

Rosemount™ 928 Wireless Gas Monitor

Integrated Wireless Gas Monitoring



The Rosemount 928 Wireless Gas Monitor is the first integrated *WirelessHART*® toxic and combustible gas monitoring solution with a tool-less, hot-swappable sensor from Emerson. The 928 extends detection coverage to remote installations, eliminates wiring costs, and reduces installation and commissioning times.

- Hot-swappable sensor module with end-of-life diagnostics can be installed in the field without tools.
- Hazardous location approvals for worldwide use.
- Large liquid crystal display clearly shows gas concentration and transmitter diagnostics.
- Optional discrete output for activating field alarms.

Features

WirelessHART[®] communication

Traditional electrochemical sensor technology is proven and reliable, but conventional products require a wired infrastructure for power and signal communication. The Rosemount 928 requires no wired infrastructure and dramatically reduces installation and maintenance costs.

Hot-swappable power module

The device uses a replaceable, intrinsically safe lithium-thionyl chloride power module.

The power module provides a service life of over three years when used with the Rosemount 628EC Toxic Gas Sensor and 1.5 years when used with the Rosemount 628MP Combustible Gas Sensor⁽¹⁾ and can be easily exchanged in the field in hazardous locations.

High performance monitoring

Table 1: Gas monitoring ranges

Gas	Range	Accuracy	T20	T50	T90	Default alarm	Zero drift	Relative humidity	Operating temperature range
H ₂ S	0-100 parts per million (ppm)	±3 ppm or 10 % of reading	< 8 seconds	< 10 seconds	< 45 seconds	10 ppm	< 5 % per annum	10-95 %	-40 to +140 °F -40 to +60 °C
CO	0-1,000 ppm	±6 ppm or 10 % of reading	< 7 seconds	< 12 seconds	< 29 seconds	100 ppm	< 5 % per annum	10-95 %	-22 to +140 °F -30 to +60 °C
O ₂	0-25 % by volume	±0.5 % of reading (O ₂ ≥ 4 %) ±1.2 % of reading (O ₂ < 4 %)	< 2 seconds	< 4 seconds	< 15 seconds	19.5 %	< 5 % per annum	5-95 %	-22 to +140 °F -30 to +60 °C
Combustible	0 - 100 % lower explosive limit (LEL)	±3 % LEL (methane) ±5 % LEL (hydrogen)	N/A	< 16 seconds	< 24 seconds	20 % LEL	0 % per annum	0 - 95 % non-condensing	-40 to +122 °F -40 to +50 °C

Table 2: Combustible gas classification

Gas	Formula	Classification
Butane	C ₄ H ₁₀	Light gas
Ethane	C ₂ H ₆	Light gas
Hydrogen	H ₂	Hydrogen
Isobutane	C ₄ H ₁₀	Light gas

(1) Power module service life depends on wireless update rate, local display settings, and ambient conditions.

Table 2: Combustible gas classification (continued)

Gas	Formula	Classification
Isobutylene	C ₄ H ₈	Light gas
Isopropanol	C ₃ H ₈ O	Light gas/medium gas
Methane	CH ₄	Methane/natural gas
Pentane	C ₅ H ₁₂	Medium gas
Propane	C ₃ H ₈	Light gas
Propylene	C ₃ H ₆	Light gas
Acetone	C ₃ H ₆ O	Medium gas
Ethylene	C ₂ H ₄	Light gas
Heptane	C ₇ H ₁₆	Medium gas
MEK	C ₄ H ₈ O	Medium gas/heavy gas
Octane	C ₈ H ₁₈	Heavy gas
Styrene	C ₈ H ₈	Heavy gas
Toluene	C ₇ H ₈	Heavy gas
Xylene	C ₈ H ₁₀	Heavy gas

Hot-swappable sensor

The Rosemount 928 uses the Rosemount 628 series of hot-swappable gas sensor modules that can be installed in the field with one hand and no tools.

