

Rosemount™ CX2100 In-Situ Oxygen Analyzer



Overview

The Rosemount CX2100 In-Situ Oxygen Analyzer provides a continuous, accurate measurement of the excess oxygen in flue gases coming from any combustion process.

Accurate measurements of excess oxygen from furnace exhaust are critical for combustion optimization; accuracy leads to reduced energy costs, increased safety, and lower emissions. The analyzer's robust oxygen sensor and autocalibration capabilities can reduce overall downtime and maintenance.

The Rosemount CX2100 is:

- A HART® Revision 7 device
- NAMUR NE-43 compliant

Repairable design for increased product lifetime

- The robust design of Rosemount's oxygen cells allows for longer lifetimes in a variety of applications. The cells can also be easily replaced.
- A range of diffuser assemblies allows for a longer lifetime of the analyzer in a wide range of process conditions. The assemblies can also be easily replaced as needed.

Design features allow for easier maintenance and promote safety

- The Rosemount CX2100 is available as a remote electronics configuration to allow personnel to access the analyzer while staying off the process.
- Quick connect design allows for easier probe maintenance and minimizes down time.
- The flame safety interlock feature promotes safety by powering down the heater in case of a flame out.
- Autocalibration and autocalibration check features using the Rosemount SPS 4001B allow for automatic data collection without operator intervention.

Contents

Overview..... 2

Ordering information..... 3


Specifications..... 6

Explosion-proof transmitter design

The Rosemount CX2100TR Remote Electronics comes in a rugged, explosion-proof design that satisfies ATEX/IECEX Ex db and CSA Class I, Division/Zone 1 requirements.

- The new Rosemount CX2100 In-Situ Oxygen Analyzer local operator interface (LOI) allows for easy menu navigation and can be translated into seven different languages.
- The Rosemount CX2100 In-Situ Oxygen Analyzer LOI can rotate 360° in 90° increments through software selections to best suit operator's needs.

Four capacitive touch buttons allow for local operation when removing transmitter housing cover.

Order code	Markings for Rosemount CX2100 In-Situ Oxygen Analyzer	Standards ⁽¹⁾	Agency
E1 (ATEX)	 II 2 G Ex db IIB+H2 T6 Gb -40 °C ≤ T _a ≤ +65 °C	EN IEC 60079-0: 2018 EN 60079-1: 2014	CSA
E7 (IECEX)	Ex db IIB +H2 T6 Gb -40 °C ≤ T _a ≤ +65 °C	EN IEC 60079-0: 2018 EN 60079-1: 2014	CSA
E5 & E6 (USA/ Canada)	Class 1, Zone 1 Ex db IIB+H2 T6 Gb Class 1, Zone 1 AEx db IIB+H2 T6 Gb Class 1, Div 1, Gp B, C, D, T6 -40 °C ≤ T _a ≤ +65 °C	60079-0 ⁽¹⁾ 60079-1 ⁽¹⁾ FM3600, FM3615 UL60079-0, UL60079-1 CSA C22.2 No. 30: 20	CSA

(1) Standards will be to latest revisions.

Ordering information

Required model components

Model

Code	Description
CX2100-AR	CX2100 In-Situ Oxygen Transmitter

Architecture

Code	Description
PI	Integral quick connect electronics probe
DR	Direct replacement probe with quick connect junction box only
TR	Remote electronics only with junction box

Probe length

Code	Description
NA	No selection
18	18-in. (0.46 m)
03	3-foot (0.91 m)
06	6-foot (1.8 m)

Probe flange type

Code	Description
NA	No selection
A2	ANSI 2-inch Class 150
A3	ANSI 3-inch Class 150
D6	DN65 PN10
D1	DN200 PN06

Diffuser

Code	Description
NA	No selection
01	316 stainless steel (SST) snubber diffusers (maximum temperature +750 °F [+400 °C])
02	Alloy C-276 diffusers (maximum temperature +1300 °F [+704 °C])
03	Alloy C-276 diffuser with vee deflector (maximum temperature +1300 °F [+704 °C])
04	Ceramic diffuser
05	Ceramic diffuser with vee deflector
06	Snubber with dust seal
07	Alloy C-276 diffuser with dust seal
08	Ceramic diffuser with dust seal

