FIRERAY5000-UL Beam smoke, reflective

www.boschsecurity.com

BOSCH
Invented for life

- ▶ Extended monitoring range
- ▶ Up to 2 detectors per system controller
- ▶ Two pairs of fire and fault relays (one per detector)
- ▶ Transmitter and receiver integrated into a compact housing
- ▶ Integral LASER alignment

The Fireray5000-UL Linear Smoke Detector 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 Fireray5000-UL Linear Smoke Detector is suitable for use in areas where point-type detectors are not effective

The Fireray5000-UL Linear Smoke Detector can be upgraded with one additional FRAY5000-HEAD-UL Detector Head. The system controller can control two detectors. Each head can be programmed separately.

Functions

The transmitter emits an invisible infrared light beam (850 nm) 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%. Each detector can be adjusted individually. The standard setting is 35%.

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 system controller and LCD display for each detector head.

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 potential-free change-over contact.
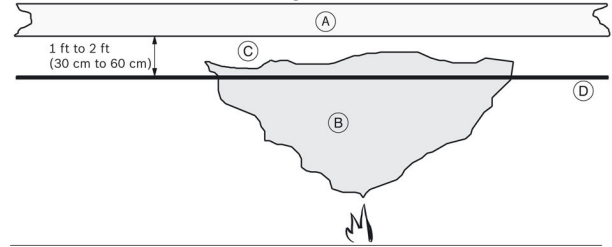
Certifications and approvals

Region	Regulatory compliance/quality marks	
USA	UL	UROX.S3417 Fireray5000-UL
	FM	3037125 Fireray5000-UL
	CSFM	see www.boschsecurity.com (the Bosch website)
	NYC-MEA	22-08-E Fireray5000-UL
	MSFM	2243 Fireray5000-UL
Canada	ULC	UROXC.S3417 Fireray5000-UL

Installation/configuration notes

- For connection to FPA-1000 and any UL-listed 24V control panel.
- 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 usually 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.

Installation for smoke plume

Pos.	Description
A	Ceiling
B	
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	

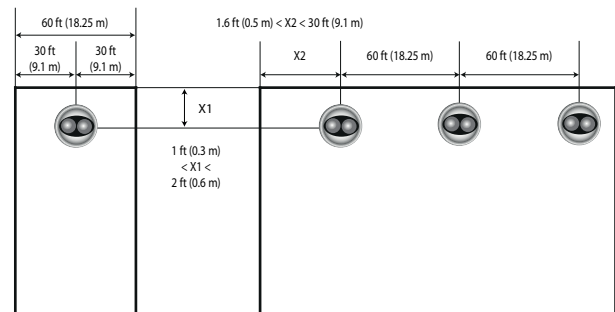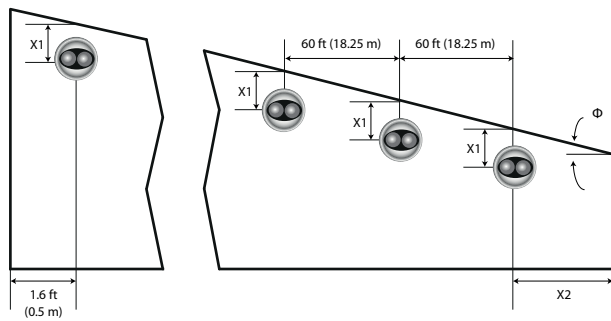Example: Gable roof, 10° roof pitch
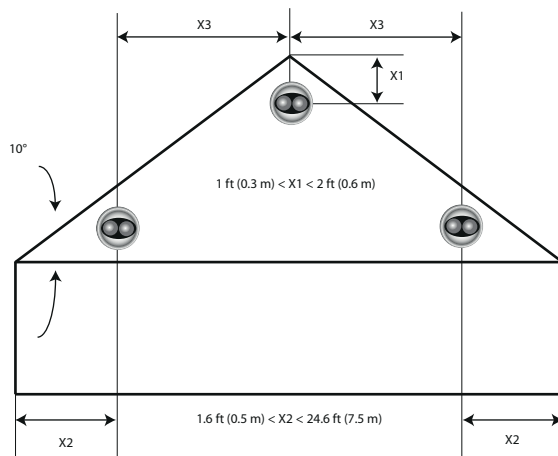X3 = 30 ft + (30 ft x 10%)
X3 = 30 ft + 3 ft
X3 = 33 ft

