

# Rosemount™ 975MR Multi-Spectrum Infrared Flame Detector



The Rosemount 975MR Multi-Spectrum Infrared Flame Detector is based on accurately analyzing the multi-spectral signals by utilizing four separate IR sensors. The Rosemount 975MR detects fuel and gas fires at long distances. For example, this product will detect a 1 ft<sup>2</sup> (0.1 m<sup>2</sup>) gasoline pan fire at 300 ft. (90 m). The Rosemount 975MR also provides the highest immunity to false alarms and enhanced overall coverage range.

# Features and benefits

- Multi spectrum design for long distance detection
- 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)
- Relays (3) 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
- Designed to meet Safety Integrity Level SIL3 (TÜV)
- Five year warranty
- User programmable via HART® or RS-485

---

## Contents

|                            |   |
|----------------------------|---|
| Features and benefits..... | 2 |
| Applications examples..... | 3 |
| Ordering information.....  | 4 |
| Specifications.....        | 6 |
| Dimensional drawings.....  | 9 |

## Applications examples

- Oil and gas: offshore and onshore process facilities and pipelines
- Chemical plants
- Petrochemical plants
- Power generation facilities
- Pharmaceutical industry
- Explosives and ammunition manufacturing

## Ordering information

You can order the Rosemount 975 as separate parts: detector (PN 975XXXXXXXXX), and accessories.



- Longest distance detection
- Ultra fast response to fire
- Widest operation temperature range
- Highest immunity to false alarms

[CONFIGURE >](#)[VIEW PRODUCT >](#)

## Model

| Code | Description                  |
|------|------------------------------|
| 975  | Rosemount 975 Flame Detector |

## Measurement type

| Code | Description             |
|------|-------------------------|
| MR   | Multi-Spectrum Infrared |

## Output

| Code | Description      |
|------|------------------|
| 4U   | Universal wiring |

## Housing style

| Code | Description                                   |
|------|-----------------------------------------------|
| 6A   | Aluminum - 3/4-in. NPT conduit entries        |
| 8A   | Aluminum - M25 conduit entries                |
| 6S   | Stainless steel - 3/4-in. NPT conduit entries |
| 8S   | Stainless steel - M25 conduit entries         |

## Temperature rating

| Code | Description                    |
|------|--------------------------------|
| 3    | -60 to +85 °C (-76 to +185 °F) |

## Product certifications

| Code | Description                                                     |
|------|-----------------------------------------------------------------|
| A1   | ATEX/IECEX flameproof                                           |
| A2   | FM and CSA flameproof                                           |
| E2   | INMETRO flameproof                                              |
| EM   | Technical Regulations Customs Union (EAC) flameproof            |
| KZ   | Technical Regulations Customs Union (EAC) Kazakhstan flameproof |

## Tilt mount

| Code | Description   |
|------|---------------|
| Y    | Tilt mount    |
| N    | No tilt mount |

## Rain cover

| Code | Description        |
|------|--------------------|
| 0    | No rain cover      |
| 7    | Plastic rain cover |
| 8    | SST rain cover     |

## Specifications

**Table 1: General Specifications**

|                                                                                                        |                                                                                      |
|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Spectral response                                                                                      | Four infrared bands                                                                  |
| Detection ranges (at highest sensitivity setting for 1 ft <sup>2</sup> [0.1 m <sup>2</sup> ] pan fire) | See <a href="#">Table 3</a> .                                                        |
| Sensitivity ranges                                                                                     | 6 sensitivity ranges for 1 ft <sup>2</sup> (0.1 m <sup>2</sup> ) n-heptane pan fire  |
| Field of view                                                                                          | Horizontal: 100°, vertical: 95°                                                      |
| Temperature range                                                                                      | Operating: -76 to +185 °F (-60 to +85 °C)<br>Storage: -76 to +185 °F (-60 to +85 °C) |
| Humidity                                                                                               | Up to 95% non-condensing (withstands up to 100% relative humidity for short periods) |

**Table 2: Detection Response Time**

|                                      |                                                                                                                   |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Standard response time               | Typically < 5 seconds                                                                                             |
| High speed response time (explosion) | 50 msec for 1 ft. (0.30 m) diameter sphere LPG-air mixture explosion at 32.8 ft. (10 m) via analog voltage output |