The 628 Universal Gas Sensor is a smart sensor. As such, it retains its own calibration information. It must be connected to a Rosemount 928 Transmitter to calibrate, but the calibration settings are stored in the sensor itself rather than in the transmitter. The 628 Sensor may be uninstalled from one 928 Transmitter and reinstalled in another transmitter without affecting its calibration.

The device automatically recognizes the sensor. Built-in end-of-life diagnostics on the H₂S and CO sensors alert you when sensor replacement is necessary.

Built for harsh environments

The Rosemount 928 is designed to operate in ambient temperatures ranging from -40 °F to +140 °F (-40 °C to +60 °C). Ingress protection levels of IP66 are achieved with the Ingress Protection (IP) filter fitted to the Rosemount 628.

Ordering information

Typical model number: 928 X SS 00 2A I5 WA3 WK1 B4

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Standard options

The starred offerings (★) represent the most common options and should be selected for the fastest delivery. The non-starred offerings are subject to additional delivery lead time.

Product description

Code	Description	
928	Wireless Gas Monitor	★

Transmitter output

Code	Description	
X	Wireless	★

Sensor options

Code	Description	
SS	Sensor specified separately and shipped with the transmitter (requires specification of the Rosemount 628)	★
UT	Universal transmitter (no sensor specified)	★

Discrete output

Code	Description	
00	No discrete output; wireless communication only	★
01	Discrete output and wireless communication	★

Housing material

Code	Description	
2A	Aluminum ½-14 NPT conduit	★
2S	316 stainless steel ½-14 NPT conduit	★

Product certifications

Code	Description	
I5	USA Intrinsically Safe	★
I6	Canada Intrinsically Safe	★
I4	Japan Intrinsic Safety	★
I1	ATEX Intrinsic Safety	★

Code	Description	
I3	China Intrinsic Safety	★
I7	IECEX Intrinsic Safety	★
KQ	USA CSA ATEX Intrinsic Safety	★
NA	No approvals	★

Note

Options I4, I3, and I7 only available for Rosemount 628EC Sensors.

Wireless options

The starred offerings (★) represent the most common options and should be selected for the fastest delivery. The non-starred offerings are subject to additional delivery lead time.

Wireless update range, operating frequency, and protocol

Code	Description	
WA3	User configurable update rate, 2.4 GHz DSSS, IEC 65291 (<i>WirelessHART</i> ®)	★

Omnidirectional wireless antenna and SmartPower™ solutions

Code	Description	
WK1	External antenna, adapter for black power module (intrinsically safe [IS] power module sold separately)	★
WM1	Extended range, external antenna	★
WJ1	Remote antenna, adapter for black power module (IS power module sold separately)	★
WN1	High-gain remote antenna, adapter for black power module (IS power module sold separately)	★

Other options

Include with selected model number.

The starred offerings (★) represent the most common options and should be selected for the fastest delivery. The non-starred offerings are subject to additional delivery lead time.

Mounting bracket

Code	Description	
B4	Universal L mounting bracket for 2-in. (50.8 mm) pipe mounting, stainless steel brackets, and bolts	★

Configuration

Code	Description	
C1	Factory configuration date, descriptor, message fields, and wireless parameters	★

Quality documentation

Code	Description	
Q1	Certificate of Compliance	★

Rosemount 628 Universal Gas Sensor ordering information

Typical model number: 628 EC TO2 2 F

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Optimizing lead time

The starred offerings (★) represent the most common options and should be selected for the fastest delivery. The non-starred offerings are subject to additional delivery lead time.

