XP95A
Ionization Smoke Detector

Product overview

Product	Ionization Smoke Detector
Part No.	55000-550
Digital Communication	XP95, Discovery and CoreProtocol® compatible

Compliance

Product information

The XP95A Ionization 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

Technical data

All data is supplied subject to change without notice. Specifications are typical at 24V, 73°F and 50% RH unless otherwise stated.

Detection principle	Ionization Chamber
Chamber configuration	Twin compensating chambers using one single sided Ionization radiation source
Radioactive Isotope	0.9 µCi Americium 241
Sampling frequency	Continuous
Sensitivity	1.1 + 0.5 %/ft
Digital communication protocol	XP95, Discovery and CoreProtocol compatible
Operating voltage	17 - 28 V dc
Modulation voltage	5–9 V peak to peak
Supervisory current	500 µA peak
Surge current	1 mA
Alarm LED current	2.5 mA
Maximum ambient installation temperature	100°F
Operating temperature range	32 °F to 100 °F
Air velocity	0 - 300 fpm
Humidity	0% to 95% RH (no condensation or icing)
Standards and approvals	UL, ULC, FM, CSFM and MSFM
Dimensions	3.93" diameter x 1.65" height
Weight	3.70 oz
Materials	Housing: White flame-retardant polycarbonate Terminals: Nickel plated stainless steel
Test method	Home safeguard Gemini 501
Spacing	Install as per NFPA72 and local requirements. on smooth, flat ceilings, spacing of 30 feet may be used as a guide.

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Operation

The XP95A Ionization 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 ionization chamber mounted on one side and the address capture, signal processing and communications electronics on the other.

The ionization 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 ionization chamber ions become attached to them with the result that the current flowing through the ionization 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.

Environmental characteristics

The XP95A Ionization Smoke Detector like all ionization 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.

Electrical description

The XP95A Ionization Smoke Detector is designed to be connected to a two wire loop circuit carrying both data and a 17 V to 28 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 4 mA at 5 V may be connected between the +R and –R 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.

XP95A Ionization Smoke Detector diagram
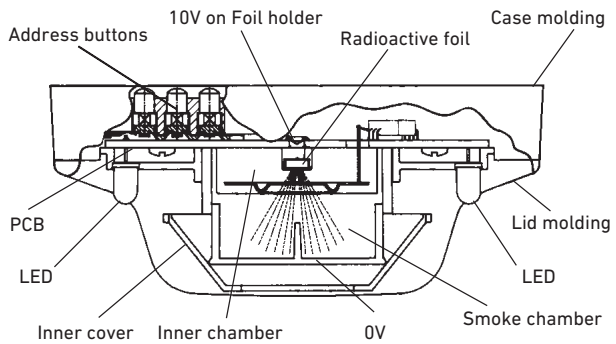
Safety note

At the end of their recommended working life of ten years ionisation smoke detectors should either be returned to Apollo for safe disposal, or disposed of in accordance with local regulations.