Probe installation weld plate

Code	Description
WP	New installation weld plate
NA	No additional probe mounting hardware
A3	Adapter plate to existing 3-inch 150# flange
A4	Adapter plate to existing 4-inch 150# flange
A6	Adapter plate to existing 6-inch 150# flange
B3	Adapter plate to existing 3-inch 300# flange
B4	Adapter plate to existing 4-inch 300# flange

Cell type

Code	Description
NA	No selection
01	Standard
02	Acid-resistant

Transmitter/box housing/threads configuration

Code	Description
1A	Aluminum ½-14 NPT

Code	Description
1B	Aluminum M20 x 1.5

Product certifications

Code	Description
NA	Not applicable
E1 ⁽¹⁾	ATEX
E5 ⁽¹⁾	US explosion-proof
E6 ⁽¹⁾	Canada explosion-proof
E7 ⁽¹⁾	IECEX
KB ⁽¹⁾	US and Canada explosion-proof (E5 and E6)

(1) Only available with the Rosemount CX2100TR

Optional selections

Advanced features

Code	Description
DA2	Advanced features

Probe accessories

Code	Description
AS	Abrasive shield accessory (includes mounting hardware)

Transmitter mounting options

Code	Description
B4	2-inch pipe/wall mount kit

No cable glands

Code	Description
NG	No cable glands

7-conductor shielded remote cable

Code	Description
C01	20 ft. (6.1 m)
C02	60 ft. (18.3 m)
C03	100 ft. (30.5 m)
C04	200 ft. (61 m)
C05	300 ft. (91.4 m)

Calibration certification

Code	Description
Q4	Calibration certification

Material traceability certification

Code	Description
Q8	Material traceability certification per EN 10204 3.1

Positive material identification

Code	Description
Q76	Positive material identification requested

Stainless steel (SST) tagging

Code	Description
Y2	316 SST wire-on tag

Specifications

Performance specifications

Table 1: Performance specifications

Specification	Value
Factory-calibrated O ₂ range	0-10%
User-configurable O ₂ range	Lower range limit (LRL) O ₂ : 0-10% Upper range limit (URL) O ₂ : 0-50%
Repeatability	±0.75% of reading or 0.05% of O ₂ , whichever is greater from 0-10% 1% of reading above 10% For temperatures up to +1300 °F (+704 °C)
Lowest detection limit	0.02% O ₂
Repeatability of stoichiometric advanced feature	±0.2% from an O ₂ deficiency of 0 to 2%

Table 2: Instrument Recommendations

Specification	Value
Calibration gases	Low: 0.4% to 2% O ₂ , balance nitrogen High: 8% to 21% O ₂ , balance nitrogen Calibration gases should reflect critical operating O ₂ range. Regulate to 20 psi (1.4 bar), 5 scfh
Reference air	Instrument air (clean, dry) Regulate to 20 psi, 2 scfh

Table 3: Measurement Drift

O ₂ concentration	0.4%	8%	20%	
Measurement drift maximum	±0.05	±0.1	±0.25	% O ₂ per month

Calibration modes

Additional devices	Initiation	Gas sequencing
None	Local operator interface (LOI), distributed control system (DCS), or communication device	Manually
Rosemount SPS 4001B	Manually, timer, or contact relay	Automated

Gas port size ¼ in. (6 mm)

Autocalibration with the Rosemount SPS 4001B

The SPS 4001B is a calibration system which conveniently sequences calibration gases without any labor from an operator or maintenance technician.

Calibration flow meter(s) and reference air flow meter(s)/regulator(s) are included with the autocalibration manifold. You can initiate the calibration using a contact relay or timer. You can also set the calibration to initiate automatically using the analyzer's calibration recommended diagnostic. The autocalibration can also be initiated manually from the local operator interface (LOI). Emerson has designed the SPS 4001B to automatically calibrate one oxygen analyzer. The SPS 4001B is compatible with a Rosemount CX2100PI Integral Analyzer or a CX2100TR Remote Transmitter.

- Complete autocalibration assembly includes calibration flow meter and reference air flow meter/regulator and solenoids mounted on a single manifold.
- Automatic calibrations reduce operator time to ensure continuously accurate readings.
- Order using part number: XSO2CAL-01.

