BOSCH
Invented for life

FCP-500 Conventional Flush-mount Smoke Detectors

- **Modern, ultra-low profile design**
- **Color inserts match the surrounding decor**
- **Smooth, easily-cleaned detector surface**
- **Innovative retention mechanism**
- **High reliability**
- **Four-wire technology (six-conductor wire)**
- **Compatible with 12 VDC or 24 VDC systems**
- **30 ft (9 m) spacing between detectors**
- **Optional carbon monoxide (CO) sensor for false alarm reduction**
- **Dual color LED**

The FCP-500 Conventional Flush-mount 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).

The FCP-500 is available as a photoelectric smoke detector or as a multi-sensor detector with an additional carbon monoxide (CO) sensor. The detectors are ideal for areas where increased levels of dust and fibers are expected. Each type is offered in white or transparent with color inserts.

The FCP-500 series smoke detectors satisfy the most demanding aesthetic requirements. Their ultra-low profile design offers flush ceiling mounting. The detectors and covers in the P versions are supplied with reversible printed color rings in 32 colors for individual color matching.

Functions

Sensor Technology and Signal Processing

All detectors in the FCP-500 series are equipped with two optical sensors and a contamination sensor. The FCP-500-C multi-sensor detector also has a CO sensor.

All sensor signals are constantly analyzed by the internal signal electronics through specially developed algorithms.

Multiple criteria optical sensors with the CO sensor results in an extremely high tolerance to unwanted alarms. Consequently, the detector can be used in areas with small amounts of non-fire-related smoke, steam, or dust.

Optical (Smoke) Sensor (all models)

The optical sensor operates according to the scattered light method.

The LEDs transmit pulsed infrared light at a defined angle into the scattered light area. If a fire occurs, the light is scattered by the smoke particles and strikes the photo diodes that transform the quantity of light into a proportional electrical signal.

Interference effects from daylight and lighting sources are filtered out with an optical daylight filter and by using electronic filtering and rectification algorithms.

The detector's various diodes (infrared and photo) are individually controlled by the detector's electronics. Independent signal combinations are produced that are ideal for detecting smoke. This makes it possible to differentiate between smoke and interference agents (insects, objects). In addition, the detector's algorithm checks the plausibility of the timing and correlation of sensor signals. This makes it possible to detect errors in the signal electronics or the LEDs.

CO sensor (C models only)

Note The CO sensor is for detection enhancement only. It is not a CO detector and cannot activate an alarm in the presence of CO only.

Without the presence of CO, the smoke sensor is half as sensitive to smoke as a standard commercial photoelectric smoke detector. This reduces false alarms. When the sensor detects CO, the detection chamber's sensitivity to smoke increases so it is equal to that of a standard commercial photoelectric smoke chamber.

Contamination Sensor (all models)

The degree of contamination on the detector surface or a blockage of the detector is continually measured by the contamination (antimask) sensor. Heavy contamination of the detector surface or a blockage causes a fault indication.

Additional Performance Features

- A clearly visible two-color LED indicates various operating states:
  - A green LED flashes every 8 seconds when the detector has power and the smoke sampling circuitry is working.
  - A green double flash every 8 seconds indicates a trouble.
  - A green flash every second indicates that the detector is in test mode. This test mode, that checks the physical function of the optical and CO sensors, starts by activating the detector's dry reed contact with a magnet for at least 2 sec but not more than 4 sec.
- Perform an electrical function test by activating the dry reed contact for more than 10 sec. The detector activates an alarm and the LED turns red.
- An external alarm LED indicator can be connected.
- The innovative detector lock operates on a click and lock principle to provide fast and simple insertion and replacement of the detector. Use the specially developed FAA-500-RTL Removal Tool, especially for high mounting heights.
- Convenient detector testing is available with the FAA-500-TTL Test Adapter with Magnet.

Certifications and Approvals

Region	Certification	
USA	UL	UROX: Smoke - Automatic Fire Detectors (UL268 and A), UROX7: Smoke - Automatic Fire Detectors Certified for Canada (c-UL-us)
	CSFM	7272-1615:0221 PHOTOELECTRIC SMOKE DETECTOR
	NYC-MEA	117-05-E, Vol. II
	MSFM	2200 Sep 2008
Hong Kong	HKFSD	

