Fireray 50/100RV Linear Smoke Detectors

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.

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
Certifications and Approvals

Meets the following regulations:
- BS 5839 Part 5
- EN54-12:2002

<table>
<thead>
<tr>
<th>Region</th>
<th>Certification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>VdS G 203070</td>
<td>Fireray 50RV/100RV</td>
</tr>
<tr>
<td>Switzerland</td>
<td>VKF AEAI 19200</td>
<td>Fireray 50RV_Fireray 100RV</td>
</tr>
<tr>
<td>Europe</td>
<td>CE 0786-CPD-20045</td>
<td>Fireray 50RV/50RV/100RV</td>
</tr>
<tr>
<td>Russia</td>
<td>GOST POCC.YII001.B07219</td>
<td>Fireray2000 &amp; Fireray 50-100RV</td>
</tr>
<tr>
<td>Sweden</td>
<td>INTYG 09-407</td>
<td>Fireray 50_ Fireray 100</td>
</tr>
</tbody>
</table>

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).
- The sideways detection width on both sides of the beam center line is 7.5 m.
- The center line of the monitoring beam may not be closer than 0.5 m to walls, equipment or stored goods.

- 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.
- Between the detector and reflector there must be a constant visual connection, which may not be interrupted by movable objects (e.g. overhead crane).
- 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 center line of the monitoring beam may not be closer than 0.5 m to walls, equipment or stored goods.

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- 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.

- 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.
- The prism reflectors permit angle deviations up to 5° from the center line without signal weakening.

Detector arrangement

The detectors must be divided 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
- \(2 \times D_H\): Distance between two parallel beams  
  - at least 15 m
- \(D_L\): Distance from the ceiling  
  - 0.3 m to 0.6 m
- \(D_R\): Range = distance detector-reflector.  
  - Fireray 50RV: over 5 m to 50 m  
  - Fireray 100RV: over 50 m to 100 m

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Positioning detectors on flat ceilings

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Description</th>
<th>D_H, D_L, D_R</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fireray 50/100RV</td>
<td>see table</td>
</tr>
<tr>
<td>2</td>
<td>Prism reflectors</td>
<td>above</td>
</tr>
</tbody>
</table>

Positioning the detectors in a tilted 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 is not exceeded (meets VdS 2095 and DIN VDE 0833-2).

<table>
<thead>
<tr>
<th>Room height</th>
<th>D_H</th>
<th>A</th>
<th>D_L at α &lt; 20°</th>
<th>D_L at α &gt; 20°</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 6 m</td>
<td>6 m</td>
<td>1200 m²</td>
<td>0.3 m to 0.5 m</td>
<td>0.3 m to 0.5 m</td>
</tr>
<tr>
<td>over 6 m to 12 m</td>
<td>6.5 m</td>
<td>1300 m²</td>
<td>0.4 m to 0.7 m</td>
<td>0.4 m to 0.9 m</td>
</tr>
<tr>
<td>more than 12 m*</td>
<td>7 m</td>
<td>1400 m²**</td>
<td>0.6 m to 0.9 m**</td>
<td>0.8 m to 1.2 m**</td>
</tr>
</tbody>
</table>

D_H = greatest permissible horizontal distance of any point of the roof 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/reflectors 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

<table>
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<tr>
<th>Qty.</th>
<th>Components</th>
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<tbody>
<tr>
<td>1</td>
<td>Linear Smoke Detector Fireray 50RV: compact device with integrated transmitter, receiver, and control unit</td>
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<td>1</td>
<td>Prism reflector</td>
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<tr>
<td>1</td>
<td>Test filter</td>
</tr>
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<td>1</td>
<td>Connection cable with plug</td>
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<td>Installation material</td>
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<tr>
<td>1</td>
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<tr>
<td>4</td>
<td>Prism reflectors</td>
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<tr>
<td>1</td>
<td>Test filter</td>
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<td>1</td>
<td>Connection cable with plug</td>
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<td>1</td>
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### 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-reflectors**
  - 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-CNS Conventional Interface Module 4-wire LSN**
  - with 2 primary lines for 2- or 4-wire conventional detectors, with surface-mounted housing
  - **FLM-420/4-CNS**

- **FLM-420/4-CDN Conventional Interface Module 4-wire LSN**
  - with 2 primary lines for 2- or 4-wire conventional detectors, type DIN rail
  - **FLM-420/4-CDN**