



Model FB-7254G
Ionization Smoke Detector
Addressable FB-AP Series®
Product Overview

Overview

The FB-AP Series® Ionization smoke detector is a good general purpose unit that responds well to fast burning, flaming fires.

It has a molded white polycarbonate case with wind-resistant smoke inlets. Inside the case is a printed circuit board which has the ionization chamber mounted on one side and the signal processing and communications electronics on the other. The ionization chamber consists of a reference chamber contained inside a smoke chamber (Figure 1). The outer smoke chamber has inlet apertures fitted with insect resistant mesh.

The radioactive source holder and the smoke chamber form positive and negative electrodes respectively. An Americium 241 radioactive source mounted within the reference chamber irradiates the air in both chambers, producing positive and negative ions. A voltage across the electrodes produces an electric field. Ions are attracted to the electrode of the opposite sign to their own charge; many recombine but a small electric current flows between the electrodes. 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 in the reference chamber, and the imbalance causes the sensing electrode to become more positive. The analog voltage at the sensor electrode is converted to a digital format which is processed to provide an analog value for transmission to the Fire Alarm Control Panel (FACP) and then on to the logic solver when the device is polled.

The FB-AP Series™ Ionization detector, like all ionization detectors, has some sensitivity to air movement (wind). The extent to which the analog 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 analog value.

For wind speeds up to 200ft/min (1m/s) the change in analog value will not exceed 5 counts. Continuous operation in wind speeds greater than 400ft/min (2m/s) is not recommended. However, wind speeds up to 2000ft/min (10m/s) can be tolerated for short periods and will not under any conditions increase the probability of false alarms.

Ionization smoke detectors are supplied in individual packing with a red lid serving as a dust cover which can be left in place after fitting to prevent ingress of foreign material until commissioning of the system takes place. At this point the covers must be removed.

Mode	Alarm Threshold & Value	Minimum Time to alarm (sec)
1	0.45	5
2	0.45	30
3	0.7	5
4	0.7	30
5	1	5

Table 1 - Ionization detector operating modes

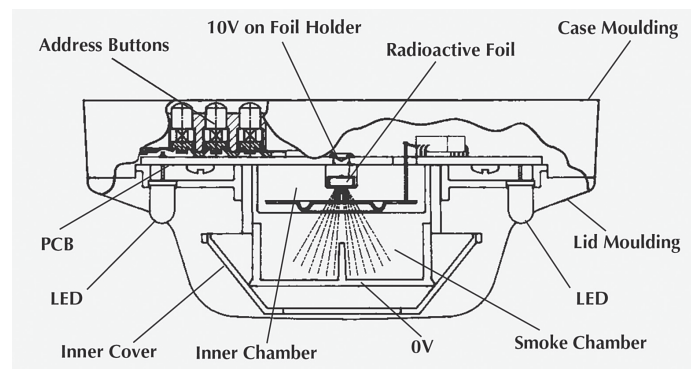


Figure 1 - Sectional view of Ionization detector

<p>FB-AP Series® Ionization Smoke Detector Part No 7254-FBD-8550</p> <p>Specifications are typical at 24V, 72°F (23°C) and 50% relative humidity unless otherwise stated.</p> <p>Detection principle: Ionization chamber</p> <p>Chamber configuration: Twin compensating chambers using one single sided ionizing radiation source</p> <p>Radioactive isotope: Americium 241</p> <p>Activity: 33.3 kBq, 0.9µCi</p> <p>Type code: Bits 2 1 0 4 3 7 6 5 0 1 1 0 0 0 0 0</p> <p>Supply wiring: Two-wire supply, polarity insensitive</p>	<p>Terminal functions: L1 & L2 supply in and out connections.</p> <p>+R Remote indicator positive connection (internal 2.2kΩ resistance to positive)</p> <p>-R remote indicator negative connection (internal 2.2kΩ resistance to negative)</p> <p>Operating voltage: 17–28V DC</p> <p>Communication protocol: FireBus-AP™ 5–9V peak to peak</p> <p>Quiescent current: 500µA average 750µA peak</p> <p>Power-up surge current: 1mA</p> <p>Maximum power-up time: 10s</p> <p>Alarm current: LED illuminated: 3.5mA</p> <p>Remote output characteristics: Connects to positive line through 4.5kΩ (5mA maximum).</p>	<p>Clean-air analog value: 23 +4/-0</p> <p>Alarm level analog value: 55</p> <p>Alarm indicator: 2 red Light Emitting Diodes (LEDs). Optional remote LED</p> <p>EMI/RFI compatibility: CE marked, A copy of the relevant declaration is available on request.</p> <p>Temperature range: Max. continuous operating 140°F (60°C) Min. continuous operating 32°F (0° C) Min. operating -4°F (-20°C) (no condensation/icing)</p> <p>Storage -22°F to +176°F (-30°C to +80°C)</p> <p>Humidity: 0 to 95% relative humidity (no condensation)</p> <p>Effect of temperature: Less than 10% change in sensitivity over rated range.</p>	<p>Atmospheric pressure: Storage: If air freighted, this product should be placed in a pressurised hold. Operating: Suitable for installation up to 2,000ft above sea level.</p> <p>Effect of wind: Less than 20% change in sensitivity at speeds up to 2000 ft/min (10m/s)</p> <p>Note: slow changes in ambient conditions will automatically be compensated and will not affect sensitivity</p> <p>Vibration, Impact and Shock: To EN54-7:2000</p> <p>IP rating: 43</p> <p>Dimensions: 4in (100mm) diameter; 1.6in (42mm) height 2in (50mm) (in base)</p> <p>Weight: Detector 3.7oz (105g) Detector in base 5.6oz (160g)</p> <p>Materials: Housing: White polycarbonate V-0 rated to UL94</p> <p>Terminals: Nickel plated stainless steel</p>
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Ordering Information

Detector:

7254-FBD-8550 Ionization Smoke Detector

Compatible Bases

- 7254-FBD-4210 Detector Base, 4"
- 7254-FBD-4225 Detector Base, 6"
- 7254-FBD-4234 Detector Base, Low Profile, 6"
- 7254-FBD-4242 Detector Base, Low Power Relay, 4"
- 7254-FBD-4250 Detector Base, E-Z Fit, 6"

Accessories:

7254-FBD-4400 Blank XPert Card.

