

# Rosemount™ 975UR Ultraviolet Infrared Flame Detector



Rosemount 975UR UV/IR Flame Detector senses radiant energy in the short wave section of both the ultraviolet and infrared portions of the electromagnetic spectrum and can detect hydrocarbon-based fuel and gas fires. The signals from both sensors are analyzed for frequency, intensity and duration. Simultaneous detection of radiant energy in both the UV and IR sensors triggers an alarm signal. The UV sensor incorporates a special logic circuit that helps prevent false alarms caused by solar radiation.

## Features and benefits

- UV/IR Dual-Sensor
- Automatic and manual non-radioactive UV built-in test (BIT) to assure continued reliable operation
- Heated window for operation in harsh weather conditions (snow, ice, 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® 7 or RS-485 Modbus

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## Applications examples

- Oil and gas: offshore and onshore process facilities and pipelines
- Chemical plants
- Petrochemical plants
- Storage tank farms
- 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

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## Model

Code	Description
975	Rosemount 975 Flame Detector

## Measurement type

Code	Description
UR	Ultraviolet Infrared

## Output

Code	Description
4U	Universal wiring

## Housing style

Code	Description
6A	Aluminum - ¾-in. NPT conduit entries
8A	Aluminum - M25 conduit entries
6S	Stainless steel - ¾-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	UV: 0.185–0.260 $\mu\text{m}$ ; IR: 4.4–4.6 $\mu\text{m}$
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	3 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) Storage: -76 to +185 °F (-60 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 Response Time**

Standard response time	Typically 5 sec. at 93 ft. (28 m)
Ultra fast response time	20 msec for 1 ft <sup>2</sup> (0.1 m <sup>2</sup> ) n-heptane pan fire at 10 ft. (3 m)
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>	93/28
N-Heptane <sup>(1)</sup>	93/28
Diesel fuel <sup>(1)</sup>	70/21
Methane	60/18
Liquefied petroleum gas (LPG)	60/18
Kerosene <sup>(1)</sup>	70/21
Jet fuel JP5 <sup>(1)</sup>	70/21
Jet fuel A1 <sup>(1)</sup>	70/21
Ethanol 95% <sup>(1)</sup>	57/17
Isopropyl alcohol (IPA) <sup>(1)</sup>	70/21
Methanol <sup>(1)</sup>	57/17
Ethylene glycol <sup>(1)</sup>	23/7
Solvents <sup>(1)</sup>	70/21
Flammable adhesive (flash point 140 °F < 60 °C) <sup>(1)</sup>	70/21
Butyl acrylate <sup>(1)</sup>	70/21
Vinyl acetate <sup>(1)</sup>	70/21
Oil paint <sup>(1)</sup>	70/21

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

Gun powder <sup>(2)</sup>	93/28
Fireworks <sup>(3)</sup>	10/3
Magnesium alloy <sup>(4)</sup>	33/10
Polypropylene pellets <sup>(1)</sup>	60/18
Office paper <sup>(1)</sup>	33/10
Wood <sup>(1)</sup>	33/10
Mineral oil (20w50) <sup>(1)</sup>	70/21
Cooking oil <sup>(1)</sup>	70/21
Lithium ion battery <sup>(5)</sup>	75/23

(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) 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 SPST volt-free contacts rated 2 A at 30 Vdc
Analog voltage output	Analog port malfunction: 0 V (< 0.5 V) Nomal: 2 V ± 0.3 V Alarm/Explosion: 5 V ± 0.3 V
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 <sup>®</sup> 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 <sup>®</sup> compatible communication link that can be used in computer controlled installations

**Table 6: Mechanical Specifications**

Enclosure options	Stainless steel 316 with electro polish finish 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) Detector aluminum: 2.8 lb. (1.3 kg) 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**