Product description

Code	Description	
628	Universal Gas Sensor	★

Sensor technology

Code	Description	
EC	Electrochemical	★
MP	Combustible gas micro-electromechanical systems (MEMS)	★

Gas type

Code	Description	
T02	Hydrogen sulfide	★
A03	Oxygen	★
T04	Carbon monoxide	★
F41	Hydrocarbon and hydrogen gases, wireless	★

Unit of measurement

Code	Description	
1	% lower explosive limit (LEL)	★
2	Parts per million (ppm)	★
3	% by volume	★

Sensor range

Code	Description	
F	0-100 (for H ₂ S, hydrocarbon and hydrogen gases only)	★
D	0-25 (for O ₂ only)	
K	0-1,000 (for CO only)	

Spare parts

Description	Part number
Ingress Protection (IP) filter	00628-9000-0001
Spare B4 mounting bracket for Rosemount 928	03151-9270-0004

Specifications

Functional specifications

Measurement type

Gas concentration levels

- Hydrogen sulfide (H₂S): 0 - 100 ppm
- Carbon monoxide (CO): 0 - 1,000 ppm
- Oxygen depletion (O₂): 0 - 25 percent by volume
- Combustible: 0 - 100 percent lower explosive limit (LEL)

Sensor type

Tool-less hot-swappable cell module

Toxic gas: electrochemical sensor

Combustible gas: Micro-electromechanical systems (MEMS) sensor

Discrete output, Rosemount 928XSS01, 928XUT01

Maximum rating: 28 Vdc, 93 mA

On resistance: typical 1 Ohm

Wireless output

IEC 62591 (*WirelessHART*[®]) compliant, 2.4 GHz

Antenna radio frequency power output

External (WK option) antenna: Maximum of 10 mW (10 dBm) EIRP

Extended range, external (WM option) antenna: Maximum of 18 mW (12.5 dBm) EIRP

High gain, remote (WN option) antenna: Maximum of 40 mW (16 dBm) EIRP

Remote, extended (WJ option) antenna: Maximum of 18 mW (12.5 dBm) EIRP

Local display

The integral LCD display can display alert state and diagnostic information. Configurable to display updates at each wireless update.

Humidity limits

See [Table 1](#).

Maximum inputs for the Rosemount 928 (ordinary and intrinsically safe [IS] environments)

- 28 Volts
- 95 milliamps
- 650 milliwatts

Wireless update rate

User-selectable, 1 second to 60 minutes

Diagnostics

End-of-life sensor diagnostics for H₂S and CO only

Physical specifications

Electrical connections wireless power module

Replaceable, intrinsically safe lithium-thionyl chloride power module with PBT polymer enclosure. 5.1 years of life at one-minute update rate with Rosemount 628E Toxic Gas Sensor or 1.6 years of life at one-minute update rate with the Rosemount 628MF-F41 Combustible Gas Sensor.⁽²⁾

Materials of construction

Enclosure:

- Housing: Low-copper aluminum or 316 stainless steel
- Paint: Polyurethane
- Cover O-ring: Buna-N

Terminal block and power module pack: PBT

Antenna: PBT/PC integrated omnidirectional antenna

Conduit entries: ½-14 NPT

Environmental

Operating temperature: -40 to +140 °F (-40 to +60 °C)

Ingress protection: IP66 Ingress Protection (IP) filter

Switch terminals, Rosemount 928XSS01 and 928UXT01

Screw terminals permanently fixed to terminal block

(2) Reference conditions are 70 °F (21 °C) and routing data for three additional network devices.

Note

Continuous exposure to ambient temperature limits (less than -40 °F or greater than +122 °F [less than -40 °C or greater than +50 °C]) may reduce specified power module life by less than 20 percent.

Field Communicator connections

Communication terminals

Clips permanently fixed to terminal block

Rosemount 928 weight

Low-copper aluminum housing (2A ordering option): 73 ounces (2076 grams)

Stainless steel housing (2S ordering option): 143 ounces (4055 grams)

Enclosure ratings

Type 4X and IP66

Performance specifications

Electromagnetic compatibility (EMC)

All models: meet all relevant requirements of EN-61326-2-3: 2006

Vibration effect

Wireless output unaffected when tested according to the requirements of IEC60770-1 field or pipeline with high vibration level (10-60 Hz 0.2 mm displacement peak amplitude/60-2000 Hz 3g).

