



Fireray® 50R/100R

Reflective Beam Smoke Detector

The Fireray® 50R/100R series conventional infra-red beam smoke detectors provide economical and effective protection of large, open plan spaces with high ceilings, particularly if access to 'point type' smoke detectors presents practical difficulties.

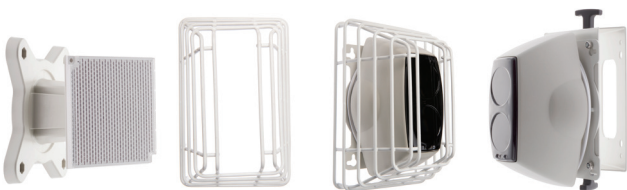
The Fireray® 50R/100R beam smoke detectors are ideally suited for protecting warehouses, factories, atria, shopping malls, leisure centres, churches, museums, power stations and industrial plants.

The Fireray® 50R/100R beam smoke detectors can be connected to a zone of a conventional fire alarm control panel, or interfaced to an analogue addressable system via an addressable interface input module or a zone monitor module.

Features

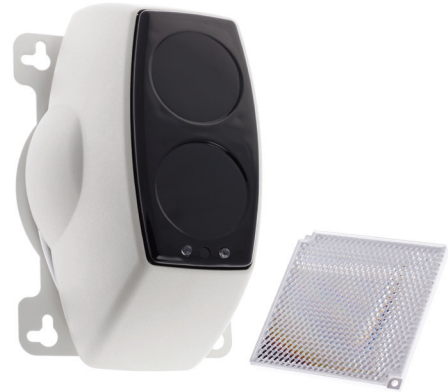
- Combined transmitter and receiver unit in one discrete unit
- Range 5-50 Metres (Fireray® 50R), 50-100 Metres (Fireray® 100R)
- Low current consumption
- Automatic self check drift compensation
- Selectable sensitivity/threshold levels
- Selectable latching / non latching fire alarm
- LED indicators to aid the alignment process
- Optional Low Level Test Unit for UL models only

Accessories



Approvals:

World-wide approvals include EN54:12 and UL268.
Visit www.ffeuk.com for up to date approvals information.



Operation

The 50R/100R has three selectable 'Alarm Thresholds' settings of 25%, 35% and 50% which can be selected to suit the environment. If the received infra-red signal reduces to below the selected threshold for approximately 10 seconds, the fire relay is activated. There are two modes of operation for the fire relay. 'Auto Reset Mode' will reset the fire relay approximately 5 seconds after the received infra-red signal has recovered to a level above the alarm threshold. 'Latching Mode' holds the fire relay active indefinitely after an alarm condition has occurred.

If the infra-red beam is obscured rapidly to a level of 90% or greater for 10 seconds the fault relay is activated. This condition can be achieved in a number of ways, for example, an object being placed in the beam path, transmitter failure, loss of the prism, or sudden misalignment of the detector. The fault relay will reset within 5 seconds of the condition being rectified.

The Fireray 50R/100R beam smoke detectors monitor long term degradation of beam signal strength caused by the build up of dirt on its optical surfaces; this operates by comparing the received infra-red signal against a reference voltage every 15 minutes.

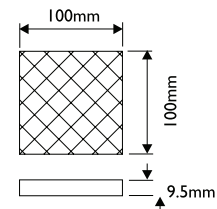
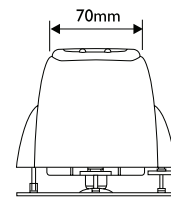
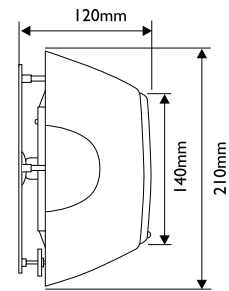
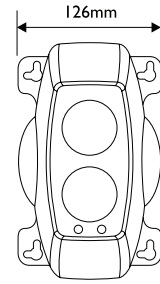
For UL models only, an optional 'Low Level Test Unit' is available, to test the correct function of the beam detectors at ground level. Operation of a key switch will produce a periodic flash of the green LED on the Low Level Test Unit confirming the beam detector on test is "live"; after a set period the red LED on the Low Level Test Unit and the red LED on the beam detector illuminate simultaneously.



