

# Model **FL4000H**

Multi-Spectrum Infrared Flame Detector



**General Monitors**



## Applications

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

## Features & Benefits

- Multi-Spectrum IR (MSIR) Sensor Array provides increased range and wide field of view
- Neural Network Technology (NNT) offers superior false alarm immunity
- Continuous Optical Path Monitoring (COPM) checks optical path integrity and detector's electronic circuitry
- Multiple communication outputs offer versatility for use in many applications
- Event logging for stand-alone diagnostic tool
- Test mode (with test lamp) is used to check all outputs

## Description

The General Monitors 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
- HART communication
- Dual serial communications
- Warning, alarm and fault relays

The serial communication port(s) allows 128 units (247 using repeaters) to be linked to a host computer using 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 optical path integrity (window cleanliness) and the detector's electronic circuitry every two minutes.



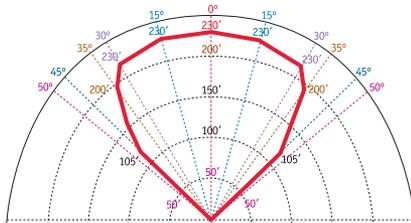
**The Safety Company**

*Because every life has a **purpose...***

System Specifications	
<b>SPECTRAL RANGE</b>	2 – 5 microns (IR)
<b>MAXIMUM RANGE</b>	230 ft. (70 m)*
<b>TYP. RESPONSE TIME</b>	≤ 10 s
<b>MIN. ARC WELDING IMMUNITY DISTANCE</b>	5-15 ft. (1.5-4.6 m) depending on rod
<b>MAX. FIELD OF VIEW</b>	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.



<b>ACCESSORIES</b>	Test lamp, mounting bracket
<b>CLASSIFICATION</b>	Class I, Div 1, Groups B, C, D Class II, Div 1, Groups E, F, G Class III, Type 6P Ex d IIC T5 Gb Ex tb IIIC, T100°C Db, IP66/67 HART Registered SIL 3 Suitable (FM)
<b>WARRANTY</b>	Two years
<b>APPROVALS</b>	CSA, FM, ULC, ATEX, IECEx, EN 54-10, MED, DNV-GL, VNIPO, GOST, Inmetro, CE

Environmental Specifications	
<b>OPERATING/STORAGE TEMPERATURE RANGE</b>	-40° F to +176° F (-40° C to +80° C)
<b>OPERATING HUMIDITY RANGE</b>	10% to 95% RH, non-condensing

Mechanical Specifications	
<b>HOUSING</b>	316 stainless steel
<b>HEIGHT</b>	4.3" (109 mm)
<b>DIAMETER</b>	5.4" (137 mm) base 3.5" (89 mm) optical housing
<b>WEIGHT</b>	7.9 lbs (3.6 kg)
<b>MOUNTING</b>	Stainless steel mounting bracket
<b>CABLE ENTRY</b>	2 x 3/4" NPT

Electrical Specifications	
<b>INPUT POWER</b>	20-36 VDC 24 VDC @ 150 mA (4.4 W)
<b>ANALOG SIGNAL</b>	0-20 mA (600 ohms maximum) 3.5-20 mA (HART)
<b>FAULT MODE</b>	0 mA to 0.2 mA
<b>TEST MODE</b>	1.5 mA, ± 0.2 mA
<b>COPM FAULT</b>	2 mA, ± 0.2 mA
<b>READY MODE</b>	4.3 mA, ± 0.2 mA
<b>WARN MODE</b>	16 mA, ± 0.2 mA
<b>ALARM MODE</b>	20 mA, ± 0.2 mA
<b>RELAY CONTACT RATING</b>	8A @ 250 VAC, 8A @ 30 VDC resistive maximum
<b>EMC</b>	Complies with EN 61000-6-4 and EN 50130-4
<b>SELECTABLE OPTIONS</b>	SENSITIVITY: High, Medium or Low ALARM TIME DELAY: up to 14 seconds with dip switches and up to 30 seconds with Modbus
<b>WARN &amp; ALARM RELAYS</b>	Latching/Non-Latching Energized/De-Energized
<b>RS-485 OUTPUT</b>	Modbus RTU, suitable for linking up to 128 units and 247 units with repeaters
<b>BAUD RATE</b>	2400, 4800, 9600, 19200, or 38400 bit/s
<b>HART</b>	HART 6, HART Device Description Language available. AMSaware
<b>STATUS INDICATORS</b>	Two LEDs with status and fault cues
<b>FAULT MONITORING</b>	RAM, EPROM and EEPROM checksum errors, optics failure/blockage and low supply voltage
<b>CABLE REQUIREMENTS</b>	3 wire shielded cable minimum configuration Maximum distance between FL4000H and power source or remote sensor @ 24 VDC nominal (20 ohm loop): 14 AWG - 3,000 ft (930 m) Maximum distance for analog output (250 ohms max): 14 AWG - 9,000 ft. (2,750 m)
<b>STANDARD CONFIGURATION</b>	<b>FL4000H-1-0-1-3-1-1-1</b> Dual Modbus, no relays, 0 - 20 mA, high sensitivity, 10 second delay, mounting bracket

Note: This Bulletin contains only a general description of the products shown. While uses and performance capabilities are described, under no circumstances shall the products be used by untrained or unqualified individuals and not until the product instructions including any warnings or cautions provided have been thoroughly read and understood. Only they contain the complete and detailed information concerning proper use and care of these products. Specifications subject to change without notice.



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**Corporate Headquarters:**  
**MSA**  
1000 Cranberry Woods Drive  
Cranberry Township, PA 16066  
United States  
+1-724-776-8600  
[info.us@MSAsafety.com](mailto:info.us@MSAsafety.com)

**Design Center:**  
**General Monitors**  
26776 Simpatica Circle  
Lake Forest, CA 92630  
United States  
+1-949-581-4464  
[info.gm@MSAsafety.com](mailto:info.gm@MSAsafety.com)

Additional locations can be found on our web site:  
[www.MSAsafety.com](http://www.MSAsafety.com)