

# Rosemount™ 936

## Open Path Toxic Gas Detectors



# 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
- Agriculture
- Food and beverage
- Waste management
- Water treatment
- Pharmaceutical
- Large storage areas and buildings

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## Features and benefits

- One person installation and low maintenance
- Factory calibrated
- Accurate and reliable high-speed response in under 3 seconds
- Automatic gain control ensures accurate detection in challenging conditions with up to 95 percent signal obscuration
- Three-year warranty
- High false alarm immunity
- Heated optics for operation in challenging conditions
- Easy to use, field configurable via HART® or RS-485 Modbus®
- High reliability-MTBF-minimum 100,000 hours

# Ordering information

You can order the Rosemount 936 as separate parts: source (PN 936TXT00XXXX), detector (PN 936RT12XXXXX), and accessories.



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

[CONFIGURE >](#)

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## Online product configurator

Many products are configurable online using our Product Configurator. See [Emerson.com/Global](#) 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; an example of a typical model code is shown in [Source \(Transmitter\)](#) and [Detector \(Receiver\)](#).

### Source (Transmitter)

936T1T00F002SA1

### Detector (Receiver)

936R1T262SA1

## 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                                 |
|------|---------------------------------------------|
| 936  | Open Path Gas Detector Source (Transmitter) |

**Transmitter range**

| Code | Description                                             |
|------|---------------------------------------------------------|
| T1   | Transmitter - Range of 17 ft. (5 m) to 52 ft. (16 m)    |
| T2   | Transmitter - Range of 46 ft. (14 m) to 132 ft. (40 m)  |
| T3   | Transmitter - Range of 115 ft. (35 m) to 200 ft. (60 m) |

**Gas calibration**

| Code | Description |
|------|-------------|
| T00  | 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        |
| A3   | CSA C/US              |
| E2   | InMetro (pending)     |
| EM   | TR CU (EAC) (pending) |
| EP   | Republic of Korea     |

**Detector (Receiver)****Required model components****Model**

| Code | Description                             |
|------|-----------------------------------------|
| 936  | Toxic Open Path Gas Detector (Receiver) |

**Receiver selection**

| Code | Description |
|------|-------------|
| R1   | Receiver    |

**Gas calibration**

| Code | Description                 |
|------|-----------------------------|
| T26  | Hydrogen sulfide (receiver) |

| Code | Description        |
|------|--------------------|
| T27  | Ammonia (receiver) |

### Housing style / conduit

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

### Product certifications

| Code | Description           |
|------|-----------------------|
| A1   | ATEX and IECEx        |
| A3   | CSA C/US              |
| E2   | InMetro (pending)     |
| EM   | TR CU (EAC) (pending) |
| EP   | Republic of Korea     |

# Technical specifications

## General specifications

### Detected gases

- Hydrogen sulfide (H<sub>2</sub>S) and Sulfur dioxide (SO<sub>2</sub>)
- Ammonia (NH<sub>3</sub>)

**Table 1: Detection Distance Range**

| Detector                               | Source   | Minimum installation distance | Maximum installation distance |
|----------------------------------------|----------|-------------------------------|-------------------------------|
| <b>H<sub>2</sub>S / SO<sub>2</sub></b> |          |                               |                               |
| RT126XXX                               | T1T00XXX | 17 ft. (5 m)                  | 52 ft. (16 m)                 |
| RT126XXX                               | T2T00XXX | 46 ft. (14 m)                 | 132 ft. (40 m)                |
| RT126XXX                               | T3T00XXX | 115 ft. (35 m)                | 200 ft. (60 m)                |
| <b>NH<sub>3</sub></b>                  |          |                               |                               |
| R1T127XXX                              | T1T00XXX | 17 ft. (5 m)                  | 52 ft. (16 m)                 |
| R1T127XXX                              | T2T00XXX | 46 ft. (14 m)                 | 132 ft. (40 m)                |
| R1T127XXX                              | T3T00XXX | 115 ft. (35 m)                | 200 ft. (60 m)                |

### Response time

< 3 sec

### Spectral response

200 to 300 nm

### Sensitivity range

| Full scale | Warning   | Alarm     |
|------------|-----------|-----------|
| 500 ppm/m  | 100 ppm/m | 300 ppm/m |

### Field of view

Line of sight

### Alignment tolerance

±1 degree

### Minimum detectable gas volume

50 ppm/m

### Temperature range

-67 °F (-55 °C) to 149 °F (65 °C)

### Immunity to false alarm

Does not produce a false alarm and is not influenced by solar radiation, hydrocarbon flames, or other external infrared radiation sources.

## Electrical specifications

### Operating voltage

24 Vdc nominal (18–32 Vdc)

### Typical power consumption with heated optics

Detector: 135mA

Source: 150mA

### 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. The maximum permitted load resistance is 600  $\Omega$ .
- 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<sup>®</sup> 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<sup>®</sup> 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.

## Mechanical specifications

### Enclosure

The detector, source, and tilt mount are stainless steel, 316L electrochemical, 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

IP68 is rated for 7 ft. (2 m) depth for 45 minutes.