Fireray® 50R/I00R

Technical Specification

Operating Range F50RV / RU:	5 to 50 Metres
Operating Range F100RV / RU:	50 to 100 Metres
Operating Voltage Range:	10.2V DC to 30Vdc
Quiescent Current:	<4mA @ 24Vdc
Alarm Current:	< 15mA
Power Down Reset Time:	5 seconds
Fire Relay Contacts:	Normally Open, VFCO 2A @ 30 Volts DC, resistive
Fault Relay Contacts:	Normally Closed, VFCO 2A @ 30 Volts DC, resistive
Operating Temperature:	-20°C to +55°C (non-condensing) EN54 Applications - 10°C to +55°C (non-condensing)
Fire Alarm Thresholds:	1.25dB (25%), 1.87dB (35%), 3.00dB (50%)
Optical Wavelength:	880nm
Detector Dimensions:	Width 126mm, Height 210mm, Depth 120mm
Prism Dimensions:	Width 100mm, Height 100mm, Depth 9.5mm
Weight:	0.67 kg
LED Indications:	Red LED: Indicates FIRE Continuous Amber LED: Indicates FAULT Flashing Amber LED: Once every 10 seconds indicates normal operating mode (RV Models only) Flashing Amber LED: Once every 2 seconds indicates the compensation function has reached its limit
Conditions:	Alarm Condition: Indicated by fire relay closing Fault Condition: Indicated by fault relay opening Alarm may be latching or non-latching (default)
IP Rating:	IP50
Relative Humidity:	RH 0% to 93%, (non-condensing)
Approvals/Certification:	Designed, manufactured and certified to EN54-12: 2002, Use 25% and 35% (default) thresholds. The 50% threshold is recommended for hostile and extreme environments.
CPD Reference:	0786-CPD-20045
UL File:	S3417
Parts List:	1 x Detector Head Assembly, 1 x prism (50R) or 4 x prisms (100R), 1 x Test Filter, 1 x Cable Interface
Housing Construction:	Flame Retardant ABS, Finish: Grey / Black



Installation Recommendations

The installation of the Fireray® infra-red beam smoke detector should be undertaken in accordance with recognized national or international standards and codes of practice. Please refer to our installation guide. We also recommend that simulated fire tests are conducted to ensure the desired response time is met for a given installation.

Specifications and wiring information are provided for information only and are believed to be accurate. FFE Ltd assumes no responsibility for their use. Data and design are subject to change without notice. Installation and wiring instructions are shipped with the products and should always be used for actual installation. For more information, contact your Sales Representative.

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Fireray® 3000

End-to-End Beam Smoke Detector

The Fireray® 3000 End-to-End Infra-red beam smoke detector has been designed using the latest optical technology, incorporating modern industrial, electronic and software techniques. This detector offers cost effective protection of large, open area spaces with high ceilings. It is also very suited to applications where access to ceiling mounted smoke detectors presents practical difficulties.

The Fireray® 3000 is ideal for applications where line of sight for the IR (infra-red) detection path is narrow and where the building structure uses reflective surfaces. It has also been designed to be aesthetically pleasing and thus can equally suit modern architectural buildings as well as heritage sites, particularly where ornate ceilings exist.

Features

- Range 5 to 120 metres, configurable per set of detectors
- Light cancellation technology
- Integral laser alignment in receiver
- 2-wire Interface between controller and receiver
- Single and twin detector options
- Separate fire and fault relays per detector
- Low level controller with LCD display
- Programmable sensitivity and fire/threshold
- Contamination compensation
- First-Fix design for transmitter, receiver and controller
- Multiple cable gland knockouts for ease of wiring
- Optional transmitter powering from controller
- Working optical path for detector alignment

Approvals:

World-wide approvals include EN54:12 and UL268.
Visit www.ffeuk.com for up to date approvals information.



