Rosemount™ 975MR Multi-Spectrum Infrared Flame Detector

In the Rosemount 975MR multi-spectrum infrared flame detector, three separate infrared sensors analyze multi-spectral signals. The Rosemount 975MR detects fuel and gas fires at long distance. For example, this product will detect a gasoline pan fire at 215 ft. (65 m) in less than five seconds. The 975MR also provides the highest immunity to false alarms at an industry-leading detection range.

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Features and benefits

- Multi-spectrum design for long distance detection

- High false alarm immunity

- Sensitivity selection to ensure no zone crossover detection

- Automatic and manual built-in test (BIT) to assure continued reliable operation

- Heated window for operation in harsh weather conditions (snow, ice, or condensation)

- Multiple output options for maximum flexibility and compatibility
  - Three relays for alarm, fault, and auxiliary
  - 0-20 mA (stepped)
  - HART® protocol for maintenance and asset management
  - RS-485 Modbus® compatible

- High reliability - MTBF - minimum 150,000 hours

- Approved to Safety Integrity Level 2 (SIL2 - TÜV)

- Five year warranty

- User programmable via HART or RS-485

Applications

- Oil and gas: offshore and onshore process facilities

- Chemical plants

- Petrochemical plants

- Aircraft hangars

- Power generation facilities

- Pharmaceutical industry

- Warehouses

- Automotive

Contents

Specifications

Table 1: General Specifications

Spectral response	Multi infrared bands
Detection ranges (at highest sensitivity setting for 1 ft.2 [0.1 m^2] pan fire)	See Table 2.
Response time	Typically 5 seconds
Adjustable time delay	Up to 30 seconds
Sensitivity ranges	4 sensitivity ranges for 1 ft.2 (0.1 m^2) n-heptane pan fire from 50 ft. (15 m) to 215 ft. (65 m)
Field of view	Horizontal: 100°, vertical: 95°
Built-in-test (BIT)	Automatic and manual
Temperature range	Operating -67 to +167 °F (-55 to +75 °C) Option: -67 to +185 °F (-55 to +85 °C) Storage: -67 to +185 °F (-55 to +85 °C)
Humidity	Up to 95% non-condensing (withstands up to 100% relative humidity for short periods)
Heated optics	To eliminate condensation and icing on window

Table 2: Detection Ranges

Fuel	ft./m
n-Heptane	215/65
Gasoline	215/65
Diesel fuel	150/45
JP5	150/45
Kerosene	150/45
Ethanol	135/40
Methanol	115/35
IPA (isopropyl alcohol)	135/40
Methane[1]	150/45
LPG[1]	150/45
Polypropylene pellets	115/35
Ammonia[2]	60/18
Silane[2]	2/7
Office paper	82/25

(1)   *30 in. (0.75 m) high, 9.8 in. (0.25 m) wide plume fire*
(2)   *25 in. (0.5 m) high, 8 in. (0.2 m) wide plume fire*

Table 3: Electrical Specifications

Operating voltage	24 Vdc nominal (18 - 32 Vdc)

Table 3: Electrical Specifications *(continued)*

Power consumption	Standby: Maximum 90 mA (110 mA with heated window)
	Alarm: Maximum 130 mA (160 mA with heated window)
Cable entries	2 x ¾-in. - 14 NPT conduits or 2 x M25 x 1.5 mm ISO
Wiring	12-22 AWG: 0.3 mm^2 to 2.5 mm^2
Electrical input protection	According to MIL-STD-1275B
Electromagnetic compatibility	EMI/RFI protected to EN 61326-3 and EN 61000-6-3
Electrical interface	The detector includes 12 terminals with 5 wiring options (factory set).

Table 4: Outputs

Relays	Alarm, fault, and auxiliary
	SPST volt-free contacts rated 2 A at 30 Vdc
0-20 mA (stepped)	Sink (source option) configuration:
	Fault: 0 +1 mA
	BIT fault: 2 mA ±10%
	Normal: 4 mA ±10%
	Warning: 16 mA ±5%
	Alarm: 20 mA ±5%
	Resistance loop: 100 to 600 Ω
HART® protocol	Optional HART® communications on the 0-20 mA analog current (FSK): used for maintenance, configuration changes, and asset management, available in mA source output wiring options.
RS-485	RS-485 Modbus® compatible communication link that can be used in computer controlled installations

Table 5: Mechanical Specifications

Materials	Stainless steel 316L with electro polish finish
Enclosure options	Heavy duty copper-free aluminum (less than 1%), red epoxy enamel finish (not available in FM version)
Mounting	Stainless steel 316L with electro polish finish
Dimensions	Detector: 4 x 4.6 x 6.18 in. (101.5 x 117 x 157 mm)
Weight	Detector (stainless steel 316L): 6.1 lb. (2.8 kg)
	Tilt mount: 2.2 lb. (1.0 kg)
Environmental standards	Meets MIL-STD-810C for humidity, salt and fog, vibration, mechanical shock, high temperature, and low temperature.
Water and dust	IP66 and IP67 per EN 60529, NEMA 250 6P

Table 6: Approvals

Hazardous area: ATEX and IECEx	II 2 G D Ex db eb op is IIC T4 Gb Ex tb op is IIIC T96 °C Db (Ta -55 °C to +85 °C) or Ex 2 G D Ex db eb op is IIC T4 Gb Ex tb op is IIIC T96 °C Db (Ta -55 °C to +75 °C)
Hazardous area: FM/FMC/CSA	Class I Div. 1, Groups B, C, and D Class II/III Div.1, Groups E, F, and G
Performance	EN 54-10 (VdS) FM 3260
Reliability	IEC 61508 - SIL 2 (TÜV)
Marine	MED "wheelmark" approval (DNV) "Type" approval (DNV)

Table 7: Accessories

Flame simulator kit	FS-IR-975
Tilt mount	00975-9000-0001
Duct mount	00975-9000-0002
U-bolt/pole mount	00975-9000-0007 (2 in. [50.8 mm] pole) 00975-9000-0008 (3 in. [76.2 mm] pole)
USB RS-485 harness kit	00975-9000-0011
Weather protector	Plastic: 00975-9000-0003 Stainless steel: 00975-9000-0004
Air shield	00975-9000-0005
Cone viewer kit	00975-9000-0006

For more information: **www.emerson.com**

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