Installation/Configuration Notes

- Refer to the FCP-500 Series Installation Guide (P/N: 610F.01U.000.626) for detailed instructions.
- Compatible with all UL Listed four-wire control panels. Refer to the manufacturer's installation instructions for proper EOL resistor selection. The EOL resistor can be connected to terminals in the FCA-500-E base.
- Install the detectors exclusively in the FCA-500 or FCA-500-E bases provided. In addition, install the detector base in an FAA-500-BB-UL ceiling-mount back box.
- Do not use FCP-500 detectors outdoors.
- Maintain an unobstructed hemispherical space with a radius of 1.7 ft (50 cm) below the detector.
- Ensure that people, larger animals, plants, or other objects do not intrude into this hemispherical area and that no parts of the detector surface become covered.
- Install the detector in a position which is out of arm's reach. A minimum mounting height of 9 ft (2.7 m) is recommended.
- Do not install FCP-500 detectors in rooms where data is transmitted by means of high-intensity infrared light (such as rooms with IR systems for interpreters).
- Do not mount the detectors in direct sunlight.
- Maintain a minimum distance of 1.7 ft (50 cm) from lamps. Do not mount the detectors in a cone of light from lamps.
- Consult NFPA 72 for proper detector placement. Use the specifications of a standard spot smoke detector. A half-inch conduit connector can be mounted to the back box.
- Six-conductor wiring is required to connect power, alarm contacts, and trouble contacts.

Parts Included

The FCP Series products are available individually or in kits. The kits contain:

FCP-500-K

Quant.	Component
1	FCP-500 Four-wire Detector Head (white)
1	FAA-500-BB-UL Flush-mount Back Box
1	FCA-500 Four-wire Detector Base (six-conductor)
1	FAA-500-TR-W Trim Ring (white)

FCP-500-PK

Quant.	Component
1	FCP-500-P Four-wire Detector Head (transparent)
1	FAA-500-BB-UL Flush-mount Back Box
1	FCA-500 Four-wire Detector Base (six-conductor)
1	FAA-500-TR-P Trim Ring (transparent)
16	Color insert rings

FCP-500-EK

Quant.	Component
1	FCP-500 Four-wire Detector Head (white)
1	FAA-500-BB-UL Flush-mount Back Box
1	FCA-500-E Four-wire EOL Detector Base (six-conductor)
1	FAA-500-TR-W Trim Ring (white)

FCP-500-EPK

Quant.	Component
1	FCP-500-P Four-wire Detector Head (transparent)
1	FAA-500-BB-UL Flush-mount Back Box
1	FCA-500-E Four-wire EOL Detector Base (six-conductor)
1	FAA-500-TR-P Trim Ring (transparent)
16	Color insert rings

FCP-500-CK

Quant.	Component
1	FCP-500-C Four-wire Detector Head with CO Sensor (white)
1	FAA-500-BB-UL Flush-mount Back Box
1	FCA-500 Four-wire Detector Base (six-conductor)
1	FAA-500-TR-W Trim Ring (white)

FCP-500-CPK

Quant.	Component
1	FCP-500-C-P Four-wire Detector Head with CO Sensor (transparent)
1	FAA-500-BB-UL Flush-mount Back Box
1	FCA-500 Four-wire Detector Base (six-conductor)
1	FAA-500-TR-P Trim Ring (transparent)
16	Color insert rings

FCP-500-CEK

Quant.	Component
1	FCP-500-C Four-wire Detector Head with CO Sensor (white)
1	FAA-500-BB-UL Flush-mount Back Box
1	FCA-500-E Four-wire EOL Detector Base (six-conductor)
1	FAA-500-TR-W Trim Ring (white)

FCP-500-CEPK

Quant.	Component
1	FCP-500-C-P Four-wire Detector Head with CO Sensor (transparent)
1	FAA-500-BB-UL Flush-mount Back Box
1	FCA-500-E Four-wire EOL Detector Base (six-conductor)
1	FAA-500-TR-P Trim Ring (transparent)
16	Color insert rings

Technical Specifications

Detection Principle

FCP-500(-P):	Scattered light measurement
FCP-500-C(-P):	Combination of scattered light measurement and CO algorithm

Drift Compensation

All FCP-500 detectors:	Drift compensation for smoke sensor baseline (optical sensors)

Environmental Considerations

Air Speed	300 ft/min (1.5 m/s) maximum
Humidity	95% (non-condensing)
Interference Immunity:	According to UL 268
Operating Temperature	+32 °F to +100 °F (0°C to +38°C)
Protection Category:	FAP-500(-C): IP 53 FAP-500(-C)-P: IP 33

Mechanical Properties

Color:	
Detector Housing:	White
Detector Front Plate:	FCP-500(-C): white FCP-500(-C)-P: transparent (color inserts)
Dimensions (diameter x D)	
Detector:	4.5 in. x 2.2 in. (11.4 cm x 5.6 cm)
Detector with Trim Ring:	5.9 in. x 2.2 in. (15 cm x 5.6 cm)
Detector with Trim Ring and Base:	5.9 in. x 2.75 in. (15 cm x 7 cm)
Material:	Polycarbonate

