



F220 Photoelectric Smoke Detectors



The F220 Photoelectric Smoke Detectors are UL Listed, open-area photoelectric smoke detectors. Use them with commercial fire protective signaling systems and household fire warning systems (see NFPA 72, the National Fire Alarm Code). These smoke detectors scatter light using a pulsed infrared source operating with a gated, high-speed, photodiode infrared sensor. The symmetry of the optical chamber allows 360° uniform smoke entry, but minimizes external light entry. By using low current electronic circuitry, you can connect the detectors to a wide range of power source circuits.

Functions

Compatible Bases

Configure the detectors into two-wire or four-wire versions by selecting the appropriate mounting base. These detectors are compatible with any of the F220-B6 bases:

- F220-B6 Two-wire Mounting Base
- F220-B6R Standard Four-wire Mounting Base
- F220-B6RS Four-wire Mounting Base with Sounder
- F220-B6C Four-wire Mounting Base with Auxiliary Relay
- F220-B6E Power Supervision Mounting Base
- F220-B6PM Addressable Master Base

- ▶ Two-wire or four-wire bases
- ▶ Use with 12 VDC or 24 VDC systems
- ▶ 30 ft (9 m) spacing between detectors
- ▶ Optional CO-sensor, heat-sensor enhanced detection chamber
- ▶ Clean chamber without removal or disassembly
- ▶ CleanMe® signaling capability
- ▶ Sensitivity readout on detector
- ▶ Detector chamber compensates for dust build-up
- ▶ Tamper protection
- ▶ Dual-color LED

- F220-B6PS Addressable Base

Monitoring the Detection Chamber

These detectors have several features that work together to maximize the performance of the optical chamber:

- **Compensation:** The detector monitors the chamber for the effects of dust build-up within the chamber and automatically compensates for these effects. If the chamber becomes contaminated beyond its ability to compensate, the green LED flashes every 4 sec to indicate trouble.
- **Chamber Check® Self-diagnostics:** The detector automatically indicates visually if the calibration is out of the factory-listed range. This meets NFPA guidelines for sensitivity testing, because you can visually inspect the detector and check the flash rate of the LED. If the calibration is out of range, the green LED on the detector flashes once every 4 sec. This indicates that the detector must be cleaned following the instructions provided with the detector.
- **CleanMe Mode:** Indicates if the calibration is out of the factory-listed range by sending a trouble signal to the CleanMe-compatible control panel, if so programmed.

- **Chambermaid™:** The detector has a unique, patent-pending cleaning mechanism. Use the valve on the back of the detector to insert the nozzle of a can of clean, dry compressed air. Clean the chamber with a short (1 to 2 sec) blast of air.

Heat and Carbon Monoxide Enhancements

The detectors are available with an optional fixed-temperature heat sensor, a carbon monoxide (CO) sensor, or a combination of heat and CO sensors. These optional sensors enhance the operation of the smoke detector by reducing false alarms.

- **Carbon Monoxide:** Without the presence of CO, a normal byproduct of combustion, the detection chamber is half as sensitive to smoke as a standard commercial photoelectric smoke chamber. This reduces false alarms. When the sensor detects CO, the detection chamber's sensitivity to smoke increases so it equals or exceeds that of a standard commercial photoelectric smoke chamber.
- **Heat:** When the heat sensor detects a temperature rise, the photoelectric chamber becomes more smoke sensitive. The heat sensor initiates an alarm if the ambient temperature exceeds +135°F (+57°C).

Dual-color LED

A dual-color LED indicator flashes green every 8 sec when the detector has power and the smoke sampling circuitry is working. If CleanMe is enabled, the green LED double flashes (two flashes a half second apart) every 8 sec to indicate normal operation. The LED turns red if an alarm is sent. After the alarm condition clears, reset the detector by interrupting its power. If the chamber becomes contaminated beyond its ability to compensate, the green LED flashes every 4 sec to indicate trouble.

Test Functions

The F220 Photoelectric Smoke Detectors feature a unique magnet operation and sensitivity test function. Test the detector's operation by placing the magnet next to the detector's LED for three consecutive flashes. This causes the detector to send an alarm. Placing a magnet next to the detector's LED for at least one red flash but less than three flashes activates the detector's sensitivity mode.