Operation

The system comprises a modern looking transmitter head, which emits a narrow beam of infra-red light to an associated receiver head, with a compact low level controller. Once smoke crosses through and thus obscures the IR beam path, the signal strength at the receiver drops below a preset level which in turn results in an alarm condition.

Both the detector heads, transmitter and receiver, have integrated alignment thumbwheels for ease of alignment. Using these thumbwheels provides a smooth and repeatable alignment process. The detector heads have up to 10 degrees of adjustment in both planes. For further adjustment, a bespoke adjustment bracket is available, which offers up to 180 degrees movement in both planes, as well as a full 360-degree rotation.

The Fireray® 3000 has been designed so that it can be installed by one operator, with its laser assisted alignment method combined with easy to use alignment LED's offering visual feedback. Integrated laser alignment aid can be activated at the controller or at the receiver head.

The Fireray® 3000 also has a feature which allows for the transmitter to be powered from the Controller by wiring directly, thus reducing the number of power supplies required.

The low level controller incorporates a LCD display, which offers a full icon-based, easy-to-use interface unit. This controller enables ease of commissioning, testing and maintenance of the beam detection system. During commissioning the detector's fire sensitivity thresholds can be selected, along with the user variable time to fire and time to fault settings.

The system is fully compliant with the requirements of RoHS and WEEE.

Fireray® 3000

Technical Specification

Operating Range:	5 to 120 Metres
Operating Voltage Range:	12 to 36V DC ± 10%
Operating Controller Current (with 1 or 2 Receivers):	14mA (constant)
Operating Transmitter Current:	8mA (per Transmitter)
Power Down Reset Time:	>20 seconds
Fire and Fault Relay Contacts:	VFCO 2A @ 30 Volts DC resistive
Operating Temp. (non-condensing):	
UL -	-20°C to +55°C
EN54 -	-10°C to +55°C
Optical Wavelength:	850nm
LED Indications:	
Control Unit -	Red = Fire Amber = Fault Green = System OK
Receiver -	Alignment LEDs for single person alignment.
IP Rating:	IP54 (Controller)
Relative Humidity (non-condensing):	93%
Parts List (System):	1 x Transmitter (clear lens) 1 x Receiver (dark lens) 1 x Control Unit
Parts List (Additional Detector):	1 x Transmitter (clear lens) 1 x Receiver (dark lens)
Housing Material (Transmitter/Receiver/Controller):	UL94 V2 PC
CPD Reference:	0786-CPD-21 62
UL File:	S3417

All figures are quoted for 25°C

Fireray® 3000 Accessories



Flush Mount Plate
3000-202



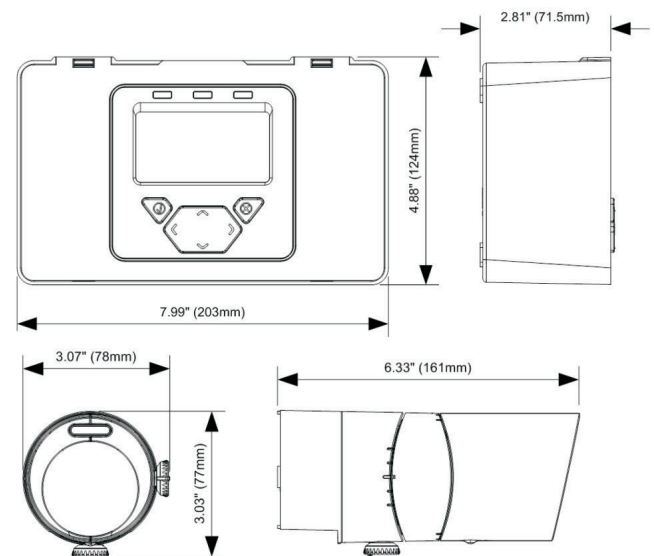
Adjustment Bracket
3000-201

Alarm & Operation Thresholds

	Min	Type	Max
Delay to Alarm/Fault (selectable in 1 sec steps):	2s	10s	30s
Laser Time-out (selectable in 1 min steps):	1min	5min	59min
Response Sensitivity/Threshold (selectable in 1% steps):	35%	60%	

