Product Data Sheet
00813-0100-4928, Rev AJ
July 2023

Rosemount™ 928 Wireless Gas Monitor

Integrated Wireless Gas Monitoring

IEC WirelessHART

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

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

Features

*Wireless*HART® 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 has over three years of service life(1) and can be easily exchanged in the field in hazardous locations.

High performance monitoring

Table 1: Monitoring Ranges by Gas

Gas	Range	Accuracy	T20	T50	T90	Default alarm	Zero drift	Relative humidity	Operating temperature range
H_2S	0-100 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	0-1000 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% oxygen content of supply gas	< 2 seconds	< 4 seconds	< 15 seconds	19.5%	< 5% per annum	5-95%	-22 to +140 °F -30 to +60 °C

Hot-swappable sensor

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

The Rosemount 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 Rosemount 628 Sensor may be uninstalled from one Rosemount 928 Transmitter and reinstalled in another transmitter without affecting its calibration.

Contents

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

The device automatically recognizes the sensor. Built-in end-of-life diagnostics on the H_2S 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.

Specifications

Functional specifications

Measurement type

Gas concentration levels

- Hydrogen sulfide (H_2S): 0 - 100 ppm
- Carbon monoxide (CO): 0 - 1,000 ppm
- Oxygen depletion (O_2): 0 - 25% by volume

Sensor type

Tool-less hot-swappable electrochemical cell module

Discrete output, Rosemount 928XSS01, 928XUT01

Maximum rating: 28 Vdc, 100 mA

On resistance: typical 1 Ohm

Wireless output

IEC 62591 (*Wireless*HART®) 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 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 H_2S and CO only

Physical specifications

Electrical connections wireless power module

Replaceable, intrinsically safe lithium-thionyl chloride power module with PBT polymer enclosure. 5.8 years of life at one minute update rate.(2)

Materials of construction

Enclosure:

- Housing: low-copper aluminum or 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 national pipe thread (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

Field Communicator connections

Communication terminals

Clips 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.

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

NEMA® 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_2S	-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

Note

The electrochemical cells in 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.

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 times. 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 national pipe thread (NPT) conduit	★
2S	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	★

Wireless options

The starred offerings (★) represent the most common options and should be selected for the fastest delivery times. 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 (*Wireless*HART®)	★

Omnidirectional wireless antenna and SmartPower™ solutions

Code	Description	
WK1	External antenna, adapter for black power module (I.S. power module sold separately)	★
WM1	Extended range, external antenna	★
WJ1	Remote antenna, adapter for black power module (I.S. power module sold separately)	★
WN1	High-gain remote antenna, adapter for balck power module (I.S. 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 times. 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

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

Typical model number: 628 EC TO2 2 F

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Product description

Code	Description	
628	Universal Gas Sensor	★

Sensor technology

Code	Description	
EC	Electrochemical	★

Gas type

Code	Description	
T02	Hydrogen sulfide	★
A03	Oxygen	★
T04	Carbon monoxide	★

Unit of measurement

Code	Description	
2	ppm	★
3	% by volume	★

Sensor range

Code	Description	
F	0-100 (for H_2S only)	★
D	0-25 (for O_2 only)	
K	0-1000 (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

Product Certifications - 928 Wireless Gas Monitor

Rev 3.5

European Directive Information

A copy of the EC Declaration of Conformity can be found at the end of the Quick Start Guide. The most recent revision of the EC Declaration of Conformity can be found at www.Emerson.com/Rosemount.

Telecommunication compliance

All wireless devices require certification to ensure that they adhere to regulations regarding the use of the RF spectrum. Nearly every country requires this type of product certification. Emerson is working with governmental agencies around the world to supply fully compliant products and remove the risk of violating country directives or laws governing wireless device usage.

FCC and IC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: This device may not cause harmful interference. This device must accept any interference received, including interference that may cause undesired operation. This device must be installed to ensure a minimum antenna separation distance of 20 cm from all persons.