Mounting Considerations

Area Monitored:	Refer to NFPA 72 Guideline
Mounting Height:	Maximum: Refer to NFPA 72 Guidelines Minimum: 9 ft (2.7 m)
False Ceiling	
Clearance (minimum):	6 in. (15.2 cm) with tolerances of -0.0625 in. (1.6 mm) and +0.1875 in. (4.8 mm)
Mounting Hole:	5.0625 in. (12.9 cm)
Thickness (maximum):	1.25 in. (3.2 cm)

Outputs

Alarm	
Output:	Alarm output through normally-open (NO) relay in FCA-500 base. An alarm resistance of 0 Ω or 680 Ω in series to the relay can be chosen.
Relay Rating:	1 A at 30 VDC
Reset Time	The detector resets if power is interrupted for at least 2 sec.
Display	
Two-color LED:	Red = alarm, green = test mode, normal

Alarm	
Remote LED:	Normally-open (NO) relay connects ground through 1.5 kΩ, 20 mA maximum
Trouble	
Output:	Trouble output through normally-closed (NC) relay in FCA-500 base
Relay Rating:	1 A at 30 VDC
Power Requirements	
Current Consumption	
FCA-500 Base	Alarm: 47 mA Standby: 3.5 mA
FCA-500-E Base	Alarm: 47 mA Standby: 24 mA
Operating Voltage	
Four-wire:	9.7 VDC to 30 VDC

Ordering Information

FCP-500-C Photoelectric with CO Sensor (white) Photoelectric smoke detector (white) with CO sensor; requires base.	**FCP-500-C**
FCP-500-C-P Photoelectric with CO Sensor (transparent with color inserts) Photoelectric smoke detector (transparent with color inserts) with CO sensor; requires base.	**FCP-500-C-P**
FCP-500 Photoelectric (white) Photoelectric smoke detector (white); requires base.	**FCP-500**
FCP-500-P Photoelectric (transparent with color inserts) Photoelectric smoke detector (transparent with color inserts); requires base.	**FCP-500-P**
FCP-500-K Four-wire Kit (white) Kit contains FCP-500 detector head, back box, four-wire base, and trim ring (white).	**FCP-500-K**
FCP-500-PK Four-wire Kit (transparent with color inserts) Kit contains FCP-500 detector head, back box, four-wire base, and trim ring (transparent with color inserts).	**FCP-500-PK**
FCP-500-EK Four-wire EOL Kit (white) Kit contains FCP-500 detector head, back box, FCA-500-E four-wire EOL base, and trim ring (white).	**FCP-500-EK**
FCP-500-EPK Four-wire EOL Kit (transparent with color inserts) Kit contains FCP-500 detector head, back box, FCA-500-E four-wire EOL base, and trim ring (transparent with color inserts).	**FCP-500-EPK**

Ordering Information

FCP-500-CK Four-wire with CO Sensor Kit (white) Kit contains FCP-500-C detector head with CO sensor, back box, four-wire base, and trim ring (white).	**FCP-500-CK**
FCP-500-CPK Four-wire with CO Sensor Kit (transparent with color inserts) Kit contains FCP-500-C detector head with CO sensor, back box, four-wire base, and trim ring (transparent with color inserts).	**FCP-500-CPK**
FCP-500-CEK Four-wire EOL with CO Sensor Kit (white) Kit contains FCP-500-C detector head with CO sensor, back box, FCA-500-E four-wire EOL base, and trim ring (white).	**FCP-500-CEK**
FCP-500-CEPK Four-wire EOL with CO Sensor Kit (transparent with color inserts) Kit contains FCP-500-C detector head with CO sensor, back box, FCA-500-E four-wire EOL base, and trim ring (transparent with color inserts).	**FCP-500-CEPK**
Accessories	
FAA-500-BB-UL Ceiling-mount Back Box for US UL Listed ceiling-mount back box	**FAA-500-BB-UL**
FCA 500 Four wire Base Standard four-wire base for FCA-500 Series Detectors	**FCA 500**
FCA-500-E Four-wire EOL Base Supervised (EOL resistor included) four-wire base for FCA-500 Series Detectors	**FCA-500-E**
FAA-500-TR-P Trim Ring (Clear Plastic with Color Inserts) Clear plastic trim ring for use with the FCP-500 series detectors	**FAA-500-TR-P**
FAA-500-TR-W Trim Ring (white) White plastic trim ring for use with the FCP-500 series detectors	**FAA-500-TR-W**
FAA-500-TTL Test Adapter with Magnet The FAA-500-TTL Test Adapter is placed on the SOLO330 Smoke Detector Tester. It serves to test detectors in the 500 and 520 Series.	**FAA-500-TTL**
FAA-500-RTL Exchanger Device for Detectors of the 500 and 520 Series	**FAA-500-RTL**
DRA-5 Remote Annunciator (5 VDC) Designed to provide remote annunciation of alarms for a number of Bosch smoke and heat detectors	**DRA-5**

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