Weight

Control Unit:	203 x 124 x 71.5mm (W x H x D) 606g
Transmitter & Receiver	78 x 77 x 161mm (W x H x D) 207gms



Installation Recommendations

Please refer to the User Guide (UG) for mounting, wiring and commissioning instructions. The installation of the 3000 End-To-End infra-red optical beam smoke detector should be undertaken in accordance with the recognised national, or international, standards and Codes of Practice (COP)



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Document Part No: 24-0237-01

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Fireray[®] 3000 Exd

Flameproof Optical Beam Smoke Detector



The Fireray[®] 3000 Exd is ideally suited for the protection of large areas, with potentially explosive atmospheres, against smoking fires. Fireray[®] 3000 Exd comprises an infrared transmitter and a receiver, both of which are ATEX-certified for use in Group 2 hazardous areas. There is a separate, safe area, wall-mounted remote/low level control unit to allow adjustment and testing from a convenient non-hazardous location.

The product is designed for large enclosures within oil rigs, refineries, ordnance stores and similar premises. It provides an early warning of smouldering or strongly smoke-generative fires, which may not be picked up by flame detectors installed in many hazardous areas.

Features

- Separate transmitter and receiver unit certified to Exd
- Allows for 2 Detectors per System Controller
- Range 10 to 80 meters, (33ft to 262ft) configurable per set of Detectors
- Integral Laser Alignment in Receiver
- 2-wire Interface between Controller and Receiver
- Separate Fire and Fault Relays per Detector
- Remote/low Level Controller with LCD display (Safe Area)
- Programmable Sensitivity and Fire/Fault delay
- Contamination Compensation for dust and building movement
- Multiple cable gland knockouts for ease of wiring
- Transmitter can be powered from Controller
- Complies with ATEX
- Light Cancellation Technology

Operation

The Transmitter head emits a narrow beam of infra-red light to an associated Receiver head. Once smoke crosses through and thus obscures the IR beam path, the signal strength at the Receiver drops below a preset level which in turn results in an alarm condition.

The Fireray[®] 3000 Exd has been designed so that it can be installed by one operator, with its laser assisted alignment method combined with easy to use alignment LEDs offering visual feedback. Integrated laser alignment aid can be activated at the Controller.

The Fireray[®] 3000 Exd also has a feature which allows for the Transmitter to be powered from the Controller by wiring directly, thus reducing the number of power supplies required.

The low level system Controller incorporates a LCD display, which offers a full icon-based, easy-to-use interface unit. This Controller enables ease of commissioning, testing and maintenance of the beam detection system. During commissioning the detector's fire sensitivity thresholds can be selected, along with the user variable time to fire and time to fault settings.

The system is fully compliant with the requirements of RoHS and WEEE.

The Fireray[®] 3000 Exd comes with a 5 year warranty as standard. With continued servicing and maintenance, the lifetime of the beam can exceed 10 years.

The Fireray[®] 3000 Exd comes supplied with a Cable Gland Type E (Double Compression for Armoured Cables), approved by VdS.

The "E" type double compression gland is a certified Flameproof Ex d, providing a controlled Exd seal on the cable inner sheath, an environmental seal on the outer sheath and a detachable armour specific clamping system for the wire armoured cables.

Approvals:

The Fireray[®] 3000 Exd complies with the ATEX directive.
Ex II 2GD Ex db op is IIC T6 Gb
Ex tb IIIC T85°C Db



