BOSCH
Invented for life

FRay5000-50-UL Reflective Beam Smoke Detector

- **Extended monitoring range**
- **Transmitter and receiver integrated into a compact housing**
- **Electronic and optical feature for detector alignment and self-alignment during operation**
- **Remote control unit at eye level for easy installation and programming**
- **Automatic contamination compensation**
- **Control unit with LED and LCD displaying - various operating states**
- **Adjustable alarm thresholds**
- **Building shift compensation**

The FRay5000-50-UL Reflective Beam Smoke Detector from Fire Fighting Enterprises covers distances between 26.25 ft and 330 ft (8 m and 100 m). A reflective prism allows for the accurate detection of smoke particles within the given distance range.

For ranges between 26.25 ft and 164 ft (8 m and 50 m), one prism is sufficient. For ranges between 164 ft and 330 ft (50 m and 100 m), four prisms are required. The additional prisms are included in the FRay5000-LR-Kit Long Range Kit.

Key application areas are large halls such as historical buildings, churches, museums, shopping centers, factory halls, warehouses, etc.

The FRay5000-50-UL Reflective Beam Smoke Detector is suitable for use in areas where point-type detectors are not effective.

Functions

The transmitter emits an invisible infrared light beam that is focused through a lens. The light beam is reflected by the prism mounted opposite and returned to the transmitter/ receiver combination.

If the IR beam is obscured by smoke and the signal received drops below the selected threshold (standard 10 s, adjustable), the detector triggers a fire alarm and the alarm relay closes.

The sensitivity can be adjusted according to the environmental conditions. The default settings of 25% (sensitive), 35% and 50% (non-sensitive) can be changed in steps of 1%.

The alarm relay can be set to auto-reset or latched mode. The LEDs indicate three different operating states:

- Alarm
- Fault
- Operation

You can control and set all parameters via the control unit and LCD display.

Slow changes in the operating states (e. g. component aging, optics contamination, etc.) do not cause false alarms, but are compensated by the automatic gain control. Every 15 minutes, the system state is compared with a default reference value and in the case of a deviation, is corrected automatically to 0.17 dB/h. If the compensation limit is reached, "Fault" the fault signal is indicated.

If the IR beam is obscured within 2 s and the obscuration is more than 87% and lasts for 10 seconds and above (operator changeable), the fault relay switches. Faults may be caused by an obstacle in the beam path, by the covering of the reflector, etc. As soon as the fault cause is removed, the fault relay is cleared and after 5 s, the detector is automatically reset to standard operation. The fire panel must be reset separately.

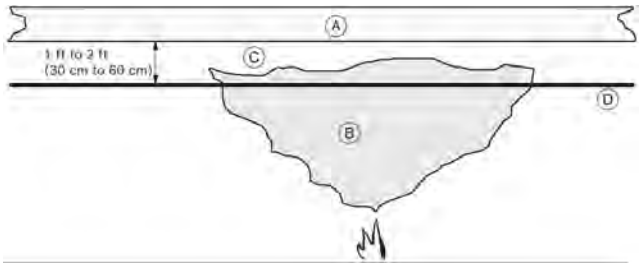
The system has an alarm output, which is a relay with a dry contact.

Certifications and Approvals

Region	Certification	
USA	UL	UROX.S3417 FRAY5000-UL
		Letter of Authorisation S3417 Fire Ray 5000
	CSFM	7260-1508:104 Fireray 5000
Canada	ULC	UROXC.S3417 FRAY5000-UL

Installation/Configuration Notes

- The line of sight between the detector and the reflector always has to be clear and may not be interfered by moving objects (e. g. overhead crane).
- Heat accumulation under the roof may prevent smoke from rising up to the ceiling. Thus, the detector must be mounted below the expected heat accumulation. Accordingly, the benchmark values for X1 specified in the table have to be exceeded.
- The mounting surface for the detector must be firm and vibration-free. Metal supports that may be affected by heat or cold are unsuitable for the installation.
- The detector and the reflector are typically installed at the same height and aligned with one another. The wide angle of the IR beam allows for an easy adjustment and for a reliable long-term stability.
- The detector must be mounted in a position where the detector's optical system is not exposed to direct sunlight or artificial light. Normal ambient light has no influence on the IR beam and the analysis.