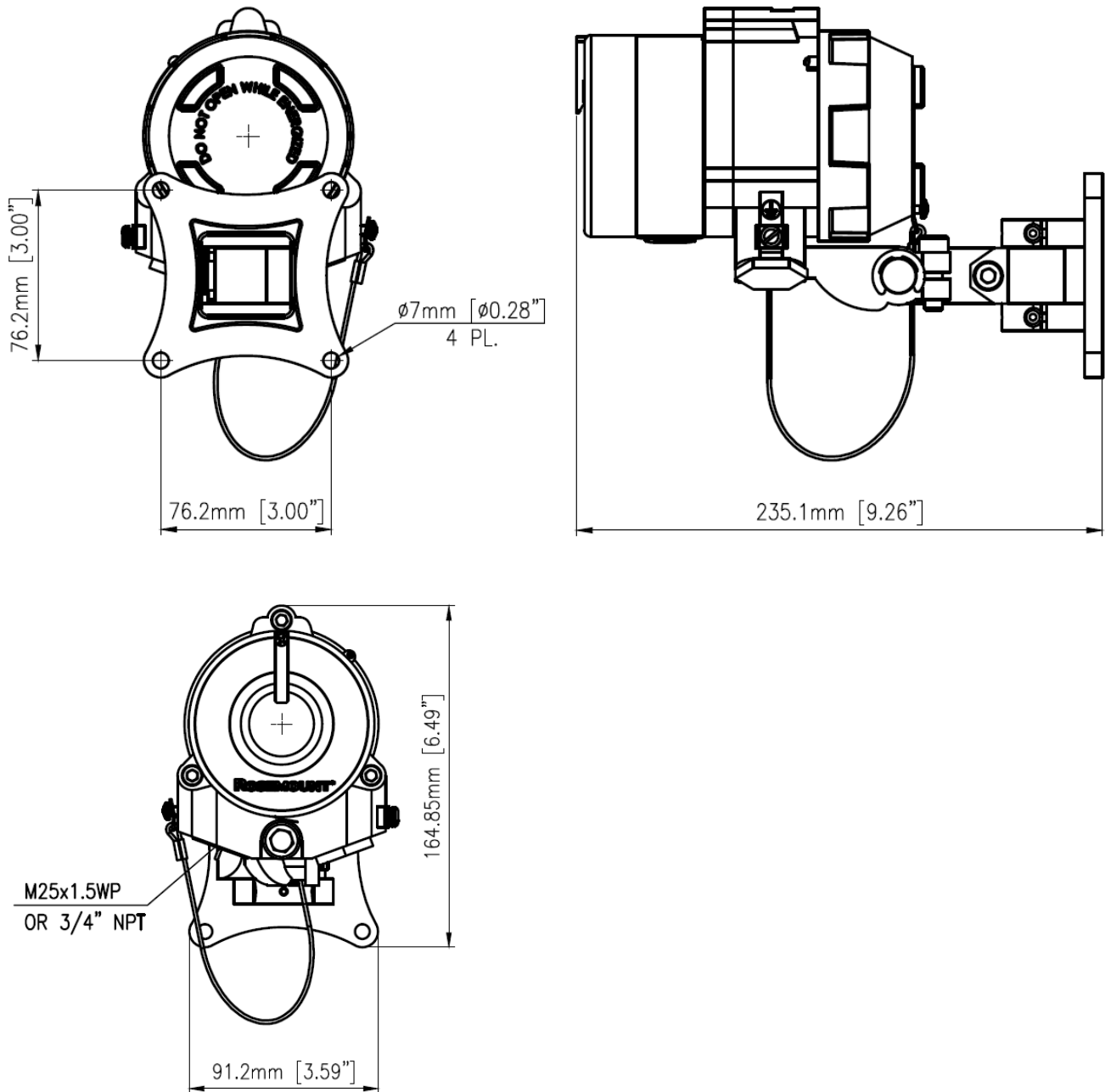
Hazardous area	ATEX and IECEx	Ex II 2 G D Ex db eb IIC T4 Gb Ex tb IIIC T110 °C Db (-50 °C ≤ T <sub>a</sub> ≤ +85 °C)
	FM/FMC/CSA	Class I Division 1, Groups B, C, and D, T4 Class II/III Division 1, Groups E, F, and G, T4 Class I Division 2, Groups B, C, and D, T4 T <sub>a</sub> = -50 °C to +85 °C
	TR CU (EAC)	Ex db eb IIC T4 Gb X Ex tb IIIC T110 °C Db X (-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-UVIR-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







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