Functional specifications

Temperature limits

Table 4: Probe, Diffuser, and Accessory Temperature Limits

Unit	Process
Standard probe	-40 to +1300 °F (-40 to +704 °C)
Wall flange seal	-40 to +392 °F (-40 to +200 °C)
Stainless steel snubber diffuser	Up to 750 °F (+400 °C)
Ceramic diffuser	Up to +1300 °F (+704 °C)
Alloy C-276 diffuser	Up to +1300 °F (+704 °C)
Bypass accessory	Up to +2000 °F (+1093 °C)
Abrasive shield accessory	Up to +1300 °F (+704 °C)
Extended temperature control (part of Advanced Features option, DA2)	-40 to +1562 °F (-40 to +850 °C)

Table 5: Ambient Temperature Limits

No damage will be done to the display, but readability could be compromised at lower temperatures.

Configuration	Product operation	LCD display operation
Direct replacement probe (CX2100DR)	-40 to +194 °F (-40 to +90 °C)	N/A
Remote electronics (CS2100TR)	-40 to +149 °F (-40 to +65 °C)	-4 to +149 °F (-20 to +65 °C)
Integral electronics probe (CX2100PI)	-40 to +149 °F (-40 to +65 °C)	-4 to +149 °F (-20 to +65 °C)

Table 6: Storage Temperature Limits

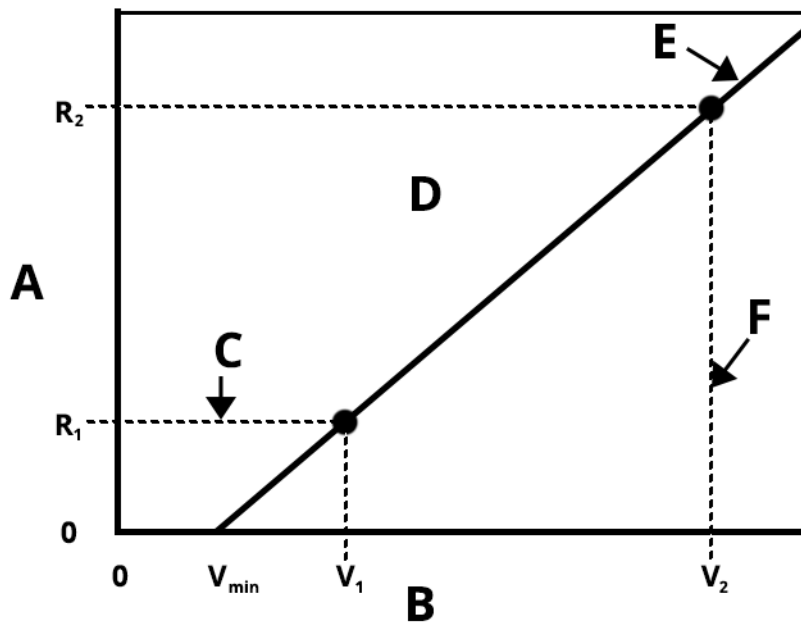
Configuration	Temperature range
Direct Replacement Probe	-40 to +194 °F (-40 to +90 °C)
Electronics	-40 to +185 °F (-40 to +85 °C)
Electronics probe	-40 to +185 °F (-40 to +85 °C)

Electrical specifications

Rosemount CX2100 power requirements and consumption

- Power** 270 VA
- Frequency** 50/60 Hz
- Input voltage** 95 - 240 ±10% Vac
- Fuse current** 2 A slo-blow, non-replaceable

Input/output options



- A. Loop resistance (Ω)
- B. Supply voltage (V)
- C. Minimum load for communications
- D. Operating region
- E. Load limit line
- F. Maximum voltage

Table 7: Load Resistance and Voltage Supply Limits for Externally Powered

Measurement type	Measurement limit
R_1 (Ω)	250
R_2 (Ω)	1061
V_{\min} (V)	4.25
V_1 (V)	9.9
V_2 (V)	30

Table 8: Load Resistance for Internally Powered

Measurement type	Measurement limit
R_{Max}	820
V_{nom} (V)	24

Table 9: CX2100 input/output options

Channel	Input/output options
A	mA output
B	Relay or Autocalibration (choose one)
C	Relay or Flame Safety Interlock (choose one)

- Normally open when unpowered
- Relay contact capacity: 30V 1A

Table 10: mA Output Ranges

Minimum span is 1 percent.

mA output type	Normal	Extended stoichiometer
Lower range value (LRV)	0 to 49% O ₂	-2 to 49% O ₂
Upper range value (URV)	1 to 50% O ₂	0 to 50% O ₂

Physical specifications

- Process wetted parts** 316L or 304 stainless steel
- Orientation** Vertical down or horizontal
- Electrical conduit size** ½ - 14 NPT or M20 options

