Product Data Sheet
00813-0100-4035, Rev AA
October 2021

Rosemount™ 935

Open Path Combustible Gas Detector

The Rosemount 935 Open Path Gas Detector provides continuous monitoring for combustible hydrocarbon gases utilizing infrared flash technology in harsh environments where dust, fog, rain, snow, or vibration can cause a high reduction of signal.

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Typical applications

Note
Typically used in perimeter monitoring and fence control

- Offshore platforms and floating production storage and offloading (FPSOs)
- Petrochemical plants
- Chemical processing plants
- Gas filling and distribution terminals
- Gas transport and pipelines

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Features and benefits

- Detects combustible hydrocarbon gases including alkanes (methane to hexane) and ethylene at up to 660 ft. (200 m)
- Accurate and reliable high-speed response in under three seconds
- Utilizes infrared flash technology
- High immunity to false alarms
- Built-in event recorder – real time record of the last 256 events
  - Built-in data logger (records up to 256 events)
- Strengthened reliability and durability with a massive three-year warranty
- Easy installation and maintenance
- Heated window for superb performance in harsh weather conditions (snow, ice, or condensation)
- Detection of a cloud of gas at very low concentrations, up to 95 percent obscuration
- User programmable via HART® or RS-485 Modbus® protocols compatible with modern user interface for ease of use
- Certified performance/Hazardous Area approved (FM/ATEX/IECEx and more) for location in zone 1 areas and 3rd party Performance approved (FM, DNV)
- Safety Integrity Level SIL2 (TÜV)
- High reliability - MTBF - minimum 100,000 hours

Ordering information

You can order the Rosemount Rosemount 935 as separate parts: source (PN 935TXFXXXXX), detector (PN 935R1F00XXXX), and accessories.

- Accurate and reliable high-speed response in under three seconds
- Utilizes infrared technology
- High immunity to false alarms
- Easy installation and maintenance

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Online product configurator

Many products are configurable online using our product configurator.

Visit our website to start. With this tool's built-in logic and continuous validation, you can configure your products more quickly and accurately.

Model codes

Model codes contain the details related to each product.

Exact model codes will vary; examples of typical model codes are shown in Source (Transmitter) and Detector (Receiver).

Source (Transmitter)

935T1F002SA1

Detector (Receiver)

935R1F012SA1

Specifications and options

See Specifications for more details on each configuration.

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment.

Source (Transmitter)

Required model components

Model

Code	Description
935	Rosemount 935 Combustible Open Path Gas Detector Source (Transmitter)

Transmitter range

Code	Description
T1	Transmitter - Range of 23 to 66 ft (7 to 20 m)
T2	Transmitter - Range of 50 to 132 ft (15 to 40 m)
T3	Transmitter - Range of 115 to 330 ft (35 to 100 m)
T4	Transmitter - Range of 265 to 660 ft (80 to 200 m)

Gas calibration

Code	Description
F00	Transmitter

Housing style / conduit

Code	Material	Measurement
2S	Stainless steel	¾-in NPT
4S	Stainless steel	M25

Product certifications

Code	Description
A1	ATEX and IECEx
A2	FM
E2	INMETRO
EM	CU TR (EAC)

Detector (Receiver)

Required model components

Model

Code	Description
935	Combustible Open Path Gas Detector (Receiver)

Receiver selection

Code	Description
R1	Receiver

Gas calibration

Code	Description
F01	Receiver for combustible gases Methane full scale 5 LEL.m (default)

Housing style / conduit

Code	Material	Measurement
2S	Stainless steel	¾-in NPT
4S	Stainless steel	M25

Product certifications

Code	Description
A1	ATEX and IECEx
A2	FM
E2	INMETRO
EM	CU TR (EAC)

Specifications

General specifications

Detected gases: C1 - C8 selective gases

Detection distance range: Table 1

Table 1: Model Numbers and Installation Distances

Model number	Detector	Source	Minimum installation distance	Maximum installation distance
935	R1F00XXXX	T1FXXXXXX	23 ft. (7 m)	66 ft. (20 m)
935	R1F00XXXX	T2FXXXXXX	50 ft. (15 m)	132 ft. (40 m)
935	R1F00XXXX	T3FXXXXXX	115 ft. (35 m)	330 ft. (100 m)
935	R1F00XXXX	T4FXXXXXX	265 ft. (80 m)	660 ft. (200 m)

Response time: 3 sec to T90

Spectral response: 2.0 - 3.0 micron

Sensitivity range:

		Full scale LEL.m	Warning LEL.m	Alarm LEL.m
Gas 1	Methane	5	1	3
Gas 2	Propane	5	1	3
Gas 3	Ethylene	8	1.6	4.8

Field of view: Line of sight

Alignment tolerance:	±0.5 °
Drift:	±7.5% of the reading or ±4% of the full scale (whichever is greater)
Minimum detectable gas volume:	0.15 LEL.m
Temperature range:	-67 °F (-55 °C) to 149 °F (65 °C)
Immunity to false alarm:	Does not produce false alarm and is not influenced by solar radiation, hydrocarbon flames, and other external infrared (IR) radiation sources.

