BOSCH
Invented for life

Fireray 50/100RV Linear Smoke Detectors

- **Extended monitoring area**
- **Transmitter, receiver, and evaluating unit integrated into a compact housing**
- **Electronic help for detector alignment and automatic detector calibration procedure**
- **Automatic compensation for contamination**
- **LED display in control unit for various operating states**
- **Adjustable alarm thresholds**

The Linear Smoke Detectors Fireray 50RV and Fireray 100RV are easy to mount, cost-effective, and work in retro-operation with an extended range:

- Fireray 50RV: 5 m to 50 m

- Fireray 100RV: 50 m to 100 m

Preferred areas of application are historical buildings, churches, museums, shopping centers, factory halls, warehouses, power plants, ex areas, contaminated environments, etc.

Functions

The transmitter emits an infrared light beam (880 nm) that is focused through a lens and invisible. The light beam is reflected by 180° by the prism reflector 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 value for 10 s, the Fireray triggers a fire alarm and the alarm relay closes.

The activation threshold can be adjusted to the environmental conditions. Settings 25% (sensitive), 35%, and 50% (non-sensitive) are possible.

For the alarm relay, you can select between auto-reset and alarm storage.

Various operating states are displayed by LEDs:

- Alarm
- Malfunction
- Operating display
- End of the readjustment for contamination/aging

Slow changes in the operating states (e. g. aging of the components, contamination of the optic, etc.) do not lead to faulty triggering, but are compensated for by automatic amplification control. The state of the system is compared with a default reference value every 15 minutes and in case of deviations, compensated automatically up to 0.7 dB/h. If the readjustment limit is reached, either "Malfunction" or "Alarm" is triggered.

If the IR beam is obscured for at least 10 seconds by more than 90% with a sharp signal increase, the fault relay switches. The reason can be an obstacle in the beam path, turning of the detector, covering of the reflector, etc. After removing the cause of the malfunction, the fault relay is set again and the detector is reset automatically into the detection-ready state after 5 s. The fire panel must be reset separately.

The detector has an alarm output in the form of a floating self-holding relay contact.

Certifications and Approvals

Meets the following regulations:

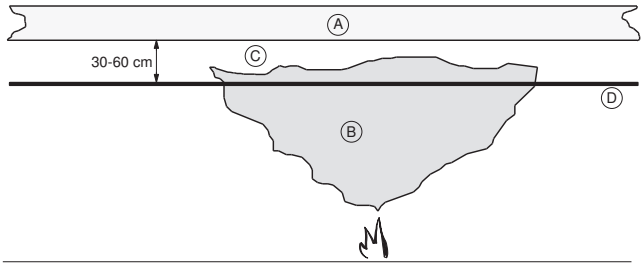
- BS 5839 Part 5
- EN54-12:2002

Region	Certification	
Germany	VdS	G 203070 Fireray 50RV/100RV
Switzerland	VKF	AEAI 19200 Fireray 50RV_Fireray 100RV
Europe	CE	Fireray 50RV/100RV
	CPD	0786-CPD-20045 Fireray 50R/50RV/ 100R/100RV
Russia	GOST	POCC.YII001.BO7219 Fireray2000 & Fireray 50-100RV
		POCC GB.bb02.HO4311 Fireray2000 & Fireray50-100RV
Sweden	INTYG	09-407 Fireray 50_Fireray 100

Installation/Configuration Notes

General installation/configuration notes

- For connection to the LSN, the following are required:
  - One FLM-420/4-CON Conventional Interface Module
  - One Mini Distributor a.P. 6 DA.
- To implement cross zoning, the following are required:
  - One FLM-420/4-CON Conventional Interface Module
  - One Mini Distributor a.P. 6 DA.
- Between the detector and reflector there must be a constant visual connection, which may not be interrupted by movable objects (e. g. overhead crane).
- Detector and reflector are generally installed at the same height and aligned with one another. The relatively wide angle of the IR beam makes adjustments easier and guarantees reliable long-term stability.
- 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 reflector is mounted at the permissible distance on a solid, non-reflecting surface, whereby the light beam must hit the reflector vertically.
- The detector must be installed so that direct irradiation of sunlight or artificial light into the optical system is prevented. Normal ambient light has no influence on the IR beam and the analysis.
- A screened cable must be used to protect against radiated interference. Possible sources of interference are to be avoided when routing cables and the cable must be protected against mechanical damage.
- Heat accumulation under roof surfaces can prevent the travel of climbing smoke to the ceiling. The detector must therefore be mounted below an expected heat accumulation. This can mean that the benchmark values for D_L specified in the table must be exceeded.



