



BARTER GROUP
FIRE PROTECTION
SOUTH AFRICA

OPERATOR MANUAL

BG-IR3

Point-Type Infrared Flame Detector

Version V1.0



BG-IR3 Point-Type Infrared Flame Detector

Product	BG-IR3 Point-Type Infrared Flame Detector
Document	Operator Manual
Version	V1.0
Issued by	Barter Group Fire Protection South Africa

Important Notices and Safety Warnings

Thank you for choosing the Barter Group BG-IR3 flame detector. Please read this manual carefully before installing, operating or maintaining the detector.

This manual describes the scope of application, installation methods, operating procedures and safety precautions for the BG-IR3 flame detector. All personnel responsible for designing, installing, operating or maintaining the detector must read and fully understand this manual before proceeding.

WARNING Safety Warnings

- All installation and wiring must comply with the applicable national standards and regulations.
- Internal work on the detector must be carried out only by personnel authorised by the manufacturer.
- Do not attempt to modify the detector. Unauthorised modifications will void the warranty and may cause irreversible damage.

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1. Product Overview

The BG-IR3 is a three-band infrared flame detector (referred to in this manual as “the detector”). It was developed through years of field data collection and installation experience, and it offers stable fire-detection capability combined with a broad range of interface options. Its well-considered structural design simplifies installation and wiring. A 360° adjustable mounting bracket allows the detection angle to be optimised during commissioning and during later maintenance.

Multi-band infrared flame detection is one of the most effective technologies for early fire warning. By detecting the characteristic infrared radiation emitted by flames, the detector responds more rapidly than conventional smoke or heat-based detection methods. This is particularly true in open or outdoor environments, where warning times are significantly reduced.

High-performance infrared sensors, an integrated microprocessor and advanced signal-processing algorithms enable the detector to distinguish genuine flame radiation reliably from interference sources such as artificial lighting, air-conditioning units and direct sunlight. This minimises false alarms while maintaining a rapid response to real fire events.

2. Main Features

- A high-performance, high-speed, low-power, anti-interference data-processing chip.
- Three infrared sensors with complementary spectral coverage for optimal detection performance.
- A dual-colour LED indicator (up to 22,000 mcd) that provides clear, instant status indication.
- A multi-functional interface that supports a switching-contact output, a 4–20 mA analogue output, RS485 serial communication and a 24 V active or passive switchable relay output.
- Built-in multi-stage protection against over-current, over-voltage, electrostatic discharge and lightning surges.
- An advanced detection algorithm that provides an optimum balance between detection sensitivity and false-alarm rejection.
- Compatibility with a wide range of fuel types and combustion scenarios.
- An explosion-proof design certified for use in industrial hazardous areas.
- A high-quality precision screw-terminal block with separator plates and a hinged cover for neat cable management. The terminal block is rated for insulation from –40 °C to +120 °C and accepts standard screw connections.

3. Technical Parameters

Parameter	Specification
Electrical	
Supply voltage	24 V DC
Monitoring current	≤ 25 mA
Alarm current	≤ 55 mA
Cable entry (electrical interface)	M20 × 1.5
Outputs	
Relay outputs	Two relay contact outputs
Fire relay contact rating	2 A / 30 V DC; 1 A / 125 V AC
Signal relay contact rating	2 A / 24 V DC; 2 A / 120 V AC
Analogue output	4–20 mA
4–20 mA monitoring current	5 mA (adjustable)
4–20 mA alarm current	20 mA (adjustable)
Serial communication	Standard RS485 (user protocol)
Indication	
Normal condition	Green LED steady (flashes for 5 seconds at power-on)
Alarm condition	Red LED steady
Detection	
Spectral range	3.8–11 μm
Field of view	90°
Sensitivity level	Level I
Detection range	33 × 33 cm alcohol fire, or 25 m n-heptane fire; alarm within 30 seconds
Applicable standard	GB 15631-2008
Environmental and protection	
Operating temperature	–40 °C to +70 °C
Storage temperature	–40 °C to +80 °C
Operating humidity	0–93 ± 3 % RH (non-condensing)
Explosion protection	Exdb IIC T6 Gb
Ingress protection	IP66
Physical	
Housing material	Metal
Dimensions (L × W × H)	152 × 111 × 130 mm
Weight	1.6 kg

4. Installation and Fixing

WARNING Before Installation

- Disconnect the power from the detector supply circuit before beginning installation.
- All wiring must comply with the applicable standards and regulations.
- Inspect all external cables for open-circuit and short-circuit faults before connecting them.
- All wiring conductors must have a minimum cross-section of 1.0 mm². Strip approximately 6 mm of insulation from the cable ends before connecting them to the detector terminals.
- Insufficient or excessive conductor exposure may result in incorrect or unreliable connections.



