

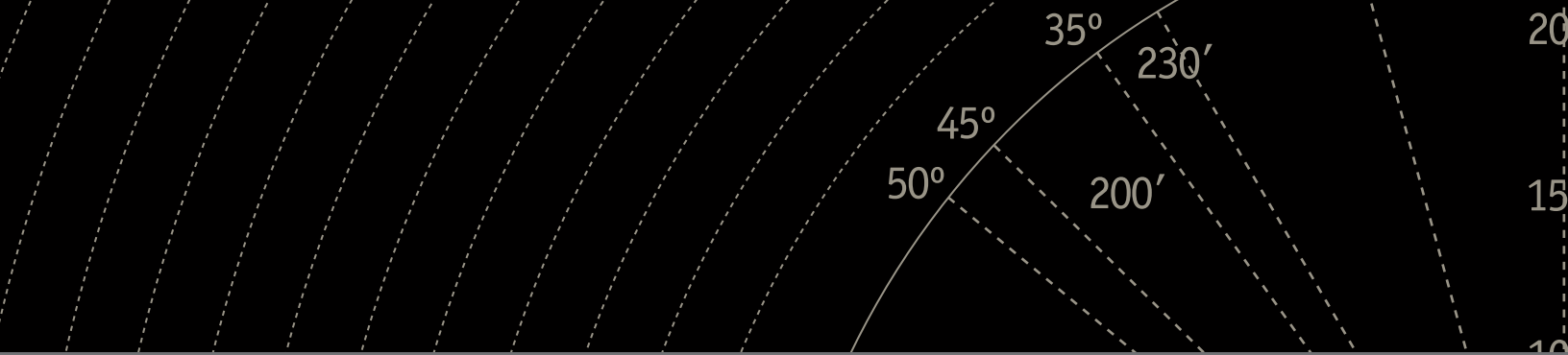


# FlameGard® 5 MSIR Flame Detector



Advanced Multi-Spectral Infrared Sensor Array  
with Breakthrough Neural Network Intelligence  
for Improved False Alarm Immunity





MSA's FlameGard 5 Multi-Spectral Infrared (MSIR) Flame Detector with neural network technology sets a new industry standard for performance, reliability and value. This is the industry's first MSIR/NNT flame detector designed to operate at a longer range with a wider field of view and at a higher level of accuracy for superior false alarm immunity.

Combining a precision multi-spectral IR sensing array with highly intelligent neural network processors, the FlameGard 5 MSIR Detector reliably discriminates between actual flames and nuisance false alarm sources (such as arc welding or hot objects).



## Standard features of the FlameGard 5 MSIR Flame Detector include:

- MSIR sensor array for a range of up to 230 ft.
- Neural network technology for superior false alarm immunity
- Continuous optical path monitoring (COPM) checks optical path integrity for high reliability
- Response time of <10 seconds for rapid flame detection and alarming
- Industry standard 4-20 mA output signal for communication with remote alarms, PLCs or DCS
- HART digital communication signal superimposed on the 4-20 mA analog signal
- Dual-redundant ModBus communications via RS-485 interface for remote operation
- Test lamp that checks all outputs
- Explosion-proof stainless steel housing for corrosive and marine environments
- Event logging records time, date and type of event
- Minimum immunity distance to arc welding: 5-15 ft. (1.5-4.6 m)



## How MSIR/NNT Flame Detection Works

The FlameGard 5 MSIR Detector is a highly discriminating MSIR/NNT detector, which makes use of multiple infrared sensors sampling different IR spectrum wavelengths. Each detector's analog sensor signals are sampled and converted into digital format for signal pre-processing to extract time and frequency data.

This time and frequency information is used by the FlameGard 5 MSIR Detector's proprietary neural network classification algorithm to identify whether input IR signals are emitted from a flame or non-flame source. The flame or non-flame decision is then reported as an output via LEDs, relays, HART and/or ModBus.

With its NNT flame discrimination algorithm, the FlameGard 5 MSIR Detector is highly immune to false alarms. Continuous optical path monitoring (COPM) self-diagnostic circuitry checks both the optical path (window cleanliness) and the detector's circuitry once every minute. Serial ports allow up to 128 units (247 using repeaters) to be linked to a host computer using the ModBus RTU protocol.

The FlameGard 5 MSIR Detector's breakthrough NNT signal processing model offers a distinct advantage. Its ability to adapt to customer application conditions is almost limitless, resulting in highly reliable flame protection with superior false-alarm immunity.

## Lower Your Total Installation Cost

The FlameGard 5 MSIR Flame Detector is a powerful next generation solution with distinct advantages over many existing flame detection devices in the marketplace. The FlameGard 5 MSIR Detector's greater range and wider field of view reduces the number of detectors necessary in many applications – thereby cutting total installation cost while achieving greater false alarm immunity.

## Approvals

To support global applications, the FlameGard 5 MSIR Detector is approved for CSA, FM, ATEX, IECEx, ULC and has CE marking. Additionally, it is rated as SIL 3 suitable, and is FM-certified to IEC 61508.

## Applications Versatility

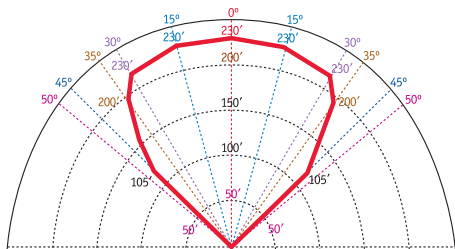
Until now, plant engineers facing chronic false alarm problems have had to choose among accepting the costs of false alarms, changing the process, or installing complex redundant flame detection systems at a high cost and with high maintenance requirements. The FlameGard 5 MSIR Detector with its highly intelligent MSIR/NNT sensor addresses the shortcomings of today's typical flame detectors and is ideal for a wide range of applications and industries, including:

- Automotive
- Aerospace
- Chemical Plants
- Electric Power
- Food/ Beverage
- Offshore Platforms
- Oil/ Gas Distribution
- Oil/ Gas Refineries
- Pharmaceuticals
- Textile Manufacturing
- Warehouses
- Wood and Paper Plants



### 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 FlameGard 5 MSIR Detector 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)
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
RFI/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
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 Flamegard 5 MSIR 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 Part Numbers	5MSIR-1013110 Dual ModBus, no relays, 0 - 20 mA, high sensitivity, 10-second delay 71370-1 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.



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