Wireless output unaffected when tested according to the requirements of IEC60770-1 field with general application or pipeline with low vibration level (10-60 Hz 0.15 mm displacement peak amplitude/60-500 Hz 2g).

Temperature guidelines

Sensor type	Operating limit	Transmitter storage limit	Sensor storage recommendation
H ₂ S	-40 to +140 °F -40 to +60 °C	-40 to +185 °F -40 to +80 °C	34 to 45 °F 1 to 7 °C
O ₂	-22 to +140 °F -30 to +60 °C	-40 to +185 °F -40 to +80 °C	34 to 45 °F 1 to 7 °C
CO	-22 to +140 °F -30 to +60 °C	-40 to +185 °F -40 to +80 °C	34 to 45 °F 1 to 7 °C
Combustible	-40 to +122 °F -40 to +50 °C	-40 to +185 °F -40 to +80 °C	-40 to +167 °F -40 to +75 °C

NOTICE

The electrochemical cells in toxic gas sensor modules have a limited shelf life. Store sensor modules in a cool location that is not excessively humid or dry. Storing sensor modules for long periods may shorten their useful service life.

Wireless transmission rate

User selectable from 1 second to 60 minutes.

Accuracy

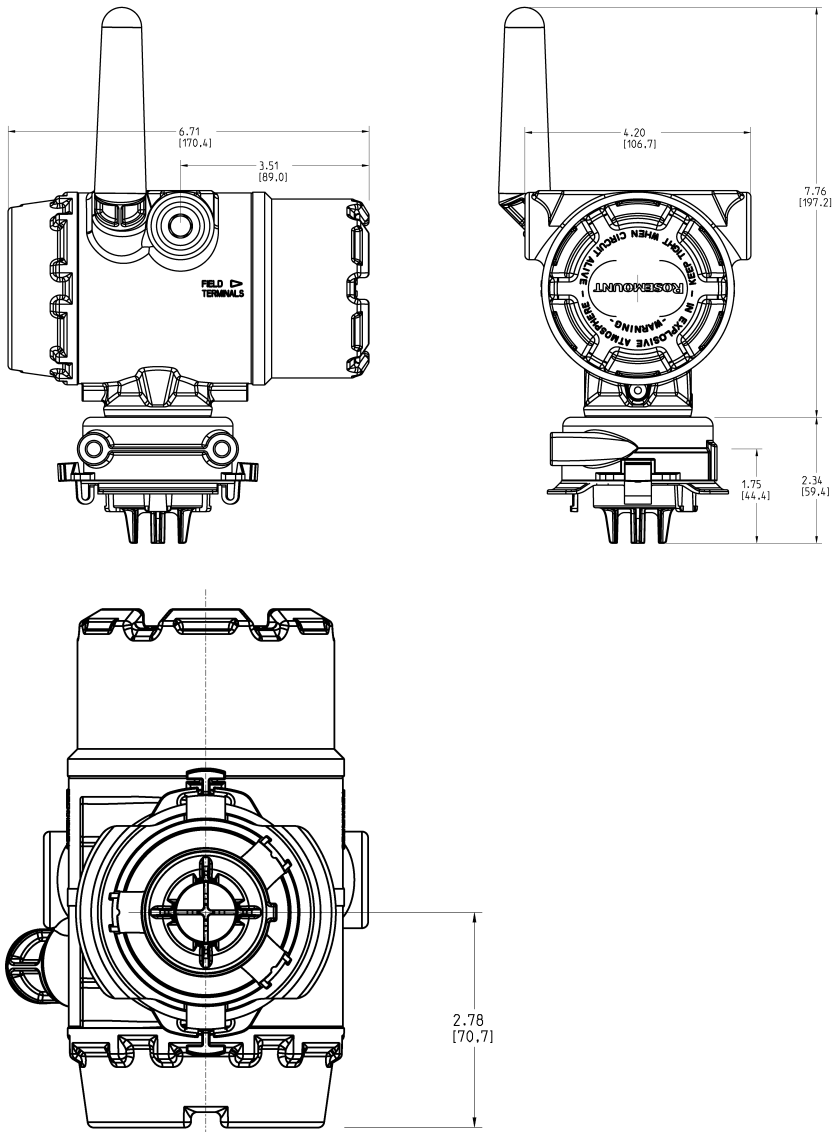
Refer to [Table 1](#).