Terminal wiring guidance: strip approximately 6 mm (1/4 in) of insulation

4.1 Detector Dimensions

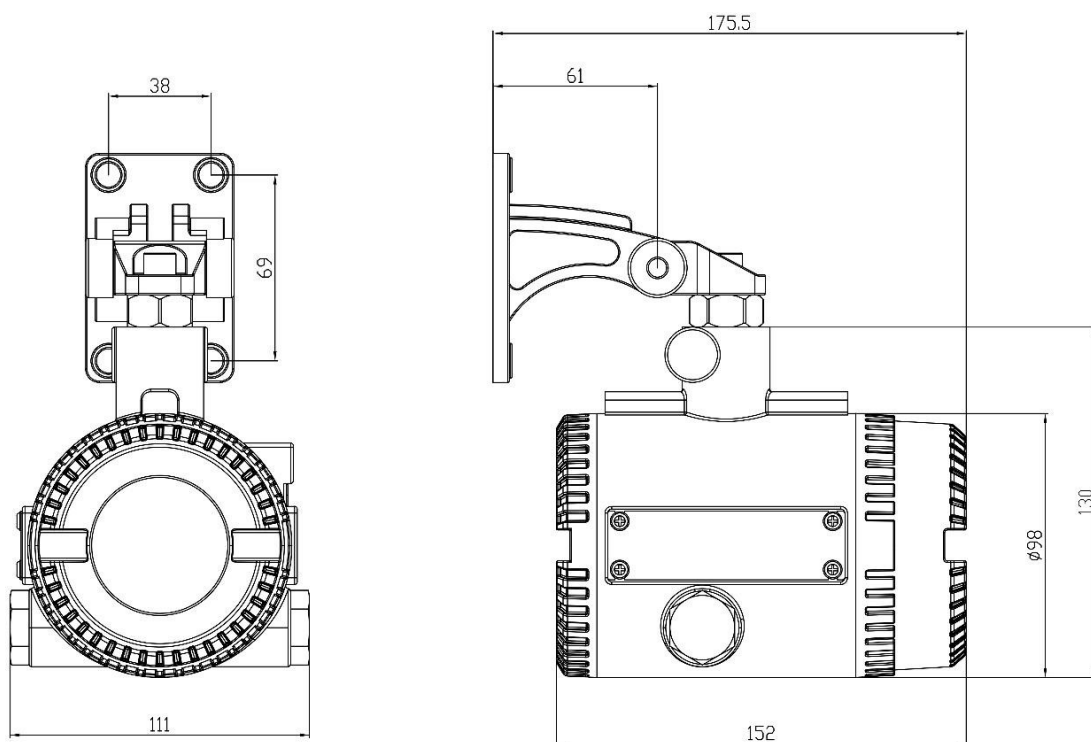


Figure 4.1: Detector profile and dimensions (mm)

4.2 Mounting Bracket Dimensions

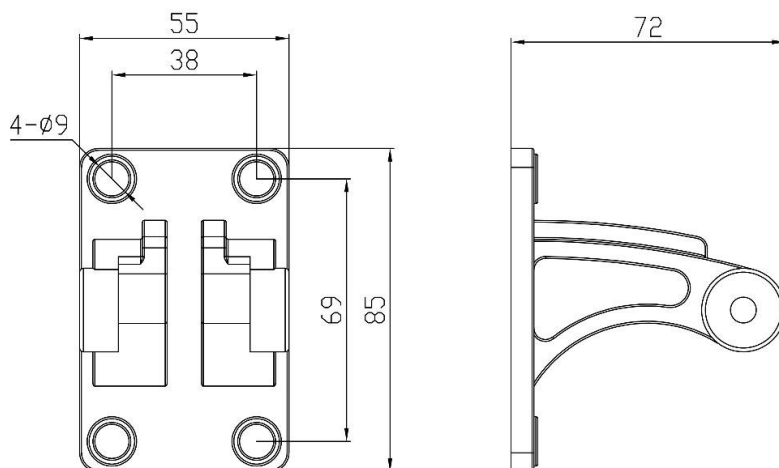


Figure 4.2: Optional mounting bracket drawing (mm)