Table 11: Shipping Weights

Rosemount CX2100TR: 5 lb. (2.27 kg)

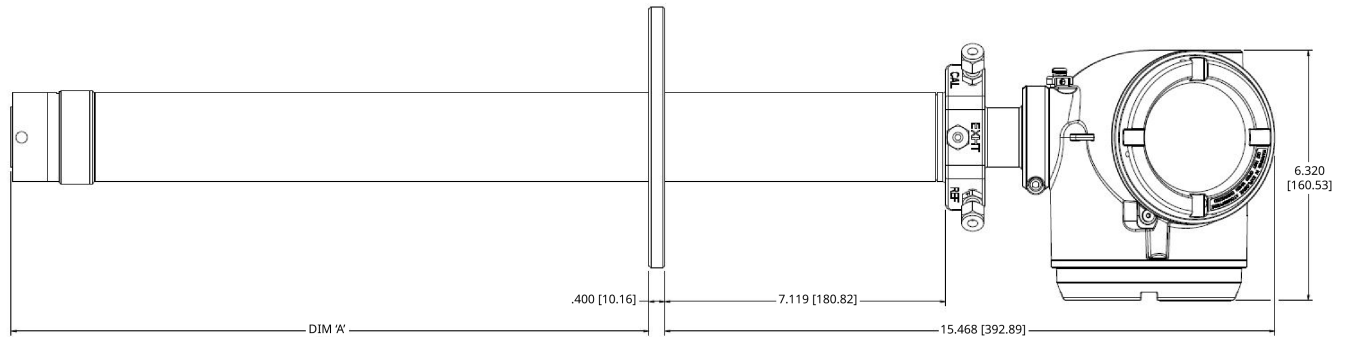
Length	CX2100 Direct Replacement (DR) Probe	CX2100 Integral Probe (PI)
18 in. (457 mm)	17.13 lb. (7.77 kg)	19.33 lb. (8.77 kg)
3 ft. (0.91 m)	19.33 lb. (8.77 kg)	21.54 lb. (9.77 kg)
6 ft. (1.83 m)	23.74 lb. (10.77 kg)	25.95 lb. (11.77 kg)

Table 12: Clamp Screw Specifications

Screw material	Torque	Property class	Screw thread
Stainless steel	31 ±1 in-lb	A4-70 SHCS	M5 x 0.8

Dimensions

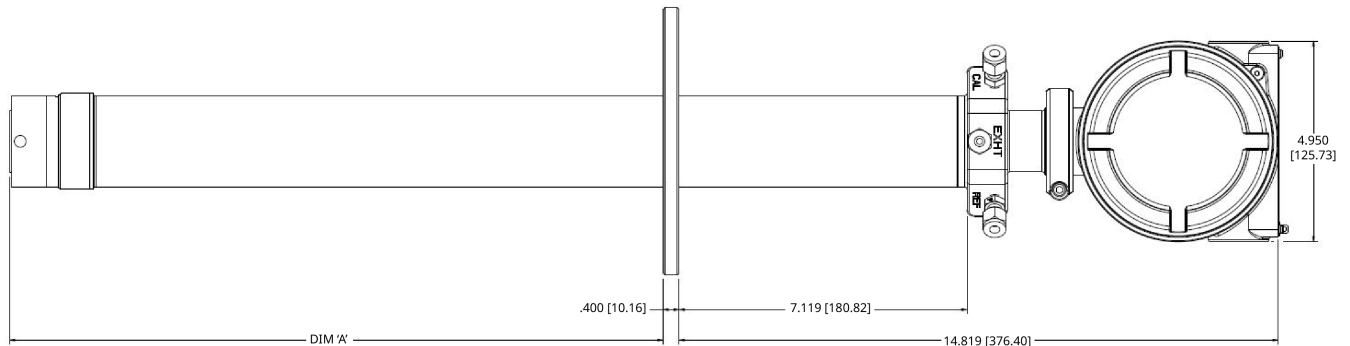
Figure 1: Rosemount CX2100PI Integral Analyzer with Ordinary Locations Approved Snubber Diffuser



Note

Dimensions are in inches [millimeters].

Figure 2: CX2100 Direct Replacement (DR) Probe with Ordinary Locations Approved Snubber Diffuser



Note

Dimensions are in inches [millimeters].