NEMA® 250 Type 6p

### Electrical connection

Two options, specified at time of order:

- 2 x M25 for International Organization on Standardization (ISO)
- 2 x ¼-in. -14 NPT conduits

### Dimensions

- Detector: 10.5 in. (267 mm) x 5.1 in. (130 mm) x 5.1 in. (130 mm)
- Source: 10.5 in. (267 mm) x 5.1 in. (130 mm) x 5.1 in. (130 mm)
- Tilt mount: 4.7 in. (119 mm) x 4.7 in. (119 mm) x 5.5 in. (140 mm)

### Weight

Detector: 11 lb.

Source: 11 lb.

Tilt mount: 4.2 lb. (1.9 kg)

## Environmental specifications

The Rosemount 936 system is designed to withstand harsh environmental conditions.

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

### High temperature

The Rosemount 936 is designed to meet DNVGL-CG-0039, class D.

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

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

### Low temperature

The Rosemount 936 is designed to meet DNVGL-CG-0039, Class D.

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

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

### Humidity

The Rosemount 936 is designed to meet DNVGL-CG-0339, class B.

### Enclosure

The Rosemount 936 is designed to meet 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 936 is designed to meet DNVGL-CG-0339, class B.

**Electromagnetic compatibility (EMC)**

This product is in conformance with EMC per EN50270.

|                                      |             |
|--------------------------------------|-------------|
| <b>Radiated emission</b>             | EN55022     |
| <b>Conducted emission</b>            | EN55022     |
| <b>Radiated immunity</b>             | EN61000-4-3 |
| <b>Conducted immunity</b>            | EN61000-4-6 |
| <b>Electrostatic discharge (ESD)</b> | EN61000-4-2 |
| <b>Burst</b>                         | EN61000-4-4 |
| <b>Surge</b>                         | EN61000-4-5 |
| <b>Magnetic field</b>                | 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.

## Accessories

| Model    | Product Description                                           |
|----------|---------------------------------------------------------------|
| 888270   | Tilt Mount                                                    |
| 799255   | Wall Mount                                                    |
| 799225   | Pole Mount (U-Bolt 4-5")                                      |
| 888140   | Pole Mount (U-Bolt 2-3")                                      |
| 888355-2 | Duct Mount                                                    |
| 888931   | Air Shield                                                    |
| 888263   | Protective Cover                                              |
| 888897-1 | 936 H2S Comm Kit including Auxliery Harness IS/RS485 and HART |
| 888897-2 | 936 NH3 Comm Kit including Auxliery Harness IS/RS485 and HART |
| 888280-2 | Check Filter NH3                                              |
| 888280-1 | Check Filter H2S                                              |
| 888820   | Auxiliary Harness IS/RS 485 and HART                          |
| 888810   | HART Handheld Diagnostic Kit                                  |
| 794079   | USB / RS485 Harness Converter Kit                             |

# Approvals

## ATEX, IECEx

The Rosemount 936 is approved per ATEX and IECEx certifications:

- ATEX Ex II 2(2)G D

Ex tb [ib Db] IIIC T135 °C Db

Ex db eb ib [ib Gb] IIB+H<sub>2</sub> T4 Gb

- T<sub>Ambient</sub> -55 °C to +65 °C

This product is suitable for use in hazardous zones 1 and 2 with IIB+H<sub>2</sub> group vapors present, and zones 21 and 22 with IIIC combustible dust types.

## SIL-2

The Rosemount 936 is TUV approved for SIL-2 requirements per IEC61508.

According to SIL-2 requirements, the alert condition can be implemented by an alert signal via the 0–20 mA current loop.

For more details and guidelines on configuring, installing, operating, and servicing, see [SIL-2 Features](#), and TUV report no. 968/FSP 1276.04/20.

## TR CU (EAC)

1 Ex db eb ib [ib Gb] IIB+H<sub>2</sub> T4 Gb X

Ex tb IIIC T135 °C Db X

-55 °C ≤ Ta ≤ +65 °C

## Inmetro (UL)

The product complies with Inmetro approval per the following standards:

ABNT NBR IEC 60079-0

ABNT NBR IEC 60079-1

ABNT NBR IEC 60079-7

ABNT NBR IEC 60079-11

ABNT NBR IEC 60079-28

ABNT NBR IEC 60079-31

### Marking:

Ex db eb ib [ib Gb] IIB+H<sub>2</sub> T4 Gb

Ex tb [ib Db] IIIC T135 °C Db

(-55 °C ≤ Ta ≤ +65 °C)

Certificate number UL-BR 19.0276X (Rosemount) and UL-BR 22.4059X (Spectronix).

## CSA C/US

The Rosemount 936 is approved per CSA C/US for hazardous and ordinary locations:

### Canada

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

Ex tb [ib Db] IIIC T135°C Db

T<sub>a</sub> = -55 °C to +65 °C

### USA

Class I Zone 1 AEx db eb ib [ib Gb] IIB+H2 T4 Gb

Zone 21 AEx tb [ib Db] IIIC T135°C Db

T<sub>a</sub> = -55 °C to +65 °C



The Rosemount 936 is a "Class 1 Laser Product" per IEC 60825-1: 2014 ed. 05.

