



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

Overview

The FB-AP Series® Multisensor detector combines optical smoke and thermistor temperature sensors in one unit which is useful over a wide range of applications and is highly immune to false alarms.

The two sensors outputs are combined to give the final analog value. The way in which the signals from the two sensors are combined depends on the response mode selected. The five modes provide response behavior which incorporates pure heat detection, pure smoke detection and a combination of both. The multisensor is therefore useful over the widest range of applications.

The multisensor construction is similar to that of the optical detector but uses a different lid and optical moldings to accommodate the thermistor temperature sensor. The sectional view (Fig 1) shows the arrangement of the optical chamber and the thermistor. The signals from the optical smoke sensing element and the temperature sensor are independent, and represent the smoke level and the air temperature respectively in the vicinity of the detector.

The detector's microcontroller processes the two signals according to the mode selected. When the detector is operating as a multisensor (i.e. modes 1, 3 and 4) the temperature signal processing extracts only rate-of-rise information for combination with the optical signal. In these modes the detector will not respond to a slow temperature increase – even if the temperature reaches a high level. A large sudden change in temperature can, however, cause an alarm without the presence of smoke, if sustained for 20 seconds. The processing algorithms in modes 1 to 4 incorporate drift compensation. The characteristics of the five response modes are summarized as follows.

Mode 1 has very high smoke sensitivity combined with high temperature sensitivity. This gives a high overall sensitivity to both smoldering and flaming fires.

Mode 2 has a smoke sensitivity similar to that of a normal optical smoke detector but has no response to temperature. This mode is therefore equivalent to a standard optical detector. It is suitable for applications where there are normally wide temperature changes.



Mode 3 has both moderate smoke and heat sensitivity. This combination is considered the optimum for most general applications since it offers good response to both smoldering and flaming fires.

Mode 4 has lower than normal smoke sensitivity combined with high heat sensitivity. This makes it suitable for applications in which a certain amount of fumes or smoke is considered normal.

Mode 5 has no smoke sensitivity at all, but gives a pure heat detector response. In this mode the detector will respond to slowly changing temperatures and has a “fixed temperature” alarm threshold at 136°F (58°C). The analog value in this mode will give the approximate air temperature over the range 60°F to 130°F (15°C to 55°C) and the smoke sensor is still active though it does not contribute to the analog signal. Due to this, if the detector is used in a dirty or smoky environment the optical sensor drift flag may be activated in the heat-only mode.

Note: in situ testing of the multisensor detector should be carried out as for smoke detectors in response modes 1-4 and for heat detectors in response modes 5.

Design Note: if the multisensor is to be used in mode 5, heat detector spacing/coverage should be applied.

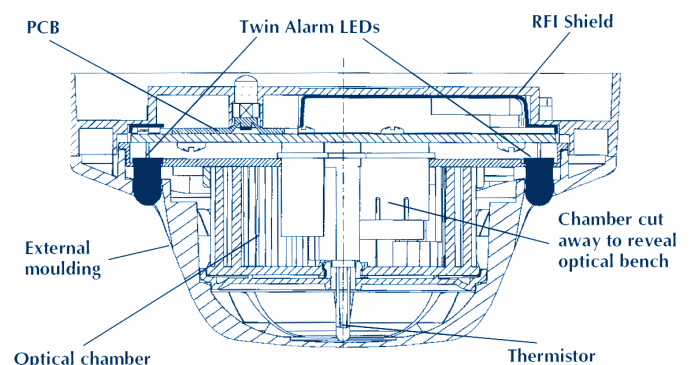


Figure 1 - Sectional view of Multisensor detector

<p>FB-AP Series® Multisensor Detector Part No 7254-FBD-8750</p> <p>Specifications are typical at 24V, 72°F (23°C) and 50% relative humidity unless otherwise stated.</p> <p>Detection principle: Smoke: Photo-electric detection of light scattered by smoke particles</p> <p>Heat: Temperature-sensitive resistance.</p> <p>Type code: Bits 2 1 0 4 3 7 6 5 1 0 1 1 1 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 colorless 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 on optical sensor: Less than 15% change in sensitivity over rated range, slow changes in ambient conditions will automatically be compensated and will not affect sensitivity.</p> <p>Effect of atmospheric pressure on optical sensor: None.</p> <p>Effect of wind on optical sensor: None.</p> <p>Vibration, Impact and Shock: To EN54–7:2000</p>	<p>IP rating: 43</p> <p>Dimensions: 4in (100mm) diameter; 2in (50mm) height 2.3in (58mm) (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> <p>Smoke element only:</p> <p>Chamber configuration: Horizontal optical bench housing infra-red emitter and sensor, arranged radially to detect forward scattered light.</p> <p>Sensor: Silicon PIN photo-diode</p> <p>Emitter: GaAlAs infra-red light emitting diode</p> <p>Sampling frequency: 1 per second</p>
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Ordering Information

Detector:
7254-FBD-8750 MultiSensor 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.