Electrical specifications

Operating voltage

18-32 Vdc

Power consumption

Table 2: Detector and Source Maximum Power Consumption

	Without heated optic (max.)	With heated optice (max.)
Detector	150 mA	300 mA
Source	200 mA	300 mA

Electrical input protection

The input circuit is protected against voltage-reversed polarity, voltage transients, surges, and spikes, according to EN50270.

Electrical outputs

- 0-20 mA current output: The 0-20 mA is an isolated sink option. You can also configure this output as source (see Wiring configurations).
  The maximum permitted load resistance is 500 Ω.
- Communication network: The detector is equipped with an RS-485 communication link that can be used in installations with computerized controllers.
  Communication is compatible with the Modbus® protocol.
  - This protocol is standard and widely used.
  - It enables continuous communication between a single standard Modbus controller (master device) and a serial network of up to 247 detectors.
  - It enables connection between different types of Rosemount detectors or other Modbus devices to the same network.
- HART® protocol: A digital communication protocol used to communicate between intelligent field instruments and the host system.
  Through the HART protocol, the detector can:
  - Display setup.
  - Reconfigure setup.
  - Display and determine the detector status.
  - Perform detector diagnostics.
  - Troubleshoot.

Power consumption

Table 3: Detector and Source Maximum Power Consumption

	Without heated optic (max.)	With heated optic (max.)
Detector	200 mA	250 mA
Source	200 mA	250 mA

Electrical input protection

The input circuit is protected against voltage-reversed polarity, voltage transients, surges, and spikes according to EN50270.

Mechanical specifications

Enclosure

The detector, source, and tilt mount are stainless steel, 316 electro chemical, and passivized coating.

Explosion proof

ATEX and IECEx

Ex II 2(2) G D

Ex db eb ib [ib Gb] IIB+H2 T4 Gb

Ex tb [ib Db] IIIC T135 °C Db

Water and dust tight

IP66 and IP68

NEMA® 250 Type 6p

Electrical modules

Conformal coated

Electrical connection

Two options, specified at time of order:

- 2 x M25 (ISO)
- 2 x ¼-in.-14 national pipe thread (NPT) conduits

Dimensions

- Detector: 10.5 x 5.1 x 5.1 in. (267 x 130 x 130 mm)
- Source: 10.5 x 5.1 x 5.1 in. (267 x 130 x 130 mm)
- Tilt mount: 4.7 x 4.7 x 5.5 in. (120 x 120 x 140 mm)

Weight

Detector: 11 lb. (5 kg)

Source: 11 lb. (5 kg)

Tilt mount: 4.2 lb. (1.9 kg)

Environmental specifications

The Rosemount 935 system is designed to withstand harsh environmental conditions.

The source and detector units compensate for adverse conditions while maintaining accuracy.

High temperature

The Rosemount 935 conforms to DNVGL-CG-0339, class D.

Operating temperature	149 °F (65 °C)
Storage temperature	149 °F (65 °C)

Low temperature

The Rosemount 935 system conforms to DNVGL-CG-0339, class D.

Operating temperature	-67 °F (-55 °C)
Storage temperature	-67 °F (-55 °C)

Humidity

The Rosemount 935 confirms to DNVGL-CG-0339, class B.

Enclosure

The Rosemount 935 system conforms to DNVGL-CG-0339, class C.

Water and dust

- IP68 per EN60529
- IP66 per EN60529

Dust	Completely protected against dust.
Liquids	Protected against immersion between 5.9 in. (15 cm) and 3.3 ft. (1 m) in depth. Protected against water jets from all directions.

Vibration

The Rosemount 935 system conforms to DNVGL-CG-0339, class B.

Electromagnetic compatibility (EMC)

This product is in conformance with EMC per EN50270.

Radiated emission	EN55022
Conducted emission	EN55022
Radiated immunity	EN61000-4-3
Conducted immunity	EN61000-4-6
Electrostatic discharge (ESD)	EN61000-4-2
Burst	EN61000-4-4
Surge	EN61000-4-5
Magnetic field	EN61000-4-8

To fully comply with EMC directive 2014/30/EU and protect against interference caused by radio frequency interference (RFI) and electromagnetic interference (EMI), the cable to the detector must be shielded, and the detector must be grounded. Ground the shield at the detector end.

Product certification

The open path Rosemount 935 is approved for the following certification:

- ATEX, IECEx
- FM/FMC
- SIL-2
- Functional approval

ATEX and IECEx

The Rosemount 935 is approved per:

Ex II 2(2) G D

Ex db eb ib [ib Gb] IIB+H_2 T4 Gb

Ex tb [ib Db] IIIC T135 °C Db

Ta = -55 °C to +65 °C

FM/FMC

The Rosemount 935 is approved to FM/FMC explosion proof per:

- Class I, Div. 1 Group B, C, and D, T6 -50 °C ≤ T_a ≤ 65 °C
- Dust ignition proof - Class II/III Div. 1, Group E, F, and G
- Ingress protection - IP66 & IP68, NEMA® 250 Type 6P

SIL-2

The Rosemount 935 is TUV approved for SIL-2 requirements per IEC61508.