Ordinary Location Certification

The transmitter has been examined and tested to determine that the design meets the basic electrical, mechanical, and fire protection requirements by a Nationally Recognized Test Laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

Installing in North America

The US National Electrical Code® (NEC) and the Canadian Electrical Code (CEC) permit the use of Division-marked equipment in Zones and Zone-marked equipment in Divisions. The markings must be suitable for the area classification, gas, and temperature class. This information is clearly defined in the respective codes.

USA

I5 U.S.A. Intrinsically Safe (IS)

Certificate CSA 70138122

Standards FM 3600–2011, FM 3610–2010, UL Standard 50—Eleventh edition, UL 61010–1—3rd edition, ANSI/ISA–60079–0 (12.00.01)–2013, ANSI/ISA–60079–11 (12.02.01)–2014

Markings IS CL I, DIV 1, GP A, B, C, D T4 Ex ia IIC T4 Ga;
Class 1, Zone 0, AEx ia IIC T4 Ga;
T4 (-40 °C ≤ Ta ≤ +50 °C) when installed per Rosemount drawing **00928-1010;**
Type 4X

Table 2: Entity Parameters

Input (power) parameters	Output (alarm) parameters
Ui - 28 Vdc	Uo - 28 Vdc
Ii - 93.3 mA	Io -93.3 mA
Pi - 653 mW	Po - 653 mW
Ci - 5.72 nF	Co - 77 nF
Li - 0	Lo - 2 mH

Table 3: HART® Comm Parameters

Uo - 1.9 Vdc
Io - 32 µA

Special Conditions for Safe Use (X):

1. For use only with the Emerson Model 701PBKKF, the Computation Systems, Inc MHM-89004, or the Perpetuum Ltd. IPM71008/IPM74001.
2. The surface resistivity of the antenna is greater than 1 GΩ. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.
3. Substitution of Components may Impair Intrinsic Safety.

Canada

I6 Canada Intrinsically Safe (IS)

Certificate CSA 70138122

Standards CAN/CSA C22.2 No. 0-10, CAN/CSA C22.2 No. 94.2-15, CAN/CSA-60079-0 –2015, CAN/CSA-60079-11 – 2014, CAN/CSA-C22.2 No. 61010-1 – 2012

Markings IS CL I, DIV 1, GP A, B, C, D T4;
Ex ia IIC T4 Ga;
T4 (-40 °C ≤ Ta ≤ +50 °C) when installed per Rosemount drawing **00928-1010**;
Type 4X

Refer to Table 2.

Special Conditions for Safe Use (X):

1. For use only with the Emerson Model 701PBKKF, the Computations Systems, Inc MHM-89004, or the Perpetuum Ltd. IPM71008/IPM74001.
   Pour utilization uniquement avec Emerson Model 701PBKKF, Computation Systems, Inc MHM-89004, ou Perpetuum Ltd. IPM71008/IPM74001.
2. The surface resistivity of the antenna is greater than 1 GΩ. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.
   La résistivité de surface du boÎtier est supérieure à un gigaohm. Pour éviter l'accumulation de charge électrostatique, ne pas frotter ou nettoyer avec des produits solvants ou un chiffon sec.
3. Substitution of Components may Impair Intrinsic Safety
   La substitution de composants peut compromettre la sécurité intrinsèque.

Europe

I1 ATEX Intrinsically Safe (IS)

Certificate	Sira17ATEX2371X
Standards	EN IEC 60079-0:2018, EN 60079-11:2012
Markings	Ex II1 G Ex ia IIC T4 Ga; T4 (-40 °C ≤ Ta ≤ +50 °C) Type IP66

Refer to Table 2 and Table 3.

