



GENERAL MONITORS
Protection for life.

MODEL FL4000

Multi-Spectral Infrared Flame Detector



Features

- Multi-Spectral 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 FL4000 is an advanced multi-spectral flame detector designed to provide superior false alarm immunity with the widest field of view. The FL4000 employs a state-of-the-art multi-spectral infrared (MSIR) sensor array with a sophisticated Neural Network Technology (NNT) system. The FL4000 is designed to detect typical fires such as those produced by alcohol, n-heptane, gasoline, jet fuels and hydrocarbons. In addition, the FL4000 can see through dense smoke produced by diesel, rubber, plastics and lube 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 FL4000'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 FL4000

System Specifications

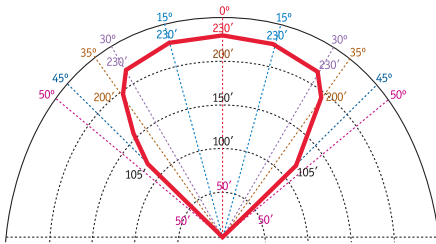
Spectral Range: 2 - 5 microns (IR)

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 FL4000 can detect flame at 50% of maximum specified range.

Accessories: Test lamp, mounting bracket

Classification: Class I, Div. 1, Groups B, C & D (includes Zones 1 and 2); Class II, Div. 1, Groups E, F & G; Class III
Type 6P Enclosure, IP67
II 2GD Ex d IIC T5

Warranty: Two years

Approvals: CSA, FM, ULC, ATEX, VNIPO & CE Marking. HART registered. SIL 3 suitable.

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: 6.26 inches (159 mm)

Diameter: 3.5 inches (89 mm)

Weight: 6.9 lbs. (3.1 kg)

Mounting: Stainless steel mounting bracket

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+A1: 1998

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 FL4000 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: FL4000-1-5-1-3-1-1-1
Dual MODBUS, no relays,
0 - 20 mA, high sensitivity,
10 second delay, mounting bracket

Specifications subject to change without notice.

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