Pos.	Description
A	Ceiling
B	Mushroom cloud
C	Heat accumulation
D	IR beam

- Since the smoke from a fire does not simply rise straight up, but rather spreads like a mushroom cloud (depending on air current and accumulation), the monitoring range is much greater than the diameter of the IR beam.
- The lateral detection on either side of the beam is 24.6 ft (7.5 m).
- Country-specific Standards and guidelines on planning must be observed.

Detector arrangement

The detectors must be arranged according to the following distances:

X1	Distance from the ceiling	1 ft to 2 ft (0.3 m to 0.6 m)
X2	Horizontal distance detector/wall	min. 1,6 ft (0.5 m)
X3	Horizontal distance between two detectors under gable roofs	

Example: Gable roof, 10° roof pitch

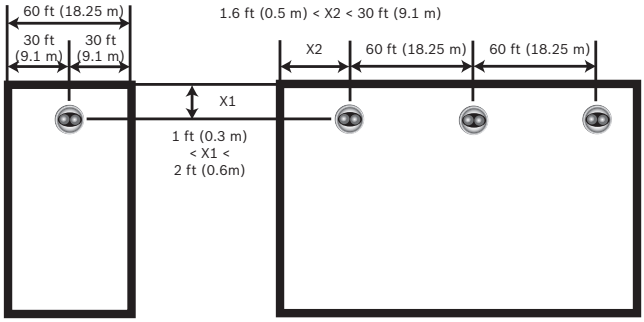
X3 = 30 ft + (30 ft x 10%)

X3 = 30 ft + 3 ft

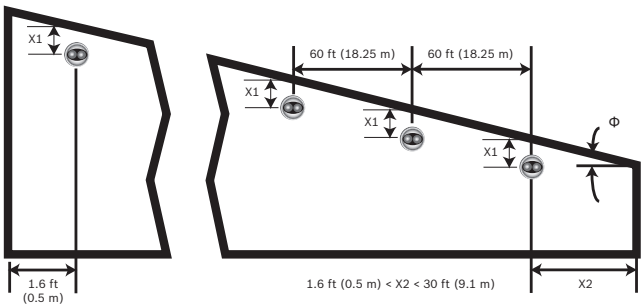
X3 = 33 ft

- The maximum distance between two detectors with parallel IR beams is 60 ft (18,25 m).
- The centre line of the monitoring beam may not be closer than 1,6 ft (0.5 m) to walls, furniture or stored goods.
- The reflectors allow an angle deviation of up to 5° from the centre line without causing a weakening of the signal.

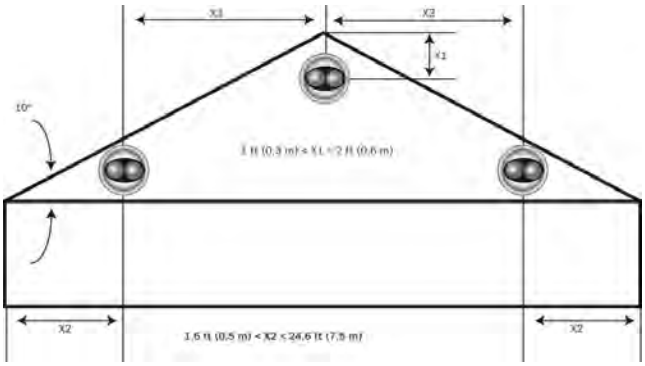
Positioning the detectors on flat ceilings



Positioning the detectors under a shed roof



Positioning the detectors under a gable roof



Parts Included

Qty.	Components
1	FRay5000-50-UL Reflective Beam Smoke Detector: compact device with integrated transmitter and receiver
1	Reflective prism
1	Control unit
1	Installation kit