4.3 Installation Methods

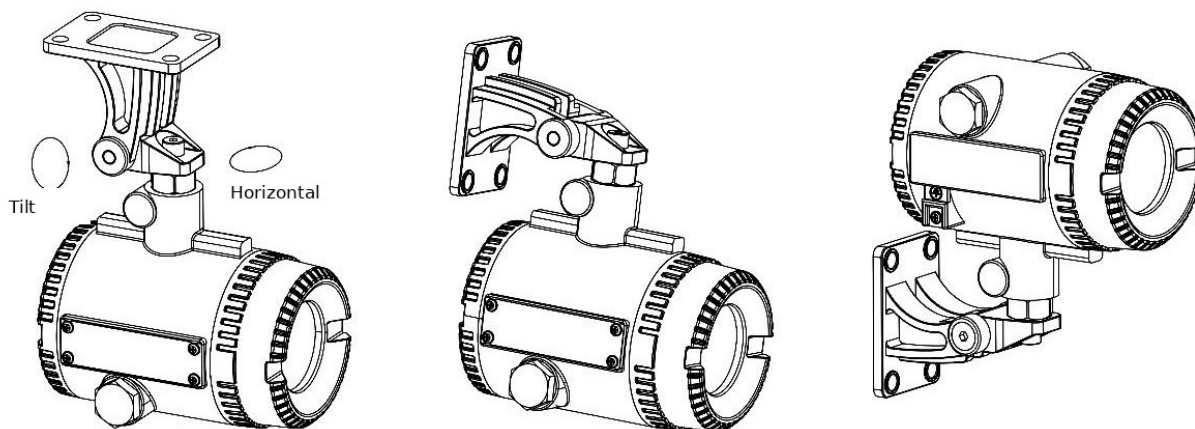


Figure 4.3: Ceiling (flush) mount, wall mount (option 1) and wall mount (option 2)

The detector may be mounted on a wall, on a ceiling or on a dedicated fixing frame. Select the installation height and position according to the sensitivity level of the detector and the characteristics of the fire risk being monitored. The minimum recommended distance between the detector and the monitored target is 1.5 m.

4.4 Installation Requirements

Minimise obstructions within the detection field. Where obstacles with horizontal or vertical dimensions not exceeding 0.5 m are unavoidable, maintain a clearance of at least 2.5 m between the detector and the obstacle. Where obstructions larger than 0.5 m cannot be avoided, increase the number of detectors accordingly.

1. The detector chassis must be reliably connected to a protective earth (PE) conductor. The grounding point is on the right side of the detector. The earth resistance must not exceed 4 Ω .
2. All conduit connections at the detector cable entry must be sealed. The mating threads between the sensor and the housing, and between the housing cover and the body, must be fully engaged and sealed.
3. The detector supply and signal cables must not be routed in the same conduit as AC power cables.
4. Do not mount the detector directly on, or adjacent to, heat or vibration sources.
5. Wherever possible, shield the detection zone from intense thermal radiation, artificial light sources and direct sunlight.

5. Wiring Schematic

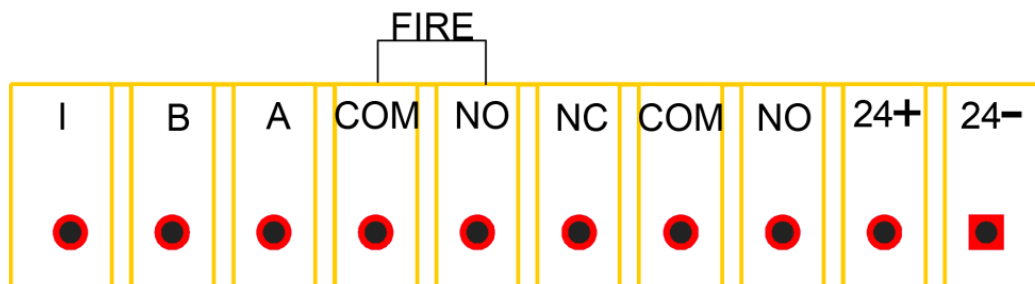


Figure 5.1: Terminal wiring diagram

The terminal designations are as follows:

Terminal	Description
24V+ / 24V-	DC 24 V power supply input
24V+ / 24V- / I	4–20 mA analogue current signal output
A / B	Standard RS485 communication lines
FIRE COM / NO	Fire alarm relay: normally open contact
NC / COM / NO	Auxiliary relay: normally closed, common and normally open contacts (active or passive, selectable)

6. Packaging, Storage and Handling

Flame detectors are packed in foam-lined boxes. Handle the boxes with care during loading and unloading. Impact or shock may damage the protective cover glass and the internal electronic components.