**Table 3: Detection Range**

| Fuel                                                           | ft/m   |
|----------------------------------------------------------------|--------|
| Gasoline (Petrol) <sup>(1)</sup>                               | 300/90 |
| N-Heptane <sup>(1)</sup>                                       | 300/90 |
| Diesel fuel <sup>(1)</sup>                                     | 210/63 |
| Methane                                                        | 210/63 |
| Liquefied petroleum gas (LPG)                                  | 210/63 |
| Kerosene <sup>(1)</sup>                                        | 210/63 |
| Jet fuel JP5 <sup>(1)</sup>                                    | 210/63 |
| Jet fuel A1 <sup>(1)</sup>                                     | 210/63 |
| Ethanol 95% <sup>(1)</sup>                                     | 57/17  |
| Isopropyl alcohol (IPA) <sup>(1)</sup>                         | 185/55 |
| Methanol <sup>(1)</sup>                                        | 185/55 |
| Ethylene glycol <sup>(1)</sup>                                 | 164/50 |
| Solvents <sup>(1)</sup>                                        | 246/75 |
| Flammable adhesive (flash point 140 °F < 60 °C) <sup>(1)</sup> | 210/63 |
| Butyl acrylate <sup>(1)</sup>                                  | 246/75 |
| Vinyl acetate <sup>(1)</sup>                                   | 246/75 |
| Oil paint <sup>(1)</sup>                                       | 210/63 |
| Gun powder <sup>(2)</sup>                                      | 197/60 |
| Fireworks <sup>(3)</sup>                                       | 33/10  |

**Table 3: Detection Range (continued)**

|                                      |        |
|--------------------------------------|--------|
| Magnesium alloy <sup>(4)</sup>       | 33/10  |
| Polypropylene pellets <sup>(1)</sup> | 163/49 |
| Office paper <sup>(1)</sup>          | 115/34 |
| Wood <sup>(1)</sup>                  | 111/34 |
| Mineral oil (20w50) <sup>(1)</sup>   | 210/63 |
| Cooking oil <sup>(1)</sup>           | 210/63 |
| Lithium ion battery <sup>(5)</sup>   | 279/85 |

(1) 1 ft x 1 ft (0.3 m x 0.3 m) pan

(2) 1.5-in. sq.

(3) 10 pcs per test

(4) Only for UV detector

(5) One cell of battery per test

**Table 4: Electrical Specifications**

|                               |                                                                                            |
|-------------------------------|--------------------------------------------------------------------------------------------|
| Operating voltage             | 24 Vdc nominal (18-32 Vdc)                                                                 |
| Power consumption             | Standby: Max. 3 W (8 W with heated window)<br>Alarm: Max. 4.2 W (9.6 W with heated window) |
| Cable entries                 | 2 x ¾-in.-14 NPT conduits or 2 x M25 x 1.5 mm ISO                                          |
| Electrical input protection   | According to EN50130                                                                       |
| Electromagnetic compatibility | EMI/RFI protected to EN61000-6-3 and EN50130                                               |
| Electrical interface          | The detector includes 17 terminals with one wiring option                                  |

**Table 5: Outputs**

|                       |                                                                                                                                                                                        |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relays                | Alarm, fault, and auxiliary<br>SPST volt-free contacts rated 2 A at 30 Vdc                                                                                                             |
| Analog voltage output | Analog port malfunction: 0 V (< 0.5 V)<br>Normal: 2 V ± 0.3 V<br>Alarm/Explosion: 5 V ± 0.3 V                                                                                          |
| 0-20 mA (stepped)     | Sink (source option) configuration:<br>Fault: 0 ± 1 mA<br>BIT fault: 2 mA ± 10 %<br>Normal: 4 mA ± 10 %<br>Warning: 16 mA ± 5 %<br>Alarm: 20 mA ± 5 %<br>Resistance loop: 100 to 600 Ω |
| HART® protocol        | 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 6: Mechanical Specifications**

|                         |                                                                                                                      |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|
| Enclosure options       | Stainless steel 316 with electro polish finish<br>Heavy duty copper free aluminum (less than 1%), polyurethane paint |
| Mounting                | Tilt mount material-stainless steel 316 with electro polish finish                                                   |
| Dimensions              | Detector 4 x 4.6 x 6.18-in. (100.6 x 117 x 155 mm)                                                                   |
| Weight                  | Detector stainless steel: 6.3 lb. (2.9 kg)<br>Detector aluminum: 2.8 lb. (1.3 kg)<br>Tilt mount: 2.5 lb. (1.1 kg)    |
| Environmental standards | DNV 2-4                                                                                                              |
| Water and dust          | IP66 and IP68 per EN60529, NEMA 250 6P                                                                               |