## Performance Approval

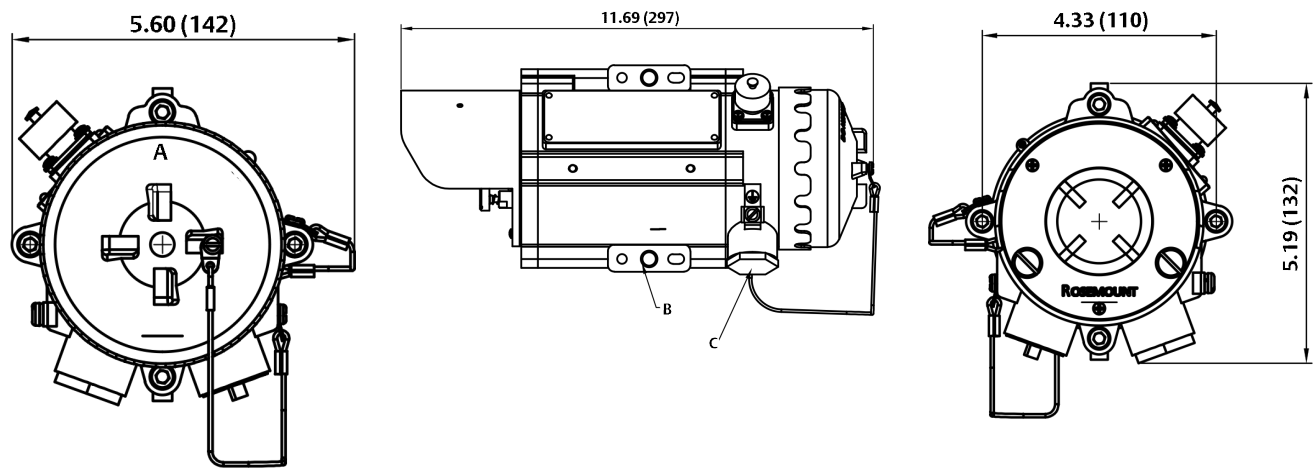
**ANSI/ISA-92.00.04-2014**

**UL 920004: 2014**

# Dimensional drawings

Figure 1: Gas Detector Assembly

Dimensions are in inches [millimeters].

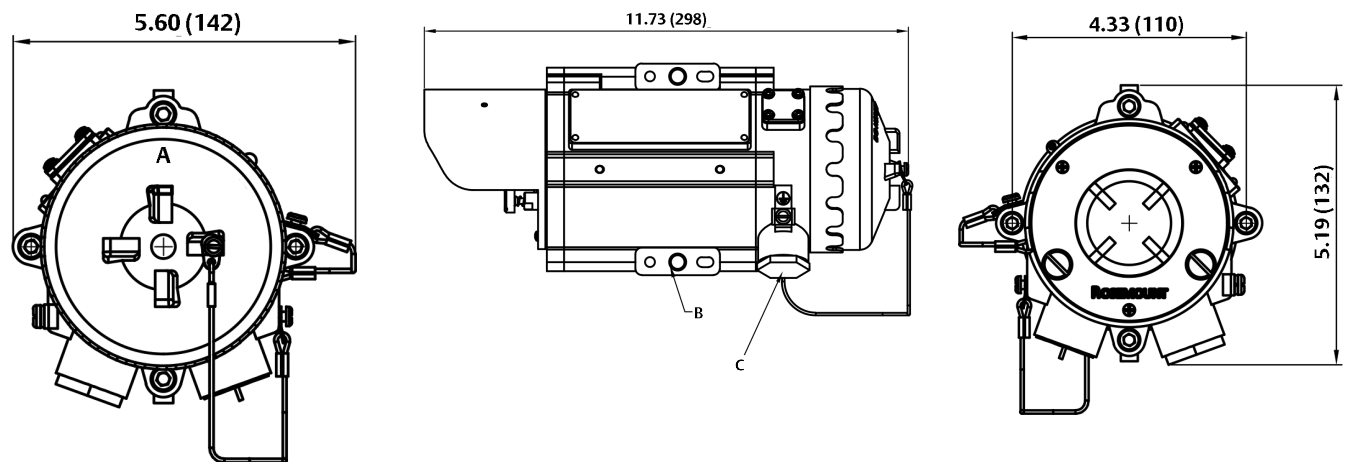


- A. Do not open while energized
- B. M10 x 1.5
- C. Two conduit entry locations, M25 x 1.5 mm ISO or 3/4-in. NPT.

| Material                    |
|-----------------------------|
| Stainless steel - 316L      |
| Weight                      |
| 11 lb. (5 kg) approximately |

**Figure 2: Gas UV Source Assembly**

Dimensions are in inches [millimeters].



- A. Do not open while energized
- B. M10 x 1.5
- C. Two conduit entry locations, M25 x 1.5 mm ISO or 3/4-in. NPT.

| Material                    |
|-----------------------------|
| Stainless steel - 316L      |
| Weight                      |
| 11 lb. (5 kg) approximately |

For more information: [Emerson.com/global](https://emerson.com/global)

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