The alert condition according to SIL-2 can be implemented by alert signal via 0-20 mA current loop.

For more details and guidelines on configuring, installing, operating, and servicing, see SIL-2 Features and TUV report number 968/EZ619.00/13.

Functional approval

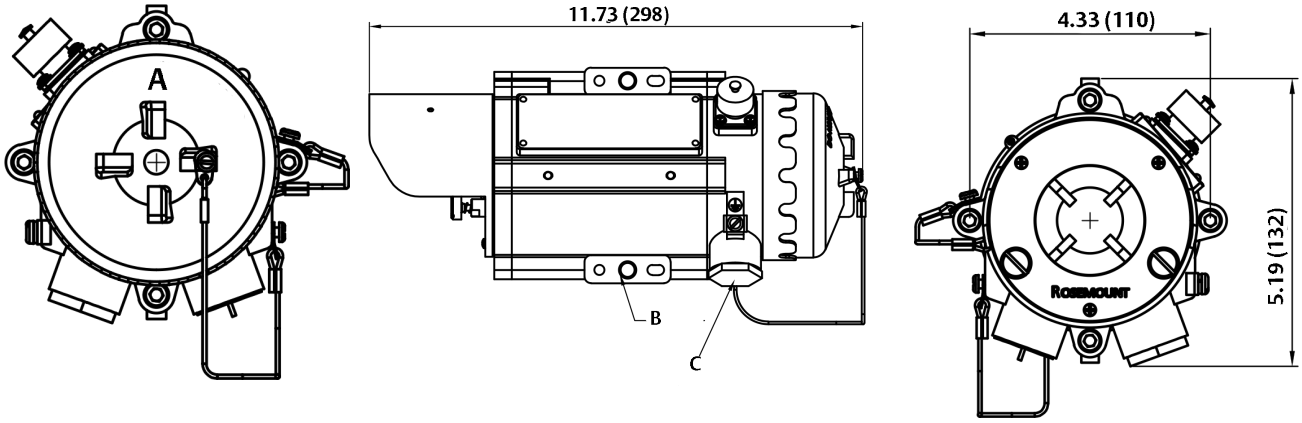
The Rosemount 935 was functionally approved per FM6325.

The Rosemount 935 was functionally tested by FM per EN60079-29-4.

Dimensional drawings

Figure 1: Gas Detector Assembly

Dimensions are in inches [millimeters].



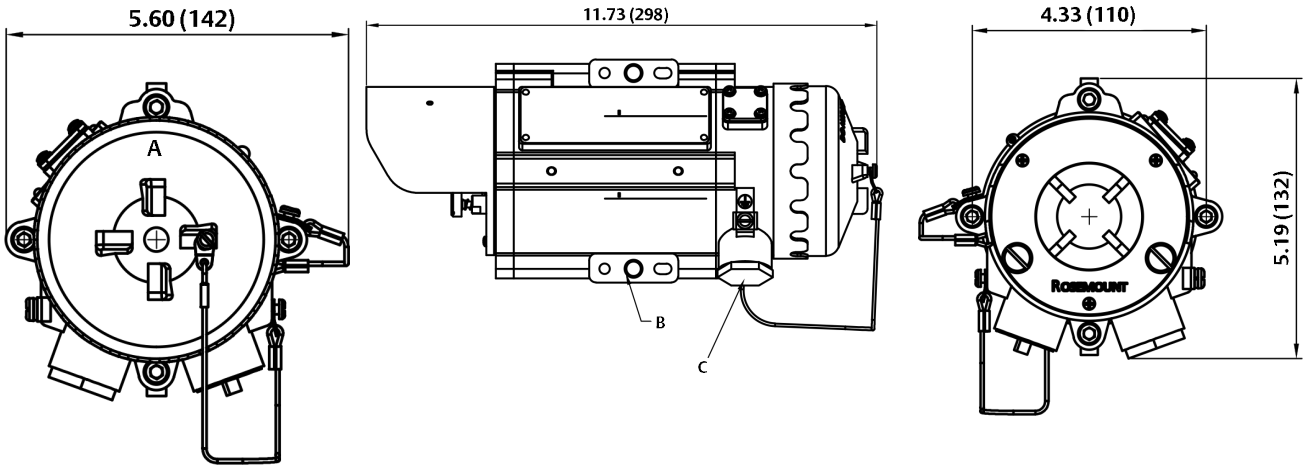
A. Do not open while energized
B. Two mounting option locations for the tilt mount using a M10x1.5 mm ISO bolt
C. Two conduit entry locations, M25x1.5 mm ISO or ¾-in. NPT.

Materials
Stainless steel 316L

Weight
11 lb. (5 kg) approximately

Figure 2: Source Assembly

Dimensions are in inches [millimeters].



A. Do not open while energized
B. M10x1.5
C. Two conduit entry locations, M25x1.5 mm ISO or ¾-in. NPT

Materials
Stainless steel 316L

Weight
11 lb. (5 kg) approximately

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For more information: **www.emerson.com**

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