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

- Since the smoke over a fire source does not just climb vertically upwards, but rather spreads like a mushroom cloud (depending on existing air currents and air pads), the width of the monitoring area is much greater than the diameter of the IR beam.
- The sideways detection width on both sides of the beam center line is 7.5 m.
- Country-specific standards and guidelines with respect to planning must be adhered to.

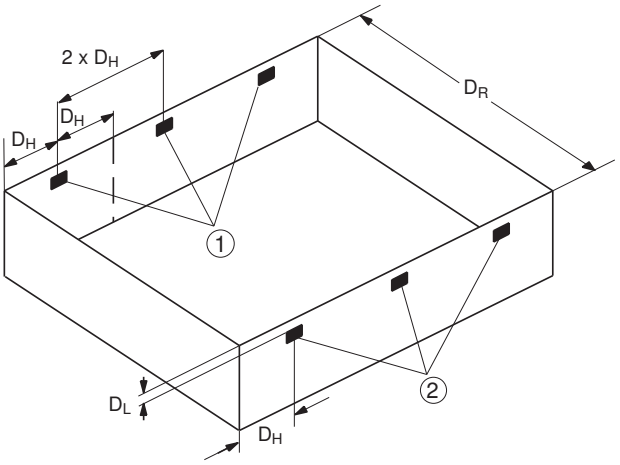
Detector arrangement

The detectors must be devided up so that the following distances are adhered to:

D_H	horizontal distance detector-wall or detector-ceiling	at least 0.5 m, max. 7.5 m
2 x D_H	Distance between two parallel beams	max. 15 m
D_L	Distance from the ceiling	0.3 m to 0.6 m
D_R	Range = distance detector-reflector. - Fireray 50RV: - Fireray 100RV:	 over 5 m to 50 m over 50 m to 100 m

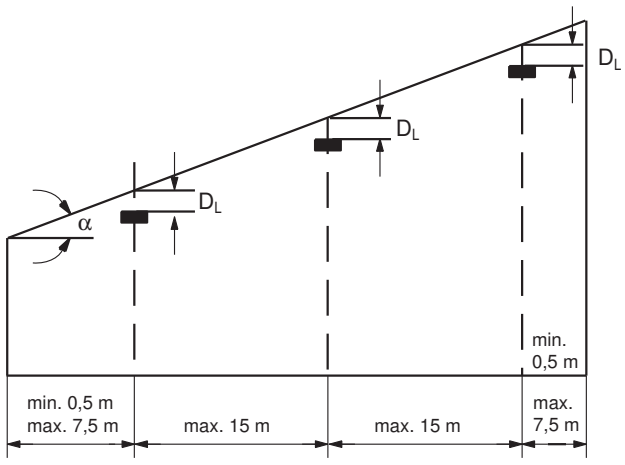
- The center line of the monitoring beam may not be closer than 0.5 m to walls, equipment or stored goods.
- The prism reflectors permit angle deviations up to 5° from the center line without signal weakening.

Positioning detectors on flat ceilings

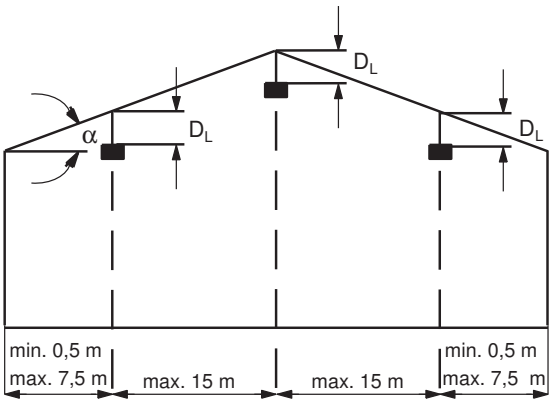


Pos.	Description
1	Fireray 50/100RV
2	Prism reflectors
D_H,D_L,D_R	see table above

Positioning the detectors in a tilted roof



Positioning the detectors in a saddleback roof



Note The ceiling distance can be reduced with saddleback roofs by 1 % per degree, maximum 25 %.

Detector arrangement in accordance with VdS/VDE

- The number of light beam smoke detectors must be selected so that the maximum monitoring area A in the table is not exceeded (meets VdS 2095 and DIN VDE 0833-2).