Fireray® 3000 Exd

Technical Specification

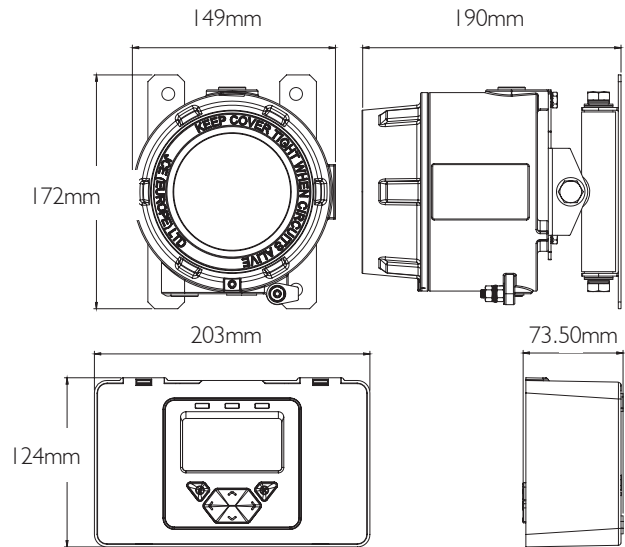
Operating Range:	10 to 80 meters, (33ft to 262ft)
Operating Voltage Range:	12 to 36V DC ± 10%
Operating Controller Current (with 1 or 2 Receivers):	14mA (constant)
Operating Transmitter Current:	8mA (per Transmitter)
Power Down Reset Time:	>20 seconds
Fire and Fault Relay Contacts:	VFCO 2A @ 30 Volts DC resistive
Operating Temp. (non-condensing):	-10°C to +55°C, (14°F to 131°F)
Optical Wavelength:	850nm
LED Indications:	
Control Unit -	Red = Fire Amber = Fault Green = System OK
Receiver -	Alignment LEDs for single person alignment.
IP Rating:	IP54 (Controller) IP66 (Transmitter/Receiver)
Relative Humidity (non-condensing):	93%
Parts List (System):	1 x Transmitter (clear lens) 1 x Receiver (dark lens) 1 x Control Unit 1 x Fixing Kit 2 x Brackets
Parts List (Additional Detector):	1 x Transmitter (clear lens) 1 x Receiver (dark lens) 1 x Fixing Kit 2 x Brackets
Housing Material	
(Controller):	UL94 V2 PC
(Transmitter/Receiver):	Copper Free Aluminium Alloy LM25, red
(Bracket):	Steel, red
Cable Gland Entries:	3 x 20mm
Peppers E3WBF Exd Cable Gland	E - Type of gland featuring armour specific clamping 3 - Silicone W - SWA B - Brass F - Multiple Certification
ATEX Approval	SIRA I5ATEX I260 IECEX SIR I5.0089
Vds	EN54 Part I2

All figures are quoted for 25°C

Alarm & Operation Thresholds	Min	Type	Max
Delay to Alarm/Fault (selectable in 1 sec steps):	2s	10s	30s
Laser Time-out (selectable in 1 min steps):	1 min	5min	59min
Response Sensitivity/Threshold (selectable in 1% steps):	25%	35%	60%

Weight

Control Unit:	606g
Transmitter & Receiver (Inc. Brackets):	3.7kg



Fireray 3000 Exd - PN: **3000-115**

Fireray 3000 Exd Detector Pack - PN: **3000-026**

Installation Recommendations

Please refer to the User Guide (UG) for mounting, wiring and commissioning instructions. The installation of the 3000 Exd infrared optical beam smoke detector should be undertaken in accordance with the recognised national, or international, standards and Codes of Practice (COP).

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Fireray® 5000

Motorised Reflective Auto-Aligning Beam Smoke Detector

The Fireray® 5000 motorised reflective, auto aligning infra-red beam smoke detector can be installed with up to two detector heads per system, thus saving on installation time and costs. In addition, each system controller houses two pairs of fire and fault relays, one per detector. This innovative system has been designed from the ground up to include pioneering technology that fully addresses the needs of the installer and user, both now and in the future.

With its industry leading optics, the Fireray® 5000 is ideally suited for the protection of large areas where the use of traditional detection technologies would prove to be too difficult and/or costly to install.

The Fireray® 5000 combines an infra-red transmitter and receiver in the same discrete unit and operates by projecting a well-defined beam to a reflective prism, which returns the beam to the receiver for analysis. Smoke in the beam path causes a drop in power, which, if below a pre-determined level, results in an alarm signal.