Dimensional drawings

Note

Dimensions are in inches (millimeters).

Figure 1: Rosemount 928 with Rosemount 628EC Toxic Gas Sensor



Shown with digital display, 2.4 GHz/WirelessHART® antenna, Rosemount 628EC Sensor Module

Figure 2: Rosemount 928 with 628MP Combustible Gas Sensor

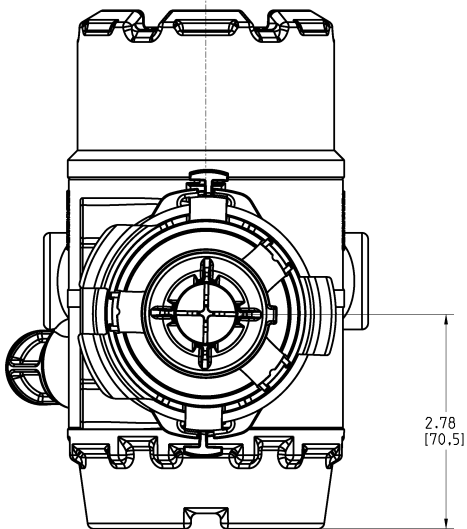
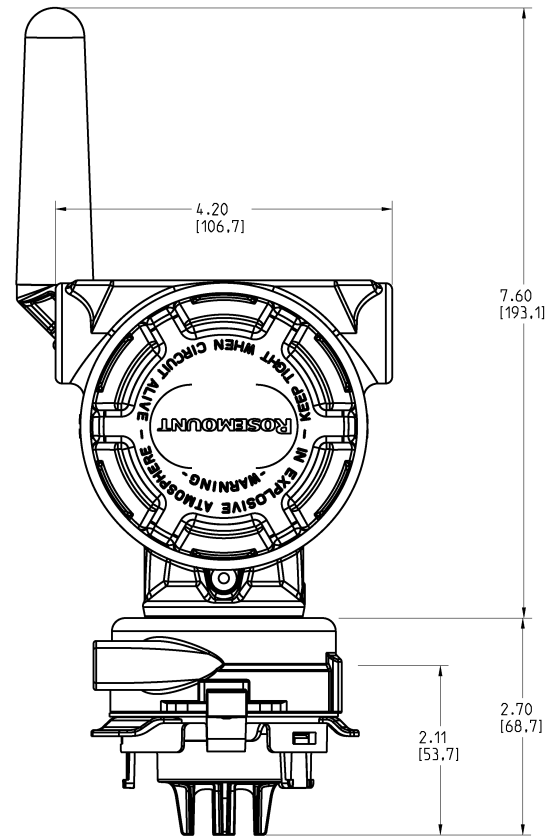
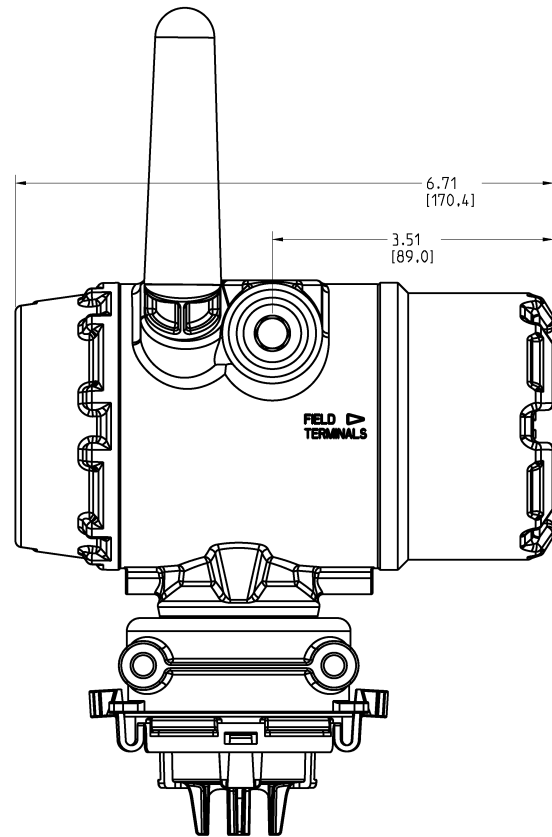
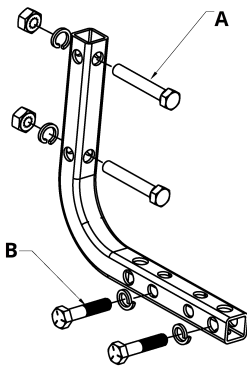
