Product Data Sheet
00813-0200-4976, Rev AE
March 2024

Rosemount™ 975HR

Multi-Spectrum Infrared Hydrogen Flame Detector

The Rosemount 975HR Multi-Spectrum Infrared Hydrogen Flame Detector is specifically designed for the detection of hydrocarbon and hydrogen flames. It detects hydrocarbon-based fuel and gas fires at long distances with high immunity to false alarms. The Rosemount 975HR is the most durable and weather resistant hydrogen flame detector on the market. Its features include a heated window to eliminate condensation and icing, the HART® communication protocol, lower power requirements, and a compact lighter design.

Features and benefits

Multi-Spectrum QuadSense flame detector - integrating four infrared (IR) sensors to further improve differentiation of flame sources from non-flame background radiation.

- Superior detection range of hydrogen and hydrocarbon-based fuel and gas fires at up to 300 ft (90 m)
- Extended detection range more than doubles detection coverage
- Ultra fast detection, high speed response under 50 msec
- Proven false alarm immunity
- Unparalleled reliability - 150,000 hours MTBF
- Best in class temperature range: -76 °F (-60 °C) to +185 °F (+85 °C)
- Enhanced durability backed up by five-year warranty
- Six sensitivity levels, adapting to any application
- Smart field of view integrity test, allowing flawless operation
- Innovative infrared built-in test (BIT) - continuously validating the optical integrity and the electronic circuitry
- Multiple output options for maximum compatibility with standard infrastructures
- Plug and play - factory calibrated for immediate use in any fire detection system
- Universal wiring option for fast ordering process
- Two mode heated optics for impeccable performance in challenging environmental conditions
- Worldwide and regionally certified for hazardous areas
- Performance and reliability approved by recognizable certification bodies
- SIL3 compatible
- Internal log event recorder to analyze past events

Contents

Applications

- Oil and gas onshore and offshore installations and pipelines
- Hydrogenation (petroleum refining, food processing, and chemical)
- Chemical and petrochemical plants
- Storage tank farms
- Fuel and gas processing and storage facilities
- Power generation
- Explosives and munitions
- Fertilizer plants
- Automotive industry
- Vehicle battery charging stations
- Hydroxyl production and storage
- Aerospace industry
- Waste management facilities
- Hydrogen fuel cell industry
- Pharmaceutical industry
- Printing
- Hazardous materials storage areas
- Food processing
- Mining

Ordering information

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

CONFIGURE > VIEW PRODUCT >

Model

Code	Description
975	Rosemount 975 Flame Detector

Measurement type

Code	Description
HR	Multi-Spectrum Infrared Hydrogen

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	-76 °F (-60 °C) to 185 °F (85 °C)

Product certifications

Code	Description
A1	ATEX/IECEx/UKCA Flameproof
A2	USA and Canada Explosion-Proof(1)
E2	INMETRO Flameproof
EM	Technical Regulations Customs Union (EAC) Flameproof
KZ	Technical Regulations Customs Union (EAC) Kazakhstan Flameproof

(1) *Aluminum enclosure: FM, FMC*

Stainless steel enclosure: FM, FMC, CSA US/C

Tilt mount

Code	Description
Y	Tilt mount
N	No tilt mount

Protective cover

Code	Description
7	ABS plastic
8	Stainless steel 316

Accessories

Part number	Description
FS-HR-975	Flame simulator (ex proof)
877090	Tilt mount
877670	Flame detector duct mount assembly
789260-2	Flame detector pole mount assembly, 2 in.
789260-1	Flame detector pole mount assembly, 3 in.
789260-3	Flame detector pole mount assembly, 4 in.
794079	USB RS-485 harness kit
877650	Flame detector air shield assembly
877263	Protective cover (Plastic)
877163	Protective cover (Stainless steel)
877563	Field of view limiter

Specifications

Table 1: Detection ranges

At highest sensitivity setting for 1 ft.^{2} (0.1 m^2) pan fire.