Features

- Allows for 2 detectors per system controller
- Each detector configurable from 8m to 100m
- Separate fire and fault relays per detector
- Integral LASER alignment
- Auto-Align fast automatic beam alignment
- Contamination compensation
- Low level system controller
- Logs the 50 most recent events per detector
- Programmable sensitivity and fire thresholds
- 20mm cable gland knock-outs on system controller
- 2-wire interface from system controller to detector
- Working optical path for detector alignment

Approvals:

World-wide approvals include EN54:12 and UL268.
Visit www.ffeu.com for up to date approvals information.



Operation

Getting the system operational is simplified by a number of ground breaking features that combine to make the Fireray® 5000 the quickest and easiest detector of its type to install. Each detector takes under 5 minutes to fully align.

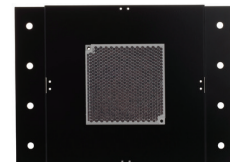
A full range of installation accessories are available including the new Adjustment Bracket, which allows a greater degree of flexibility during installation.

Once the detector heads are connected, using the Easifit First-Fix system, an integral LASER can be activated. This allows the reflective prism to be positioned quickly and with confidence. Once the LASER has been used to coarsely align the beam, Auto-Align takes over and automatically steers the beam into the optimum position. During alignment the system automatically switches to high current mode and drops back to low current mode when in normal operation, however, alignment is still possible in low current mode.

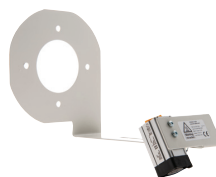
Fireray® 5000 Accessories



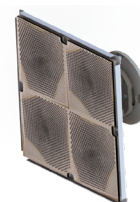
Adjustment Bracket
PN: 5000-201



Reflector Wall Bracket
PN: 1031-000



Anti-Condensation Heater
PN: 5000-204



4 Reflector Adjustment Bracket
PN: 1050-000

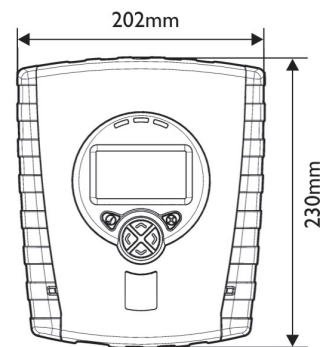
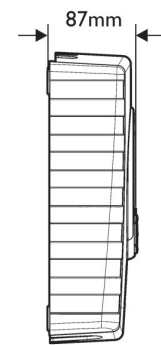
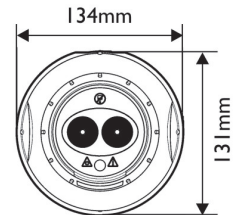
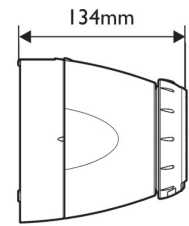


Protective Wire Cage
PN: 1000-018

Fireray[®] 5000

Technical Specification

Parameter	Min.	Typ.	Max.	Unit
Operating Voltage (to System Controller)	14	-	36	VDC
Operating Current (constant) - with 1 detector	5	5.5	6	mA
Operating Current (constant) - with 2 detectors	7.5	8	8.5	mA
Operating Current (constant) - alignment modes, with 1 or 2 detectors	35	36	37	mA
Response Threshold/ Sensitivity (Default 35%)**	0.45 10	- -	3.98 60	dB %
Delay to Alarm – user settable (Default 10 sec)	2	-	30	sec
Delay to Fault – user settable (Default 10 sec)	2	-	30	sec
Operating distance (separation)*	8	-	100	m
Maximum angular alignment of detector	-	-	±3.5	°C
Optical wavelength 850 nm				
Fault level/ Rapid obscuration ($\Delta \leq 2$ sec)	-	-	87	%
Operating temperature	-10	-	+55	°C
Storage temperature	-40	-	+85	°C
Relative humidity (non condensing)	-	-	93	%
IP rating		54		-
Contact Voltage - Fire & Fault relays (VFCO)	0.1	-	36	VDC
Contact Current - Fire & Fault relays (VFCO)	0.1	-	100	mA
Cable length - System Controller to Detector (2 core)	-	-	100	m
Cable gauge	24 0.5	- -	14 1.6	AWG mm
Housing flammability rating	UL94 V0			
CPR Reference	0832-CPR-F0390			
UL File	S3417			



Dimensions and Weight

	Width mm	Height mm	Depth mm	Weight kg
System Controller, including base:	202	230	87	1.0
Detector, including 'easy fit' base: 1	134	131	134	0.5
Reflector:	100	100	10	0.1

All figures are quoted for 25°C

* 4 Reflectors required for > 50 m operation.