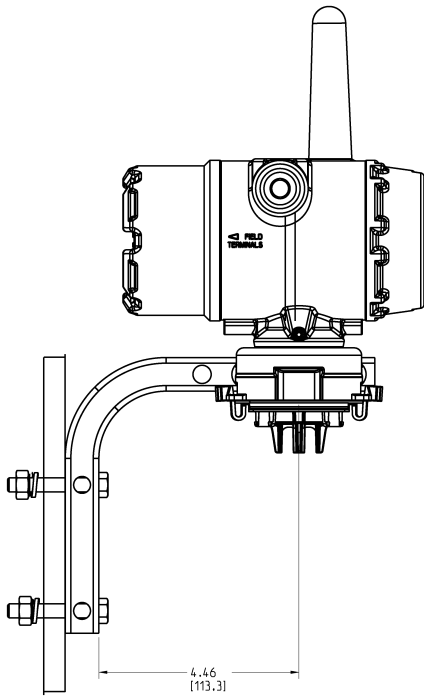
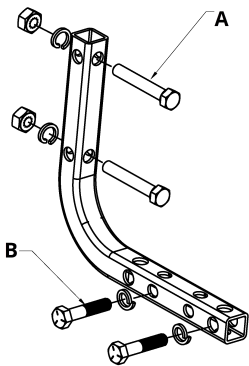
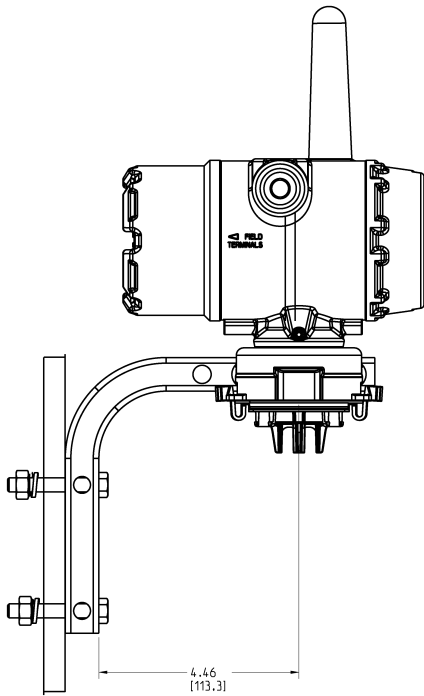


Figure 3: Pipe mounting



- A. 2-inch U-bolt for pipe mounting (clamp shown)
- B. 5/16 - 18 x 1 1/2 bolts for transmitter mounting

Figure 4: Panel mounting



- A. For panel mounting (not supplied)
- B. 5/16 - 18 x 1 1/2 bolts for transmitter mounting

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