Table 13: Removal/Installation Dimensions for Probes with Snubber Diffusers

Dimension A in [Figure 1](#) and [Figure 2](#)

Probe length	No hazardous locations certifications	
	Insertion depth with snubber diffuser	Insertion depth with dust seal snubber diffuser
18 in. (457 mm)	15.826 in. (402 mm)	16.3 in. (414 mm)
3 ft. (0.91 m)	33.826 in. (859 mm)	34.3 in. (871 mm)
6 ft. (1.83 m)	69.826 in. (1774 mm)	70.3 in. (1786 mm)

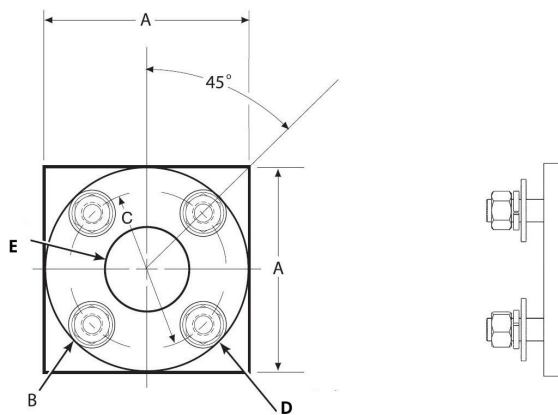
Table 14: Removal/Installation Dimensions for Probes with Alloy C-276 Diffusers

Probe length	No hazardous locations certifications		
	Insertion depth with alloy C-276 diffuser	Insertion depth with alloy C-276 diffuser and vee-deflector	Insertion depth with dust seal alloy C-276 diffuser
18 in. (457 mm)	18.396 in. (467 mm)	19.536 in. (496 mm)	18.19 in. (462 mm)
3 ft. (0.91 m)	36.396 in. (924 mm)	37.536 in. (953 mm)	39.19 in. (995 mm)
6 ft. (1.83 m)	72.396 in. (1839 mm)	73.536 in. (1868 mm)	72.19 in. (1834 mm)

Table 15: Removal/Installation Dimensions for Probes with Ceramic Diffusers

Probe length	No hazardous locations certifications		
	Insertion depth with ceramic diffuser	Insertion depth with ceramic diffuser and vee-deflector	Insertion depth with dust seal ceramic diffuser
18 in. (157 mm)	19.356 in. (492 mm)	19.536 in. (496 mm)	19.80 in. (502.9 mm)
3 ft. (0.91 m)	37.356 in. (949 mm)	37.536 in. (953 mm)	37.80 in. (960.1 mm)
6 ft. (1.83 m)	73.356 in. (1863 mm)	73.536 in. (1868 mm)	73.80 in. (1874.5 mm)

Figure 3: Probe Installation Square Weld Plates



- A. Square weld plate length (see [Table 16](#))
- B. Thread size (see [Table 16](#))
- C. Bolt circle diameter (see [Table 16](#))
- D. Four studs, lockwashers, and nuts equally spaced on C, diameter BC
- E. Inner dimension (see [Table 16](#))

Table 16: Installation Square Weld Plate Dimensions

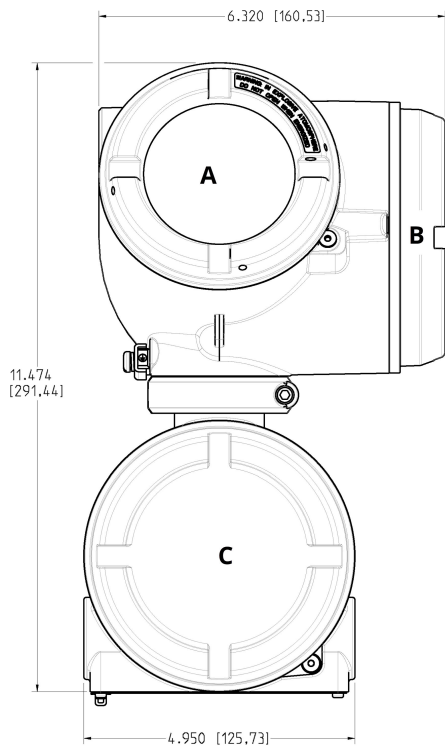
Weld plate thickness is 0.5 in. (13 mm) for all weld plate types.