Special Conditions for Safe Use (X):

1. Under certain extreme circumstances, the non-metallic parts incorporated in the enclosure of this equipment may generate an ignition-capable level of electrostatic charge. Therefore the equipment shall not be installed in a location where the external conditions are conductive to the build-up of electrostatic charge on such surfaces. In addition, the equipment shall only be cleaned with a damp cloth.
2. The transmitter may contain more than 10% Aluminium and is considered a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact or friction.
3. The equipment shall be powered by Emerson 701PBKKF. Alternative power source shall be CSI MHM-89004 as these devices have output parameters that are equal to or less onerous than the parameters of the 701PBKKF.
4. Only the 375, 475, or AMS Trex communicators may be used with the 928.

I1 UKEX Intrinsically Safe (IS)

Certificate	CSAE21UKEX2219X
Standards	EN IEC 60079-0:2018, EN 60079-11:2012
Markings	Ex II1 G Ex ia IIC T4 Ga; T4 (-40 °C ≤ Ta ≤ +50 °C) Type IP66

Refer to Table 2 and Table 3.

Special Conditions for Safe Use (X):

1. Under certain extreme circumstances, the non-metallic parts incorporated in the enclosure of this equipment may generate an ignition-capable level of electrostatic charge. Therefore the equipment shall not be installed in a location where the external conditions are conductive to the build-up of electrostatic charge on such surfaces. In addition, the equipment shall only be cleaned with a damp cloth.
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4. Only the 375, 475, or AMS Trex communicators may be used with the 928.

International

I7 IECEx Intrinsically Safe (IS)

Certificate	IECEx SIR 17.0091X
Standards	IEC 60079-0:2011, IEC 60079-11:2011
Markings	Ex ia IIC T4 Ga; T4 (-40 °C ≤ Ta ≤ +50 °C) Type IP66

Refer to Table 2 and Table 3.

Special Conditions for Safe Use (X):

1. Under certain extreme circumstances, the non-metallic parts incorporated in the enclosure of this equipment may generate an ignition-capable level of electrostatic charge. Therefore the equipment shall not be installed in a location where the external conditions are conductive to the build-up of electrostatic charge on such surfaces. In addition, the equipment shall only be cleaned with a damp cloth.
2. The transmitter may contain more than 10% Aluminium and is considered a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact or friction.
3. The equipment shall be powered by Emerson 701PBKKF. Alternative power source shall be CSI MHM-89004 as these devices have output parameters that are equal to or less onerous than the parameters of the 701PBKKF.
4. Only the 375, 475, or AMS Trex communicators may be used with the 928.

China

I3 NEPSI Intrinsically Safe (IS)

Certificate	GYJ18.1438X
Standards	GB 3836.1-2010, GB 3836.4-2010, GB 3836.20-2010
Markings	Ex ia IIC T4 Ga (-40 °C ≤ Ta ≤ +50 °C)

Special Conditions for Safe Use (X):

See certificate.

Japan

I4 CML Intrinsically Safe (IS)

Certificate	CML 18JPN2345X
Standards	IEC 60079-0:2011, IEC 60079-11:2011
Markings	Ex ia IIC T4 Ga; T4 (-40 °C ≤ Ta ≤ +50 °C)

Special Conditions for Safe Use (X):

See certificate.