**To comply with EN54:12 set sensitivity levels between 25 & 30% with a maximum delay to fire of 20 seconds.

Installation Recommendations

Please refer to the User Guide (UG) for mounting, wiring and commissioning instructions. The installation of the Fireray[®] 5000 infra-red beam smoke detector should be undertaken in accordance with the recognised national, or international, standards and Codes of Practice (COP).

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Fireray One

With no specialist tools or knowledge needed for installation and operation, the Fireray One is a standalone beam detector that prioritises ease of installation.

Using the Fireray One, it couldn't be easier to bring the benefits of beam detection to your application:

- Auto-Aligns – just steer the laser onto the Reflector, then at the flick of a switch, it aligns itself. 8 times faster than previous detectors
- One person installation – everything can be done by one person
- One standalone product – no specialist tools required; minimal prior knowledge and training needed

Application	Challenge	Fireray One
Small warehouses	Cost effective protection	A standalone beam detector with all the benefits of Fireray Reflective beam detection
	Simple installation	Single point of wiring and commissioning
New buildings	Settling of the building can cause other beam detectors to misalign and result in nuisance alarms	Building Movement Tracking™ automatically compensates for natural building movement to continuously maintain alignment*



Technical specification

Detection performance	
Detection range	0 to 50m 0 to 120m with Reflective Long Range Kit
Alignment method	Laser assisted, Auto-Alignment™. Manual alignment – optional setting
Auto-Alignmen protocol	Background check, Box search, Adjust and Centre
Building Movement Tracking™	Compensates for natural shifts in alignment from building movement*
Contamination Compensation	Compensates for gradual build-up of contamination on the optical surfaces
Light Cancellation Technology™	Compensates for high levels of sunlight and artificial lighting
Optical wavelength – smoke detection	850nm near infrared (invisible)
Integrated laser – laser alignment	650nm visible. Class IIIa <5mW
Dynamic Beam Phasing	Allows beam detectors to be mounted facing each other with the reflectors in the middle. Eliminates false alarms caused by crosstalk between beams
Signal output	Individual Alarm and Fault relays (VFCO) 2A @ 30 VDC
Programmable user settings	
Alarm response threshold levels	25% (1.25dB) – Fastest response to smoke 35% (1.87dB) – Default value 55% (3.46dB) – High immunity to false alarms, slow response to smoke 85% (8.23dB) – Highest immunity to false alarms, slowest response to smoke Configured via the integrated user interface
Delay to Alarm	10 seconds, for momentary partial obstruction of the beam path
Delay to Fault	10 seconds, for momentary obstruction of the beam path
User features	
Integrated user interface	Alignment mode switch, alignment directional buttons and configuration switches for alarm response threshold
Alignment status indication	2 Green LEDs and 1 Yellow LED
System status indication	Normal operation – Green LED flashing every 10 seconds Alarm condition – Red LED flashing every 5 seconds Fault condition – Yellow LED flashing every 10 seconds for obscuration or every 5 seconds for contamination
Cleaning	Flat front face with enclosed optics. Cleaning the optics does not affect alignment

Design parameters	
Separation distance between Detector and Reflector	5 to 50m
	50 to 120m with Reflective Long Range Kit
Beam path clearance	1m in diameter from centre line between Detector and Reflector
Detector dimensions	Width 130mm x Height 181mm x Depth 134mm (see diagram)
Reflector dimensions	Up to 50m separation distance – Single reflector 100mm x 100mm x 9mm Up to 120m separation distance – Four reflectors arranged in a square pattern 200mm x 200mm x 9mm
Product weight	Detector – 0.7kg; Reflector – 0.1 kg
Multi-detector arrangement	Dynamic Beam Phasing allows for Detectors to face each other with the reflectors in the middle
Housing colour	White RAL9016, UV stable