**Table 7: Approvals**

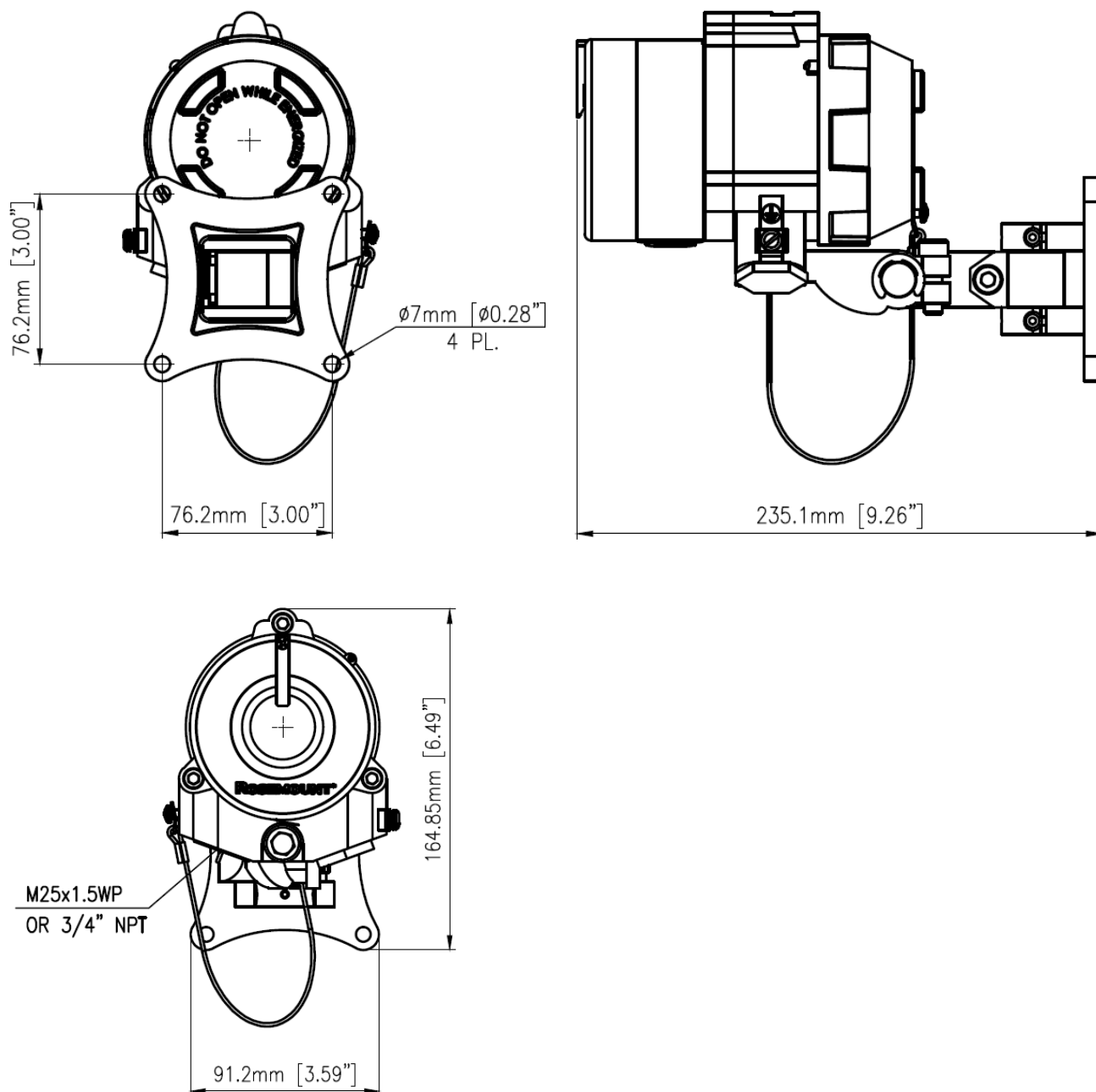
|                |                            |                                                                                                                                                                                  |
|----------------|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hazardous area | ATEX and IECEx             | Ex II 2 G D<br>Ex db eb IIC T4 Gb<br>Ex tb IIIC T110 °C Db<br>(-50 °C ≤ T <sub>a</sub> ≤ +85 °C)                                                                                 |
|                | FM/FMC/CSA                 | Class I Division 1, Groups B, C, and D, T4<br>Class II/III Division 1, Groups E, F, and G, T4<br>Class I Division 2, Groups B, C, and D, T4<br>T <sub>a</sub> = -50 °C to +85 °C |
|                | TR CU (EAC)                | Ex db eb IIC T4 Gb X<br>Ex tb IIIC T110 °C Db X<br>(-55 °C ≤ T <sub>a</sub> ≤ +85 °C)                                                                                            |
| Marine         | MED "Wheelmark" (DNV)      |                                                                                                                                                                                  |
| Performance    | EN54-10 (VdS)   FM3260     |                                                                                                                                                                                  |
| Reliability    | IEC61508 - SIL3 compatible |                                                                                                                                                                                  |

**Table 8: Accessories**

| Accessory                  | Part number                            |
|----------------------------|----------------------------------------|
| Flame simulator (Ex proof) | FS-IR-975                              |
| Tilt mount                 | 00975-9000-0022                        |
| Duct mount (Ex proof)      | 00975-9000-0018                        |
| 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                        |
| Air shield                 | 00975-9000-0019                        |
| Protective cover           | ABS plastic: 00975-9000-0020           |
|                            | Stainless steel: 00975-9000-0021       |

## Dimensional drawings

Figure 1: IR3 Flame Detector + Tilt







For more information: [www.emerson.com](http://www.emerson.com)

©2021 Emerson. All rights reserved.

Emerson Terms and Conditions of Sale are available upon request. The Emerson logo is a trademark and service mark of Emerson Electric Co. Rosemount is a mark of one of the Emerson family of companies. All other marks are the property of their respective owners.

**ROSEMOUNT™**