Brazil

IM INMETRO Intrinsically Safe

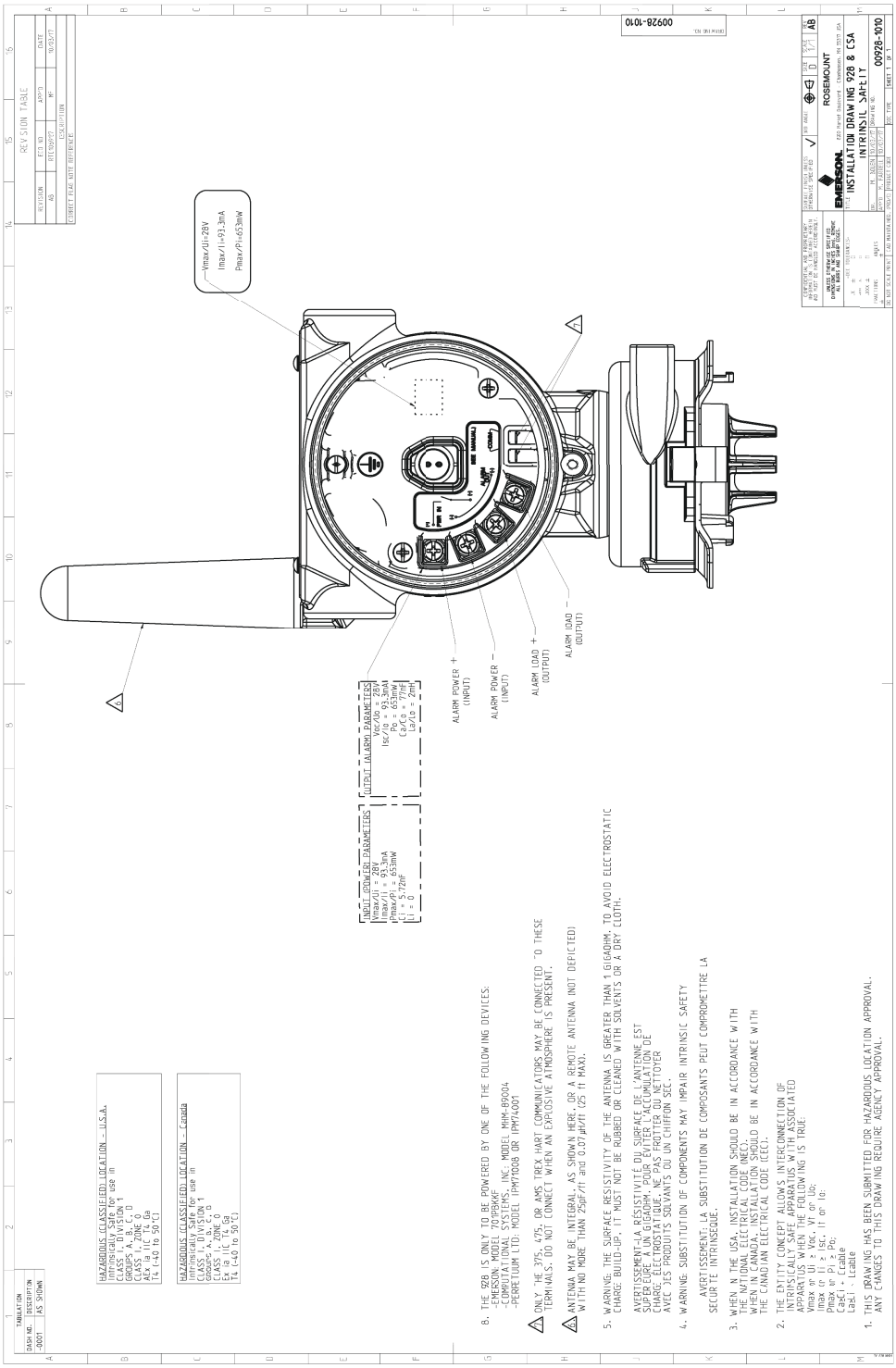
Certificate	UL-BR 19.0096X
Standards	ABNT NBR IEC 60079-0:2013, ABNT NBR IEC 60079-11:2013
Markings	Ex ia IIC T4 Ga; T4 (-40 °C ≤ Ta ≤ +50 °C)

Special Conditions for Safe Use (X):

See certificate.