Tamper Detection

When detector heads are correctly installed in any of the F220-B6 bases, the positive power line provides tamper detection. The control panel initiates a trouble signal if a detector is removed from its base. A mechanical

tamper lock comes with each base to prevent unauthorized head removal.

Certifications and Approvals

Listings and:	UL UROX: Smoke – Automatic Fire Detectors (UL268)
Approvals:	UL UROX7: Smoke – Automatic Fire Detectors certified for Canada (ULC-S529-02)
	P/PTH Detector Heads: CSFM 7272-1615: 106
	PTHC Detector Head: CSFM 7272-1615: 107
	F220-B6/B6C/B6E/B6R Detector Bases: CSFM 7300-1615: 105
	F220-B6PM/PS Detector Bases: CSFM 7300-1615: 215
	Factory Mutual Research
	Hong Kong Fire Services Department
	NYC/MEA (117-05-E)

Installation/Configuration Notes

Compatible Control Panels

- **Two-wire:** Bosch Security Systems makes no claim written, oral, or implied that the F220 Photoelectric Smoke Detectors work with any two-wire control panels except those specified in the Control Panel Compatibility chart in the *Technical Service Note* (P/N: 4998148185).
- **Four-wire:** Compatible with all UL Listed four-wire control panels. Refer to the manufacturer's installation instructions for proper end-of-line (EOL) resistor selection.

Mounting the Bases

Note Consult NFPA 72 for proper detector placement.

Depending on local regulations, the bases can be surface mounted directly on four-inch square or octagonal electrical boxes and single-gang switch boxes.

Note The volume of any electrical box used should be large enough to accommodate the number and size of conductors as specified by the National Electrical Code or any local authorities having jurisdiction (AHJ).

Loop Supervision

Loop supervision requires one D275 or F220-B6E per loop when using F220-B6R/B6C bases and is supervised by the control panel.

Wiring the Bases

Refer to the *F220 Series Installation Instructions*

(P/N: 4998138694) or the *F220-B6PS/M Installation Instructions* (P/N: 4998149982) for detailed wiring instructions.

Technical Specifications

Environmental Considerations

Relative Humidity:	0% to 95% non-condensing 15% to 95% non-condensing for CO sensing models
Temperature (normal operating):	+32°F to +100°F (0°C to +38°C)

Mechanical Properties

Color:	White
Dimensions (diameter x H):	6.75 in. x 2.25 in. (17.1 cm x 6.4 cm)

Power Requirements

Current (alarm): (detector head only)	20 mA minimum at 8.5 VDC; 35 mA maximum at 32 VDC
Current (start-Up):	0.12 mA maximum at 32 VDC
Maximum RMS Ripple:	25% of DC input
Power-up Time:	22 seconds maximum
Voltage (standby):	Two-wire: 8.5 VDC to 32.0 VDC Four-wire: 10.0 VDC to 30.0 VDC

Trademarks

Chamber Check® is a registered trademark of Bosch Security Systems in the United States.

Chambermaid™ is a trademark of Bosch Security Systems in the United States.

CleanMe® is a registered trademark of GE Interlogix in the United States and/or other countries.

Ordering Information

F220-PTHC Photoelectric Smoke Detector with +135°F (+57°C) Heat and Carbon Monoxide Sensors F220-PTHC

F220-P Photoelectric Smoke Detector F220-P

F220-PTH Photoelectric Smoke Detector with +135°F (+57°C) Heat Sensor F220-PTH

F220-PTH Photoelectric Smoke Detector with +135°F (+57°C) Heat Sensor

Hardware Accessories

D275 Power Supervision Module	D275
DRA-5 Remote Alarm Indicator	DRA-5
DT-2 Detector Removal Tool	DT-2
F220-B6 Two-wire Base	F220-B6
F220-B6R Standard Four-wire Base	F220-B6R
F220-B6RS Conventional Detector Base with Sounder	F220-B6RS
F220-B6C Four-wire Base with Auxiliary Form C Relay	F220-B6C
F220-B6E Power Supervision Base with End-of-line Power Monitoring Relay	F220-B6E
F220-B6PM Addressable Master Base	F220-B6PM
F220-B6PS Addressable Base	F220-B6PS

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