Positioning the detectors on flat ceilings

Positioning the detectors under a shed roof

Positioning the detectors under a gable roof

Parts included

Quantity	Component
1	Fireray5000 UL Linear 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 to 36 V DC
Current consumption	
• In standby, alarm or trouble (1 detector head)	5.5 mA
• In standby, alarm or trouble (2 detector heads)	8 mA
• In alignment mode (with 1 or 2 detector heads)	36mA (HiA) 5.5mA / 8mA (LoA)
Reset control by power disruption	> 5 s

Alarm relay (contact load)	100 mA @ 36 V
Fault relay (contact load)	100 mA @ 36 V

Mechanics

LED indicators for	
• Alarm	Flashes red every 10 s
• Fault	Flashes yellow every 10 s
• Operation	Flashes green every 10 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 3.2 in (200 x 235 x 81 mm)
Housing	
• Color	Light gray/black
• Material	C6600, non-flammable
Weight	
• Detector	1.1 lbs (500 g)
• Prism reflector	0.22 lbs (100 g)
• Control unit	2.2 lbs (1000 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!)
Connectable detectors per system controller	1 or 2

Special features

Optical wavelength	850 nm
Tolerance of the axial deviation	

• Detector	± 0.3°
• Reflective prism	± 5.0°

Ordering information

FIRERAY5000-UL Beam smoke, reflective
Reflective linear smoke detector with one detector head and one prism, range min. 26.25ft - max. 164ft (for ranges between 164 ft and 330 ft four prisms are required), comply with UL
Order number **FIRERAY5000-UL**

Accessories

FRAY5000-HEAD-UL Additional head, UL application
additional detector head
Order number **FRAY5000-HEAD-UL**

FRAY5000-LR-KIT Extension kit, long-range
3 additional prisms for Fireray5000-EN and Fireray5000-UL, for ranges between 164 ft and 328 ft (50 m and 100 m)
Order number **FRAY5000-LR-KIT**

FRAY5000-BR Universal bracket
universal bracket for Fireray5000 detector head or prism plate (FRAY5000-1PRISM or FRAY5000-4PRISM)
Order number **FRAY5000-BR**

FRAY5000-1PRISM Prism plate, 1 prism
prism plate for 1 prism, for use with universal bracket FRAY5000-BR
Order number **FRAY5000-1PRISM**

FRAY5000-4PRISM Prism plate, 4 prisms
prism plate for 4 prisms, for use with universal bracket FRAY5000-BR
Order number **FRAY5000-4PRISM**

FRAY5000-DETBOX Detector backbox
Detector Back Box for FRay5000-50-UL Reflective Beam Smoke Detector. Requires FRAY5000-PLATE Cover Plate (sold separately, not available in APR).
Order number **FRAY5000-DETBOX**

FRAY5000-PLATE FRAY5000 Cover Plate for Detector Back B
Cover Plate for FRAY5000-DETBOX Detector Back Box (sold separately, not available in APR).
Order number **FRAY5000-PLATE**

FRAY5000-CTRBOX Controller back box
FRay-5000 Reflective Beam Detector Controller Back box with knock-outs (not available in APR).
Order number **FRAY5000-CTRBOX**

FRAY5000-TRIM Trim plate for controller back box
Semi Flush Trim Plate for use with FRAY5000-CTRBOX Controller Back Box for FRay5000 (sold separately, not available in APR).
Order number **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).
Order number **FRAY5000-CMOUNT**