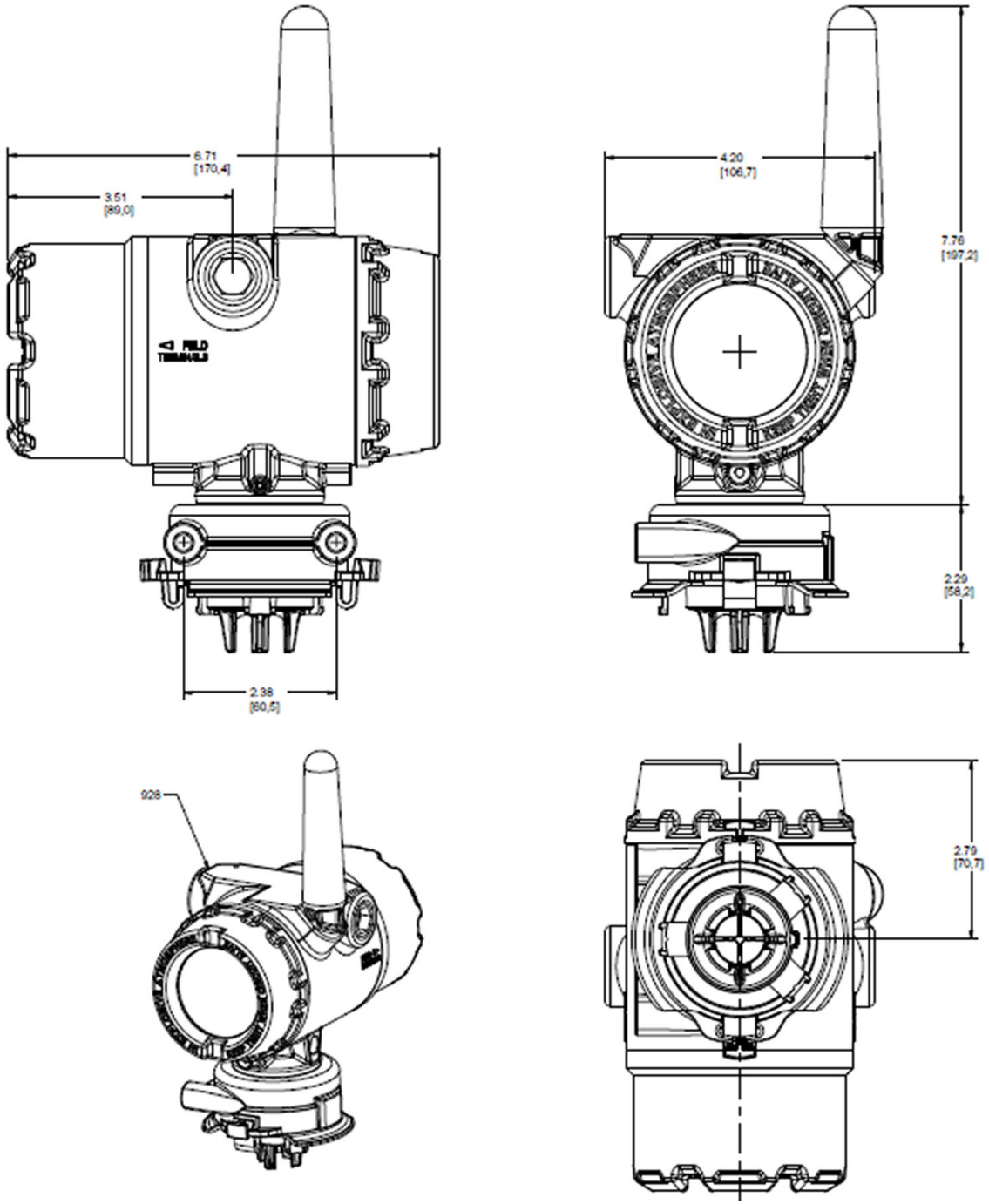
Intrinsically Safe installation drawing

Figure 1: Rosemount 928 Wireless Gas Monitor Intrinisically Safe Installation Drawing



