



GENERAL MONITORS
Protection for life.

MODEL FL4000H

Multi-Spectrum Infrared Flame Detector



Features

- Multi-Spectrum IR (MSIR) Sensor Array
- Neural Network Technology (NNT)
- Continuous Optical Path Monitoring (COPM)
- Multiple Communication Outputs
- Event Logging
- Test Mode

Benefits

- Increased range and wide field of view
- Provides superior false alarm immunity
- Checks optical path integrity and detector's electronic circuitry
- Versatile for use in a variety of applications
- Standalone diagnostic tool
- Used to check all outputs (used with test lamp)

Description

The Model FL4000H is an advanced multi-spectrum flame detector designed to provide superior false alarm immunity with the widest field of view. The FL4000H employs a state-of-the-art multi-spectrum infrared (MSIR) sensor array with a sophisticated Neural Network Technology (NNT) system. The FL4000H is designed to detect typical fires such as those produced by alcohol, n-heptane, gasoline, jet fuels and hydrocarbons. In addition, the FL4000H can see through dense smoke produced by diesel, rubber, plastics, lube oil, and crude oil fires.

The NNT flame discrimination algorithm classifies the output signals from the MSIR sensor array as either fire or non-fire. The MSIR/NNT combination is highly immune to false alarms caused by lightning, arc-welding, hot objects, and other sources of radiation.

The FL4000H's electronics are housed in a stainless steel explosion-proof enclosure. The detector is available with the following output configurations:

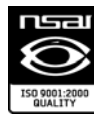
- 4-20 mA stepped output
- Dual serial communications
- HART communication
- Warning, alarm and fault relays

The serial communication port(s) allows 128 units (247 using repeaters) to be linked up to a host computer using the Modbus RTU protocol. The communication registers provide alarm status, fault and other information for operating, troubleshooting or programming the unit.

The COPM (Continuous Optical Path Monitoring) self test checks the optical path integrity (window cleanliness) and the detector's electronic circuitry every two minutes.

Applications

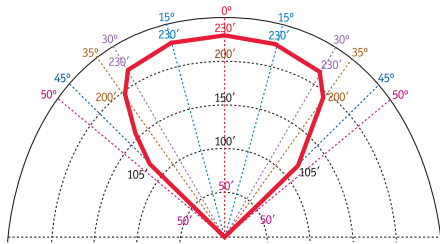
- Drilling and Production Platforms
- Gas Turbines
- LNG/LPG Processing and Storage Facilities
- Fuel Loading Facilities
- Compressor Stations
- Electrostatic Paint Spray Booths
- Aircraft Hangars
- Refineries
- Chemical Plants



MODEL FL4000H

System Specifications

Spectral Range: 2 - 5 microns (IR)
Maximum Range: 230 ft. (70 m)*
Typical Response Time: < 10 s
Minimum Arc Welding Immunity Distance: 5-15 ft. (1.5-4.6 m) depending on rod
Maximum Field of View: 100° @ 100 ft; 90° @ 210 ft. †



* 1 sq. ft. n-heptane fire using high sensitivity. This is a nominal value and different results may arise depending on the source of each fire.

† Maximum field of view is the angle at which FL4000H can detect flame at 50% of maximum specified range.

Accessories: Test lamp, mounting bracket
Classification: Class I, Div. 1, Groups B, C, D; Class II, Div. 1, Groups E, F, G; Class III II 2GD Ex d IIC T5 Gb Ex tb IIIC T100°C Db
Warranty: Two years
Approvals: CSA, FM, ULC, ATEX, IECEx & CE Marking. HART registered. SIL 3 suitable. FM certified to IEC 61508.

Environmental Specifications

Operating/Storage Temperature Range:
 -40°F to +176°F
 (-40°C to +80°C)
Operating Humidity Range:
 0% to 95% RH, non-condensing

Mechanical Specifications

Housing: 316 stainless steel
Height: 4.3 inches (109 mm)
Diameter: 5.4 inches (137 mm) base
 3.5 inches (89 mm) optical housing
Weight: 7.9 lbs. (3.6 kg)
Mounting: Stainless steel mounting bracket
Cable Entry: 2 x 3/4 inch NPT

Electrical Specifications

Input Power: 20-36 VDC
 24 VDC @ 150 mA (3.6 W)
Analog Signal: 0-20 mA (600 Ohms maximum)
 3.5-20 mA (HART)
Fault Mode: 0 mA to 0.2 mA
Test Mode: 1.5 mA, ± 0.2 mA
COPM Fault: 2 mA, ± 0.2 mA
Ready Mode: 4.3 mA, ± 0.2 mA
WARN Mode: 16 mA, ± 0.2 mA
ALARM Mode: 20 mA, ± 0.2 mA
Relay Contact Rating: 8A @ 250 VAC, 8A @ 30 VDC resistive maximum
RF/EMI Protection: Complies with EN6100-6-4: 2001 and EN50130-4: 1995+A2: 2003
Selectable Options: Sensitivity: High, Medium or Low
 Alarm Time Delay: up to 14 seconds with dip switches and up to 30 seconds with Modbus
 Warn & Alarm Relays: Latching/Non-Latching Energized/De-Energized
RS-485 Output: Modbus RTU, suitable for linking up to 128 units and 247 units with repeaters
Baud Rate: 2400, 4800, 9600, 19200, or 38400 bit/s
HART: HART 6, HART Device Description Language available. AMS Aware
Status Indicators: Two LEDs with status and fault cues
Fault Monitoring: RAM, EPROM and EEPROM checksum errors, optics failure/blockage and low supply voltage
Cable Requirements: 3 wire shielded cable minimum configuration. Maximum distance between FL4000H and power source or remote sensor @ 24 VDC nominal (20 Ohm loop):
 14 AWG - 4,500 ft (1,370 m)
 Max. distance for analog output (250 Ohms max):
 14 AWG - 9,000 ft. (2,750 m)
Standard Configuration: FL4000H-1-0-1-3-1-1-1
 Dual Modbus, no relays, 0 - 20 mA, high sensitivity, 10 second delay, mounting bracket

Specifications subject to change without notice.

Represented by:

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General Monitors Worldwide



www.generalmonitors.com
www.FL4000.com

Lake Forest, CA

26776 Simpatica Circle
 Lake Forest, California 92630
 Tel: +1-949-581-4464
 Fax: +1-949-581-1151
 Email: info@generalmonitors.com

Houston, TX

9776 Whithorn Drive
 Houston, Texas 77095
 Tel: +1-281-855-6000
 Fax: +1-281-855-3290
 Email: gmlhou@generalmonitors.com

Ireland

Ballybrit Business Park
 Galway
 Republic of Ireland
 Tel: +353-91-751175
 Fax: +353-91-751317
 Email: info@gmil.ie

Singapore

No. 2 Kallang Pudding Road
 #09-16 Mactech Building
 Singapore 349307
 Tel: +65-6748-3488
 Fax: +65-6748-1911
 Email: genmon@gmpacifica.com.sg

United Arab Emirates

P.O. Box 61209
 Jebel Ali
 Dubai
 United Arab Emirates
 Tel: +971-4-8143814
 Fax: +971-4-8857587
 Email: gmmme@generalmonitors.ae

United Kingdom

Heather Close
 Lyme Green Business Park
 Macclesfield, Cheshire
 United Kingdom, SK11 0LR
 Tel: +44-1625-619583
 Fax: +44-1625-619098
 Email: info@generalmonitors.co.uk