Fuel	Range (ft./m)
Gasoline	300/90
n-Heptane	300/90
Diesel fuel	210/63
JP5	210/63
Kerosene	210/63
Ethanol 95%	183/55
Isopropyl alcohol (IPA)	183/55
Methanol	183/55
Methane(1)	210/63
Liquefied petroleum gas (LPG)(1)	210/63
Polypropylene pellets	163/49
Office paper	114/34
Hydrogen(1)	166/50
Magnesium alloy	N/A
Gun powder (1.5 in.^{2} [10 cm^2])	200/60
Fireworks (10 pieces per test)	33/10
Cooking oil	210/63
Mineral oil (20w50)	210/63
Wood	114/34
Ethylene glycol	166/50
Butyl acrylate	250/75
Vinyl acetate	250/75
Flammable adhesive (flash point < 140 °F [60 °C])	210/63
Solvents	250/75
Oil paint	210/63
Jet A1	210/63
Battery(2)	283/85
Ammonia fire(3)	117/35

(1) *30 in. (0.75 m) high, 10 in. (0.25 m) wide plume fire*
(2) *One lithium ion battery. Height: 2.6 in. (65 mm). Diameter: 0.72 in. (18.4 mm)*
(3) *Available for 975HR and 975UR only.*

Table 2: General specifications

Spectral response	Four infrared (IR) bands between 2 µm and 5 µm

Table 2: General specifications *(continued)*

Detection response time	■ Standard response: Typically < 2 sec at 131 ft (40 m) and 10 sec at 300 ft (90 m) ■ Ultra fast response: Typically < 1 sec at 100 ft (30 m) ■ High speed response (explosion): 50 msec for 1 ft (0.3 m) diameter sphere liquefied petroleum gas (LPG)/air mixture explosion at 66 ft (20 m) via analog voltage output
Sensitivity ranges	6 sensitivity ranges
Field of view	Hydrogen: horizontal - 90 °, vertical 90 ° For other fuels: horizontal - 80 °, vertical - 80 °
Coverage area	12,999 ft^3 (3962 m^3)
Temperature range	Operating: -76 to +185 °F (-60 to +85 °C) Storage: -76 to +185 °F (-60 to +85 °C)
Humidity	Non-condensing relative humidity up to 100%

Table 3: Electrical specifications

Operating voltage	24 Vdc nominal (18-32 Vdc)
Cable entries	2 x ¾-in. - 14 NPT conduits or 2 x M25 x 1.5 mm ISO
Electrical input protection	According to EN 50130
Electromagnetic compatibility	EMI/RFI protected to EN61000-6-3 and EN 50130
Electrical interface	The detector includes 17 terminals and one wiring option

Table 4: Typical power consumption (24 Vdc)

Mode	mA	Watts
Normal power consumption without heater	60	1.4
Normal power consumption without heater, with alarm	90	2.2
Low power mode heater with alarm	140	3.4
Standard power mode heater with alarm	280	6.7

Table 5: Outputs

Relays	Alarm, fault, and auxiliary SPST volt-free contacts rated 2 A at 30 VDC
Analog output default(1)	Analog port malfunction: 0 V (<0.5 V) Normal: 2 V ± 0.3 V Alarm/explosion: 5 V ± 0.3 V
0-20 mA (stepped) default(1)	Fault: 0 ± 1 mA Built-in test (BIT) fault: 2 mA ± 0.3 mA Normal: 4 mA ± 0.3 mA Warning: 16 mA ± 0.3 mA Alarm: 20 mA ± 0.3 mA
HART® protocol	HART communication on the 0-20 analog current (FSK) used for maintenance, configuration changes, and asset management, available in mA source output wiring options

Table 5: Outputs *(continued)*

RS-485	RS-485 Modbus®-compatible communication link that can be used in computer controlled installations

(1) *This output is configurable.*

Table 6: Mechanical specifications

Enclosure options	Electropolished stainless steel 316 Heavy duty copper free aluminum (less than 1%), polyurethane painted
Mounting	Electropolished stainless steel 316
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

Approvals

For approvals information, see Rosemount 975 Series Certification Information.

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For more information: **Emerson.com/global**

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