Electrical specifications	
Operating voltage	14 to 36 VDC
Operating current (constant) all operational modes	All operational modes – 5mA; Fast alignment mode – 33mA

Field wiring	
Cable gauge and type	2 core, dedicated, 0.5 to 1.6mm (24 to 14 AWG) System compatible with fireproof and non-fireproof cable meeting local installation standards
Cable entry	3 knock-out locations capable of accepting M20, ½" or ¾" glands 4 drill-out locations capable of accepting glands up to 21 mm diameter

Test and maintenance	
Alarm test	Optical alarm test using Commissioning and Maintenance Kit accessory

Environmental specifications	Optical specifications
Operating temperature: -20 to +55°C	Fault level / Rapid obscuration ($\Delta \leq 2$ seconds): $\geq 85\%$
Storage temperature: -40 to +85°C	Maximum angular alignment of Reflective Detector: $\pm 4.5^\circ$ ($\pm 70^\circ$ with adjustment bracket accessory)
Relative humidity (non-condensing or icing): 0 to 93%	Maximum angular misalignment of Reflective Detector: $\pm 0.5^\circ$
IP rating: IP55	Maximum angular misalignment of Reflector: $\pm 5^\circ$
Housing flammability rating: UL94 V0 polycarbonate	

All figures are quoted for 25°C

Ordering information	
Part number	Description
6010-100	Fireray One – 50m detection range
1010-000	Reflective Long Range Kit – 120m detection range

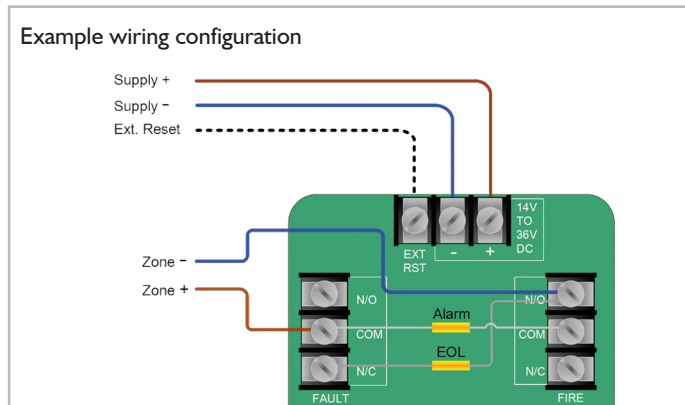
Accessories	
1150-000	Commissioning and Maintenance Kit
1170-000	Reflective Detector adjustment bracket
1100-000	Fireray One Protective cage
1040-000	Single Reflector Adjustment Bracket
1050-000	4 Reflector Adjustment Bracket
1030-000	Reflector wall bracket - white
1031-000	Reflector wall bracket - black
1060-000	Fireray One Anti-condensation heater
1090-000	Reflector Anti-condensation heater
1260-000	Fireray One Back Box

Approvals
UL268
2831-CPR-F2237
Vds G 218070

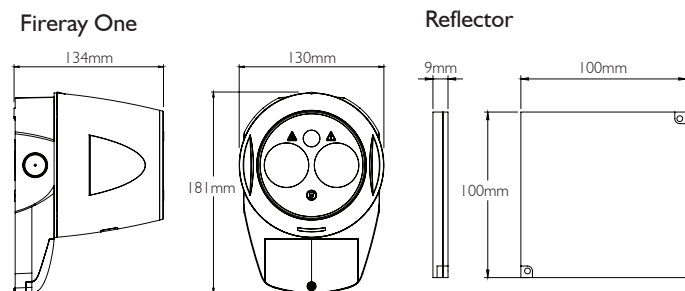


Patents:
Light Cancellation Technology™ Patent No. GB2513366
Dynamic Beam Phasing Patent pending
Auto-Alignment™ Patent pending

*When mounted according to manufactures guidelines.



Dimensions



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