Room height R_H	D_H	A	D_L at α < 20°	D_L at α > 20°
up to 6 m	6 m	1200 m^2	0.3 m to 0.5 m	0.3 m to 0.5 m
over 6 m to 12 m	6.5 m	1300 m^2	0.4 m to 0.7 m	0.4 m to 0.9 m
more than 12 m to 16 m *) **)	7 m *)	1400 m^2 **)	0.6 m to 0.9 m **)	0.8 m to 1.2 m **)

D_H = greatest permissible horizontal distance of any point of the ceiling to the next-closest beam
A = maximum monitoring area per detector (= double the product of the greatest horizontal distance D_H and highest allowable detector/reflector distance)
D_L = distance of the detector to the ceiling
α = angle which the roof/ceiling pitch forms with the horizontal; if a roof has different pitches (e. g. sheds), use the smallest existing pitch
** With a room height of more than 12 m, it is recommended that you provide a second monitoring level on which the detectors are arranged offset to the first monitoring level*
*** Depends on use and environmental conditions (e. g. quick fire development and smoke spread)*

- Depending on the roof construction (flat, tilted or saddleback), the detectors and reflectors must be arranged depending on the roof pitch α and the room height R_H so that the light beam in the distance D_L runs under the roof (see table).

Parts Included

Fireray 50RV

Qty.	Components
1	Linear Smoke Detector Fireray 50RV: compact device with integrated transmitter, receiver, and control unit
1	Prism reflector
1	Test filter
1	Connection cable with plug
1	Installation material

Fireray 100RV

Qty.	Components
1	Linear Smoke Detector Fireray 100RV: compact device with integrated transmitter, receiver, and control unit
4	Prism reflectors
1	Test filter
1	Connection cable with plug
1	Installation material

Technical Specifications

Electrical

Operating voltage	10 V DC . . . 30 V DC
Current consumption	
• In standby	< 4 mA @ 24 V
• In alarm/malfunction	< 15 mA
Reset control by power disruption	> 5 s
Alarm relay (contact load)	Open contact, potential free (2 A @ 30 V DC)
Fault relay (contact load)	Break contact element, potential free (2 A @ 30 V DC)

Mechanics

LED indicators for	
• Alarm	Red
• Malfunction	Yellow
• Operation	Yellow flashing once in 10 seconds
• Limit of the readjustment for contamination/aging	Yellow flashing once in 2 seconds
Dimensions (W x H x D)	
• Fireray 50/100RV	126 x 210 x 120 mm
• Prism reflector	100 x 100 x 9.5 mm
Housing Color	Light gray/black
Housing material	ABS, non-flammable
Weight	670 g

Environmental conditions

Protection class as per EN 60529	IP 50
Permissible operating temperature	-30 °C . . . 55 °C

Planning

Permissible distance detector-reflector	
• Fireray 50RV	Min. 5 m - max. 50 m
• Fireray 100RV	Min. 50 m - max. 100 m
Side detection width (on both sides of the light beam)	Max. 7.5 m (Heed local guidelines!)

Special features

Optical wavelength	880 nm
Adjustable alarm threshold values	2.50 dB (25%) 3.74 dB (35%) 6.02 dB (55%)
Tolerance of the axial deviation (at 35% sensitivity)	
• Detector	± 0.8°
• Prism reflector	± 5.0°

Ordering Information

Fireray 50RV Linear Smoke Detector, retro-operation, range 5 m to 50 m	**Fireray 50 RV**
Fireray 100RV Linear Smoke Detector, retro-operation, range 50 m to 100 m	**Fireray 100 RV**
Accessories	
FLM-420/4-CON-S Conventional Interface Module 4-wire LSN with 2 primary lines for 2- or 4-wire conventional detectors, with surface-mounted housing	**FLM-420/4-CON-S**
FLM-420/4-CON-D Conventional Interface Module 4-wire LSN with 2 primary lines for 2- or 4-wire conventional detectors, type DIN rail	**FLM-420/4-CON-D**

Americas:
Bosch Security Systems, Inc.
130 Perinton Parkway
Fairport, New York, 14450, USA
Phone: +1 800 289 0096
Fax: +1 585 223 9180
security.sales@us.bosch.com
www.boschsecurity.us

Europe, Middle East, Africa:
Bosch Security Systems B.V.
P.O. Box 80002
5600 JB Eindhoven, The Netherlands
Phone: + 31 40 2577 284
Fax: +31 40 2577 330
emea.securitysystems@bosch.com
www.boschsecurity.com

Asia-Pacific:
Robert Bosch (SEA) Pte Ltd, Security Systems
11 Bishan Street 21
Singapore 573943
Phone: +65 6258 5511
Fax: +65 6571 2698
apr.securitysystems@bosch.com
www.boschsecurity.com

Represented by

T697337867 | Cur: en-US, V24, 30 Sep 2010