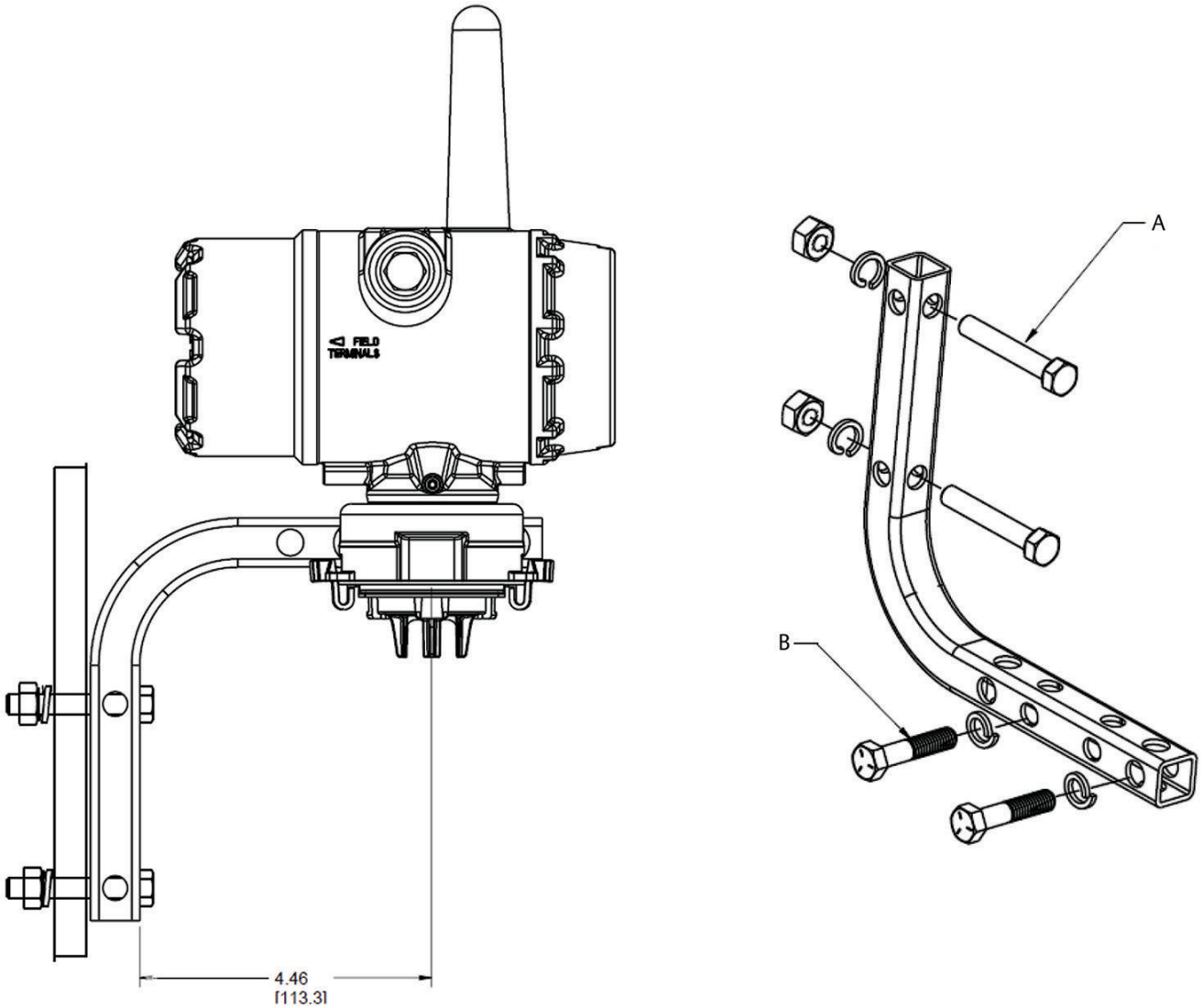
Dimensional drawings

Figure 2: Rosemount 928



Dimensions are in inches [millimeters].

Figure 3: Rosemount 928 Mounting Configurations



Dimensions are in inches [millimeters].

A. 2-in. bolt for pipe mounting (clamp shown)
B. ¼-in. x ¼-in. bolts for transmitter mounting

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

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