Technical Specifications

Electrical

Operating voltage	14 V DC ... 28 V DC
Current consumption	
• In standby	< 12 mA @ 24 V DC
• In alarm/fault	< 52 mA @ 24 V DC
Reset control by power disruption	> 5 s
Alarm relay (contact load)	100 mA @ 30 V
Fault relay (contact load)	100 mA @ 30 V

Mechanics

LED indicators for	
• Alarm	Flashes red every 10 s
• Fault	Flashes yellow every 10 s
• Operation	Flashes green every 10 s s
Dimensions (W x H x D)	
• Detector	5.3 x 5.3 x 5.3 in (135 x 135 x 135 mm)
• Prism reflector	3.9 x 3.9 x 0.4 in (100 x 100 x 10 mm)
• Control unit	7.9 x 9.3 x 2.8 in (200 x 235 x 71 mm)
Housing	
• Color	Light gray/black
• Material	C6600, non-flammable
Weight	
• Detector	1.1 lbs (500 g)
• Prism reflector	0.15 lbs (70 g)
• Control unit	2.0 lbs (900 g)

Environmental conditions

Protection class as per EN 60529	IP 54
Permissible operating temperature	-22°F to 131°F (-20°C to 55°C)
Permissible operating temperature, UL Listed Installation	32°F to 100°F (0°C to 37.8°C)

Planning

Permissible distance detector-reflector	Min. 26.25 ft (8 m) – max. 164 ft (50 m)
•with FRay5000-LR-Kit Long Range Kit	Min. 164 ft (50 m) – max. 330 ft (100 m)
Lateral detection (on either sides of the light beam)	Max. 30 ft (9.1 m) (heed local guidelines!)

Special features

Optical wavelength	850 nm
Tolerance of the axial deviation	
• Detector	± 0.3°
• Reflective prism	± 5.0°

Ordering Information

FRay5000-50-UL Reflective Beam Smoke Detector 26.3 ft and 164 ft (8 m and 50 m)	**FRay5000-50-UL**
Accessories	
FRay5000-LR-Kit Long Range Kit 3 additional prisms for ranges between 164 ft and 328 ft (50 m and 100 m).	**FRay5000-LR-Kit**
FRAY5000-BR Universal Bracket Accessory for FRay5000 Universal Bracket for use with Fireray 5000 detector head or FRAY5000-4PRISM Prism Plate for 4 prism or FRAY5000-1PRISM Prism Plate for 1 prism.	**FRAY5000-BR**
FRAY5000-1PRISM Prism Plate for 1 prism Prism Plate for 1 prism for use with FRAY5000-BR Universal Bracket Accessory for Fireray 5000 (not included).	**FRAY5000-1PRISM**
FRAY5000-4PRISM Prism Plate for 4 prism Prism Plate for 4 prisms for use with FRAY5000-BR Universal Bracket Accessory for Fireray 5000 (not included).	**FRAY5000-4PRISM**
FRAY5000-DETBOX Detector Back Box Detector Back Box for FRay5000-50-UL Reflective Beam Smoke Detector. Requires FRAY5000-PLATE Cover Plate (sold separately, not available in APR).	**FRAY5000-DETBOX**

Ordering Information

FRAY5000-PLATE Cover Plate for Detector Back Box Cover Plate for FRAY5000-DETBOX Detector Back Box (sold separately, not available in APR).	**FRAY5000-PLATE**
FRAY5000-CTRBOX Controller Back Box for FRay5000 FRay-5000 Reflective Beam Detector Controller Back box with knock-outs (not available in APR).	**FRAY5000-CTRBOX**
FRAY5000-TRIM Trim Plate for FRay5000 Controller Back Box Semi Flush Trim Plate for use with FRAY5000-CTRBOX Controller Back Box for FRay5000 (sold separately, not available in APR).	**FRAY5000-TRIM**
FRAY5000-CMOUNT Ceiling Mount Ceiling Pendant Mount for FRay5000-50-UL Reflective Beam Smoke Detector prism and FRAY5000-BR Universal Bracket Accessory for FRay5000 (not available in APR).	**FRAY5000-CMOUNT**

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