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
- Dual serial communications
- HART communication
- 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.

MSA
The Safety Company

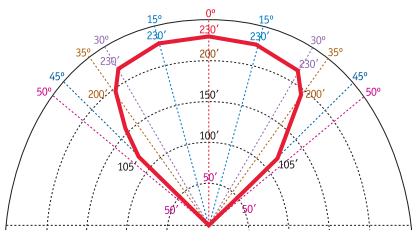
*Because every life has a **purpose...***

General Monitors by MSA

System Specifications	
SPECTRAL RANGE	2 – 5 microns (IR)
MAXIMUM RANGE	230 ft. (70 m)*
TYP. RESPONSE TIME	≤ 10 s
MIN. ARC WELDING IMMUNITY DISTANCE	5-15 ft. (1.5-4.6 m) depending on rod
MAX. 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, Type 6P Ex d IIC T5 Gb Ex tb IIIC, T100°C Db, IP66/67 HART Registered SIL 3 Suitable (FM)
WARRANTY	Two years
APPROVALS	CSA, FM, ULC, ATEX, IECEx, EN 54-10, MED, DNV-GL, VNIIPO, GOST, Inmetro, CE
Environmental Specifications	
OPERATING/STORAGE TEMPERATURE RANGE	-40° F to +176° F (-40° C to +80° C)
OPERATING HUMIDITY RANGE	10% to 95% RH, non-condensing
Mechanical Specifications	
HOUSING	316 stainless steel
HEIGHT	4.3" (109 mm)
DIAMETER	5.4" (137 mm) base 3.5" (89 mm) optical housing
WEIGHT	7.9 lbs (3.6 kg)
MOUNTING	Stainless steel mounting bracket
CABLE ENTRY	2 x ¾" NPT

Electrical Specifications	
INPUT POWER	20-36 VDC 24 VDC @ 150 mA (4.4 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
EMC	Complies with EN 61000-6-4 and EN 50130-4
SELECTABLE OPTIONS SENSITIVITY ALARM TIME DELAY WARN & ALARM RELAYS	 High, Medium or Low up to 14 seconds with dip switches and up to 30 seconds with Modbus 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. AMSaware
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 - 3,000 ft (930 m) Maximum 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

sales@norrscope.com