

# Rosemount™ 975UF

## Ultra Fast Ultraviolet Infrared Flame Detector



The Rosemount 975UF ultra fast ultraviolet infrared flame detector is designed to meet two major requirements:

- High-speed response (20 msec).
- High reliability (immunity to false alarms).

## Features and benefits

The Rosemount™ 975UF ultra fast ultraviolet infrared flame detector can detect hydrocarbon-based fuel and gas fires, hydroxyl and hydrogen fires, as well as metal and inorganic fires. 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 detector analyzes the signals from both sensors 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.

- UV/IR dual sensor.
- High speed response: 20 milliseconds for flash fire.
- Solar blind.
- Automatic 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.
- Storage tank farms.
- Aircraft hangars.
- Power generation facilities.
- Pharmaceutical industry.
- Printing industry.
- Warehouses.
- Automotive.

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### Contents

Features and benefits.....	2
Applications.....	2
Specifications.....	3

- Explosives and ammunition.
- Waste disposal facilities.
- Aerospace industry.
- Hydrogen fuel cell industry.
- Hydrogen vehicle parking and refueling.
- Battery charging areas.
- Refinery hydrogenation.
- Space industry hydroxyl propellant.
- Static fuel cell systems.

## Specifications

**Table 1: General Specifications**

Spectral response	UV: 0.185–0.260 $\mu\text{m}$ ; IR: 2.5–3.0 $\mu\text{m}$
Detection ranges (at highest sensitivity setting for 1 ft. <sup>2</sup> [0.1 m <sup>2</sup> ] pan fire)	See <a href="#">Table 2</a> .
Response time	Typically 3 seconds. High speed 20 milliseconds to flash fire.
Adjustable time delay	Up to 30 seconds
Field of view	Horizontal: 100°, vertical: 95°
Built-in-test (BIT)	Automatic
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	66/20
Gasoline	66/20
Diesel fuel	49/15
JP5	49/15
Kerosene	49/15
Ethanol	25/7.5
Methanol	26/8
IPA (isopropyl alcohol)	43/13
Hydrogen <sup>(1)</sup>	37/11
Methane <sup>(2)</sup>	26/8

**Table 2: Detection Ranges (continued)**

Fuel	ft./m
LPG <sup>(3)</sup>	43/13
Polypropylene pellets	43/13
Ammonia <sup>(4)</sup>	20/6
Silane <sup>(4)</sup>	6/1.8
Office paper	16/5

(1) 30 in. (0.75 m) high, 9.8 in. (0.25 m) wide plume fire

(2) 30 in. (0.75 m) high, 9.8 in. (0.25 m) wide plume fire

(3) 30 in. (0.75 m) high, 9.8 in. (0.25 m) wide plume fire

(4) 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)
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 <sup>2</sup> to 2.5 mm <sup>2</sup>
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
0-20 mA (stepped)	Sink (source option) configuration: Fault: 0 +1 mA BIT fault: 2 mA ±10% Normal: 4 mA ±10% IR: 8 mA ± 5 % UV: 12 mA ± 5 % 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
Mounting	Stainless steel 316L with electro polish finish

**Table 5: Mechanical Specifications (continued)**

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, & D Class II/III Div.1, Groups E, F, & G
Performance	EN 54-10 (VdS) FM 3260
Reliability	IEC 61508 - SIL 2 (TÜV)

**Table 7: Accessories**

Flame simulator kit	FS-UVIR-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





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