Rosemount™ 975UR

Ultraviolet Infrared Flame Detector

The Rosemount™ 975UR provides a combination of UV and IR sensors, where the IR sensor operates at a wavelength of 4.5 μm, and can detect hydrocarbon-based fuel and gas fires.

The UV sensor incorporates a special logic circuit that helps prevent false alarms caused by solar radiation.

The UV/IR flame detector senses radiant energy in the short wave section of both the ultraviolet and infrared portions of the electromagnetic spectrum. 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.

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Features and benefits

- UV/IR dual-sensor
- Automatic and manual built-in-test (BIT) - to assure continued reliable operation
- Heated window - for operation in harsh weather conditions (snow, ice, condensation)
- Multiple output options for maximum flexibility and compatibility
  - 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
- 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
- Petrochemicals plants
- Storage tank farms
- Aircraft hangars
- Power generation facilities
- Pharmaceutical industry
- Printing industry
- Warehouses
- Waste disposal facilities
- Aerospace industry
- Paint, polymer, and glue processes

Specifications

Table 1 - Rosemount 975UR Ultraviolet Infrared Flame Detector

General specifications	
Spectral response	UV: 0.185–0.260 µm; IR: 4.4–4.6 µm
Detection range (at highest sensitivity setting for 0.1 m² (1 ft²) pan fire)	**Fuel** / **m / ft** / **Fuel** / **m / ft** / **Fuel** / **m / ft** n-Heptane 28 / 93 Kerosene 21 / 70 Alcohol 95 % 17 / 57 Gasoline 28 / 93 Methanol 17 / 57 Polypropylene pellets 18 / 60 Diesel fuel 21 / 70 IPA (Isopropyl alcohol) 21 / 70 Office paper 10 / 33 JP5 21 / 70 Methane* 18 / 60 LPG* 18 / 60 **0.75 m (30 in.) high, 0.25 m (10 in.) width plume fire*
Response time	Typically 5 s.
Adjustable time delay	Up to 30 s
Sensitivity ranges	0.1 m² (1 ft²) n-heptane pan fire from 28 m (92 ft)
Field of view	Horizontal 100°, vertical 95°
Built-in-test (BIT)	Automatic (and manual)
Temperature range	Operating: -55 °C to +75 °C (-67 °F to +167 °F) Option: -55 °C to +85 °C (-67 °F to +185 °F) Storage: -55 °C to +85 °C (-67 °F to +185 °F)
Humidity	Up to 95 % non-condensing (withstands up to 100 % relative humidity for short periods)
Heated optics	To eliminate condensation and icing on the window
Electrical specifications	
Operating voltage	24 Vdc nominal (18–32 Vdc)
Power consumption	Standby: Max. 90 mA (110 mA with heated window) Alarm: Max. 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 mm²–2.5 mm²)
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 twelve (12) terminals with five (5) wiring options (factory set)
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 IR: 8 mA ±5 % Alarm: 20 mA ±5 % BIT fault: 2 mA ±10 % UV: 12 mA ±5 % Resistance loop: 100–600 Ω Normal: 4 mA ±10 % Warning: 16 mA ±5 %
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
Mechanical specifications	
Materials Enclosure options	- Stainless steel 316L with electro polish finish - 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 101.6 x 117 x 157 mm (4 x 4.6 x 6.18 in.)
Weight	Detector (stainless steel 316L) 2.8 kg (6.1 lb) Detector (aluminum) 1.3 kg (2.8 lb) Tilt mount 2.0 kg (2.2 lb)
Environmental standards	Meets MIL-STD-810C for humidity, salt and fog, vibration, mechanical shock, high temp, low temp
Water and dust	IP66 and IP67 per EN 60529, NEMA 250 6P

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 db eb op is IIC T4 Gb Ex tb op is IIIC T106 °C Db (Ta -55 °C to +75 °C)
	FM/FMC/CSA	Class I Div. 1, Groups B, C, & D Class II/III Div.1, Groups E, F, & G	
Performance	EN 54-10 (VdS) FM 3260		
Reliability	IEC 61508 - SIL2 (TÜV)		
Marine	MED "Wheelmark" approval (DNV) "Type" approval (DNV)		

Accessories	
Flame simulator kit	00975-9000-0010
Tilt mount	00975-9000-0001
Duct mount	00975-9000-0002
U-bolt/pole mount	00975-9000-0007 (2 in. pole) 00975-9000-0008 (3 in. 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

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