	ANSI 2-inch Class 150	ANSI 3-inch Class 150	DIN65 PN10	DIN100 PN06
A (square weld plate length)	6 in. (152 mm)	7.75 in. (197 mm)	7.5 in. (191 mm)	8.46 in. (215 mm)
B (thread size)	3/8-11 unified national thread (UNC) - 2B	3/8-11 UNC	M16 x 2.0	M16 x 2.0 - 6H
C (bolt hole diameter)	4.75 in. (121 mm)	6 in. (152 mm)	5.71 in. (145 mm)	6.69 in. (170 mm)
E (inner dimension)	2.5 in. (64 mm)	3.25 in. (83 mm)	2.5 in. (64 mm)	3.25 in. (83 mm)

Table 17: Mounting Flange Dimensions

	ANSI 2-inch Class 150	ANSI 3-inch Class 150	DIN65 PN10	DIN100 PN06
Outer diameter	6.6 in. (168 mm)	7.5 in. (191 mm)	7.28 in. (185 mm)	8.3 in. (211 mm)
Bolt circle diameter	4.75 in. (121 mm)	6 in. (152 mm)	5.71 in. (145 mm)	6.7 in. (170 mm)
Bolt hole diameter	0.75 in. (19 mm)	0.75 in. (19 mm)	0.71 in. (18 mm)	0.71 in. (18 mm)

Figure 4: Remote Electronics Transmitter

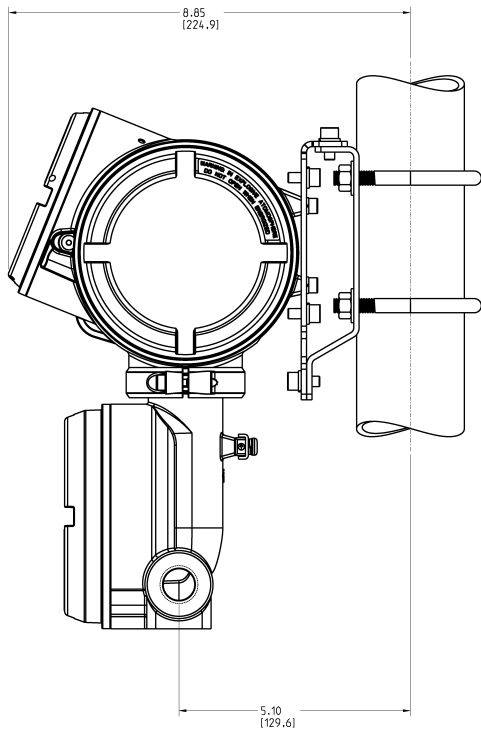


- A. Local operator interface (LOI) cover
- B. Blind transmitter cover
- C. Blind junction box cover

Note

Dimensions are in inches [millimeters].

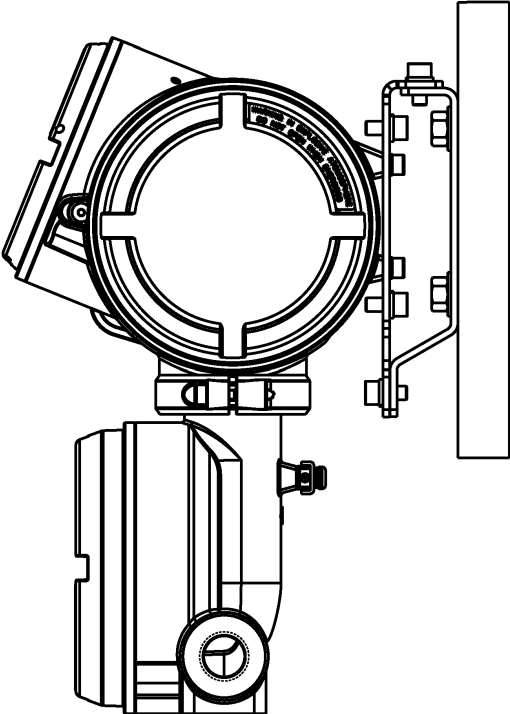
Figure 5: Remote Electronics Transmitter Mounted on Pole



Note

Dimensions are in inches [millimeters].

Figure 6: Remote Electronics Transmitter Mounted on Wall



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

©2025 Emerson. All rights reserved.

Emerson Terms and Conditions of Sale are available upon request. The Emerson logo is a trademark and service mark of Emerson Electric Co. Rosemount is a mark of one of the Emerson family of companies. All other marks are the property of their respective owners.

ROSEMOUNT™

