

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.

Detection principle	Ionisation Chamber
Chamber configuration	Twin compensating chambers using one single sided Ionisation radiation source
Radioactive Isotope	Americium 241
Activity	33.3 kBq, 0.9 µCi
Sampling frequency	Continuous
Sensitivity	Nominal threshold γ value of 0.7 to EN 54-7
Supply Wiring	Two wire supply, polarity sensitive
Terminal functions	L1 Positive supply L2 Negative supply and remote LED negative +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

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

Product overview

Product	I.S. Ionisation Smoke Detector
Part No.	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±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.

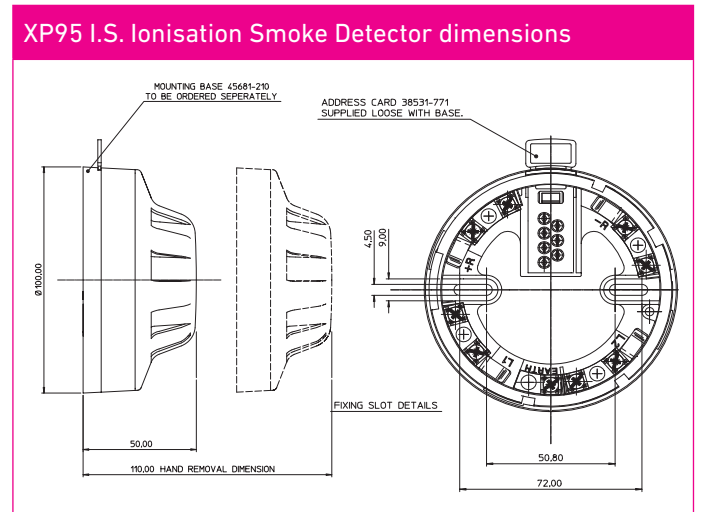
Storage regulations depend upon local standards and legislation, but in the UK, up to 500 detectors may be stored in any premises, although there are stipulations on storage facilities if more than 100 ionisation detectors are stored in one building.

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.