Store the detector in a clean, dry environment. Avoid locations with high salt spray or excessive moisture, as these conditions may cause corrosion. Any unit that has been stored for more than three months must be retested, and a test report must be issued by the manufacturer, before the unit is placed into service.

7. Acceptance Test

CAUTION Prior to Testing

Notify the relevant facility management department before conducting any acceptance test. Temporarily disable the logical control functions of the area or system under test to prevent unintended alarm activation.

The detector must be tested immediately after installation and after each maintenance period.

1. Apply power to the detector. The detector enters the monitoring state, and the green LED should illuminate steadily (it flashes for approximately 5 seconds during power-on initialisation). If the green LED does not illuminate, check the wiring and the supply voltage. If the fault persists, return the unit for repair.
2. Use a controlled flame source, such as a short-range alcohol lamp or burning paper, as the test fire source. Have appropriate fire-extinguishing equipment ready before testing. Simulate a fire condition until the detector activates an alarm (red LED steady and relay output active).
3. When the test is complete, notify the facility management department so that the system can be restored to normal operation. If the detector fails the acceptance test, it must be returned for inspection and repair.

WARNING Internal Changes

For internal configuration changes or special application requirements, contact Barter Group after-sales support. Unauthorised modifications will cause irreversible damage to the performance of the detector.

8. Common Fault Handling

No	Symptom	Probable cause	Corrective action
1	Monitoring indicator not illuminated	Power cable incorrectly connected	Check the power supply terminals for wrong, loose, reversed or missing connections.
		No power supplied	Connect the power supply and verify the supply voltage.
2	No output signal after alarm	Incorrect output wiring	Check the output wiring. If the fault persists, contact Barter Group after-sales support.
		Open circuit on output line	Inspect and repair the output line.
3	Detector illuminated but does not alarm during test	Incorrect test angle or distance	Ensure that the test fire source is within the detection range (see Section 3, Technical Parameters).
		Incorrect test method	For simulation tests, reduce the test distance in proportion to the flame size. A flame flicker frequency of at least 5 Hz is required. Use an alcohol lamp, a candle or burning A4 paper.
4	Frequent false alarms after power-on	Sensor sensitivity unsuitable for the environment	Contact Barter Group to restore the factory settings.
		Environmental interference	Eliminate sources of interference and avoid direct sunlight on the detector.
		Protective cover not properly secured	Sensors exposed without the cover are susceptible to radiation interference. Ensure that the cover is firmly tightened.

9. Maintenance

The detector must be maintained in accordance with the applicable national standards and regulations.

NOTE Maintenance Schedule

- Clean the detector at least once a year.
- Perform functional testing and maintenance at least once a month.

Maintenance procedure

1. Notify the facility management department and temporarily disable the logical control functions of the area or system being maintained to prevent unintended alarm activation.
2. Remove dust and debris from the front face of the detector using a vacuum cleaner or compressed air.
3. If the lens shows oil contamination or stubborn dirt, clean it gently with a soft cotton cloth lightly moistened with alcohol. Do not use abrasive materials or hard objects that could scratch the lens surface.
4. After cleaning all detectors, perform a functional test using the procedure in Section 7, Acceptance Test.

CAUTION Handle the Lens with Care

The protective cover lens is made from a specialised crystal material. It has a soft surface and is valuable and fragile.

10. Accessories

Each BG-IR3 detector is supplied as a complete package containing:

- One (1) BG-IR3 flame detector
- One (1) operator manual
- One (1) certificate of conformity
- One (1) factory inspection report
- One (1) packing list
- One (1) mounting bracket set (refer to the packing list for details)

11. Warranty and Support

The product warranty period is one year from the date of manufacture (excluding the protective cover glass). Failures that occur under normal use within the warranty period are eligible for free factory repair and maintenance services. Damage resulting from misuse, physical abuse or natural disasters is excluded from warranty coverage.

For technical support, after-sales service or further information, please contact Barter Group:

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