>Alarm level 55 counts</b>                                   | EN 54 $\gamma$ value of 0.7  |
| <b>Alarm indicator</b>   | Red light emitting diode (LED)   |
| <b>Alarm LED current</b>                                       | 2 mA   |
| <b>Remote LED current</b>                                      | 1 mA (internally limited)  |
| <b>Storage temperature</b>                                     | -30°C to +80°C   |
| <b>Operating temperature</b>                                   | -20°C to +40°C (T5)<br>-20°C to +60°C (T4)   |
| <b>Guaranteed temperature range (no condensation or icing)</b> | -20°C to +60°C   |
| <b>Effect of atmospheric pressure</b>                          | Automatic compensation by dual chambers to maintain sensitivity up to a height of 2000 m above sea level   |
| <b>Effect of wind speed</b>                                    | 10m/s maximum  |
| <b>Vibration, impact &amp; shock</b>                           | EN 54-7  |
| <b>IP Rating</b>   | IP23D  |
| <b>Standards &amp; approvals</b>                               | EN54, MED, LR, BV, ABS, KRS, VdS, UL, CCCF, BOSEC, SBSC, BfS, FM, IECEx, ATEX and BASEEFA  |
| <b>Dimensions</b>  | 100mm diameter x 42 mm height (50 mm height with mounting base)  |
| <b>Weight</b>  | 105 g (161 g with mounting base)   |
| <b>Materials</b>   | Housing: White flame-retardant polycarbonate<br>Terminals: Nickel plated stainless steel   |

## Product overview

|                 |                                |
|-----------------|--------------------------------|
| <b>Product</b>  | I.S. Ionisation Smoke Detector |
| <b>Part No.</b> | 55000-540                      |

## Approvals



## Product information

The XP95 Intrinsically Safe (I.S.) 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.

- Responds well to fast burning, flaming fires
- Operates in a variety of environments
- Minimal effects from temperature, humidity and atmospheric pressure

## Operation

The XP95 I.S. Ionisation Smoke Detector has a moulded self-extinguishing polycarbonate casing with wind resistant smoke inlets. Inside the detector is a printed circuit board that has the ionisation chamber mounted on one side and the address capture, signal processing and communications electronics on the other.

The ionisation chamber system is an inner reference chamber contained inside an outer smoke chamber. The outer smoke chamber has smoke inlet apertures that are fitted with an insect resistant mesh.

The radioactive source holder and the outer smoke chamber are the positive and negative electrodes respectively. An Americium 241 radioactive source mounted within the inner reference chamber irradiates the air in both chambers to produce positive and negative ions. On applying a voltage across these electrodes an electric field is formed. The ions are attracted to the electrode of the opposite sign, some ions collide and recombine, but the net result is that a small electric current flows between the electrodes. At the junction between the reference and smoke chambers is the sensing electrode that is used to convert variations in the chamber currents into a voltage.

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

The voltage on the sensing electrode is monitored by the sensor electronics and is processed to produce a signal that is translated by the analogue/digital converter in the communications ASIC ready for transmission when the device is interrogated.

## Electrical description

The Ionisation Smoke Detector is designed to be connected to a two wire loop circuit carrying both data and a 14 V to 22 V dc supply. The detector is connected to the incoming and outgoing supply via terminals L1 and L2 in the mounting base. A remote LED indicator requiring not more than 1mA may be connected between the +R and L2 terminals. An earth connection terminal is also provided. The detector is calibrated to give an analogue value of  $25 \pm 7$  counts in clean air. This value increases with smoke density. A count of 55 corresponds to the EN alarm sensitivity level.

## Environmental characteristics

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 (440 ft/min) is not recommended. However, wind speeds up to 10 metres per second can be tolerated for short periods and will not under any conditions increase the probability of false alarms.



### 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.

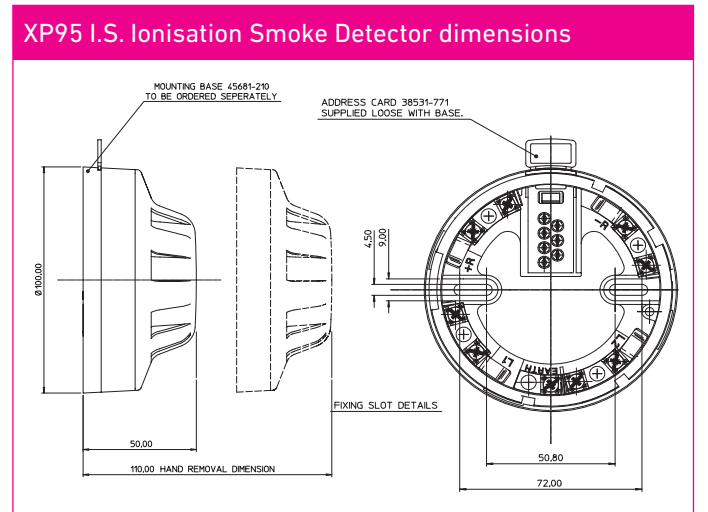
Storage regulations depend upon local standards and legislation, but in the UK, up to 500 detectors may be stored in any premises, although there are stipulations on storage facilities if more than 100 ionisation detectors are stored in one building.

**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.



## EMC Directive 2014/30/EU

The XP95 I.S. 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 Apollo upon request.

## Construction Products Regulation 305/2011/EU

The XP95 I.S. 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 Apollo upon request.

## Marine Equipment Directive 2014/90/EU

The XP95 I.S. Ionisation Smoke Detector complies with the essential requirements of the Marine Equipment Directive 2014/90/EU.