Quick Start Guide
MS-00825-0100-9740, Rev AC
July 2025

Rosemount™ CX2100 In-Situ Oxygen Analyzer

ROSEMOUNT™

EMERSON

Safety messages

⚠ WARNING

Follow installation guidelines

Failure to follow these installation guidelines could result in death or serious injury. If the equipment is used in a manner not specified by the manufacturer, the protection it provides against hazards may be impaired.

- Follow all warnings, cautions, and instructions marked on and supplied with the product.
- Ensure only qualified personnel perform the installation, operation, and maintenance of the product.
- Inform and educate your personnel in the proper installation, operation, and maintenance of the product.
- Follow appropriate local and national codes.
- If you do not understand any of the instructions, contact your local Emerson representative for clarification.

⚠ WARNING

Explosions

Do not open when an explosive atmosphere may be present.

⚠ WARNING

Electrical shock

Failure to install covers and ground leads could result in serious injury or death.

- Do not open the junction box cover or display cover while energized.
- Install all protective covers, clamps, and ground leads after installation.
- Ensure that power terminals are covered by a plastic door and HART® terminals are accessible.

⚠ WARNING

Connect all devices to the proper electrical and pressure sources.

⚠ WARNING

Physical access

Unauthorized personnel may potentially cause significant damage to and/or misconfiguration of end users' equipment. This could be intentional or unintentional and needs to be protected against.

Physical security is an important part of any security program and fundamental in protecting your system. Restrict physical access by unauthorized personnel to protect end users' assets. This is true for all systems used within the facility.

⚠ CAUTION

For Rosemount CX2100TR Remote Electronics Transmitter, only use cables and certified cable glands rated ≥ 185 °F (85 °C).

⚠ CAUTION

Tampering or unauthorized substitution of parts and procedures can affect the performance and cause unsafe operation of your process

Use only factory documented components for repair.

1 Specifications required for approvals

Maximum altitude	9842 ft. (3000 m)
Over voltage category	II
Pollution degree	4
Relative humidity	5 to 95 percent non-condensing
Supply voltage	85 - 250 Vac

Table 1-1: Probe, Diffuser, and Accessory Temperature Limits

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

Table 1-2: Ambient Temperature Limits

	Product operation	LCD display operation
Remote mount probe	-40 to +194 °F (-40 to +90 °C)	N/A
Remote mount transmitter	-40 to +149 °F (-40 to +65 °C)	-4 to +149 °F (-20 to +65 °C)
Integral mount probe	-40 to +149 °F (-40 to +65 °C)	-4 to +149 °F (-20 to +65 °C)

2 Installation

2.1 Mechanical installation

Most combustion processes run only slightly negative or positive in pressure, so that the probe flange is for mechanical mounting only.

The probe is not rated for high pressures. If this is a new installation, Emerson can supply a weld plate for welding to the flat flue gas duct surfaces.

2.1.1 Install Rosemount CX2100-PI Integral Probe or CX2100-DR Direct Replacement Probe

Prerequisites

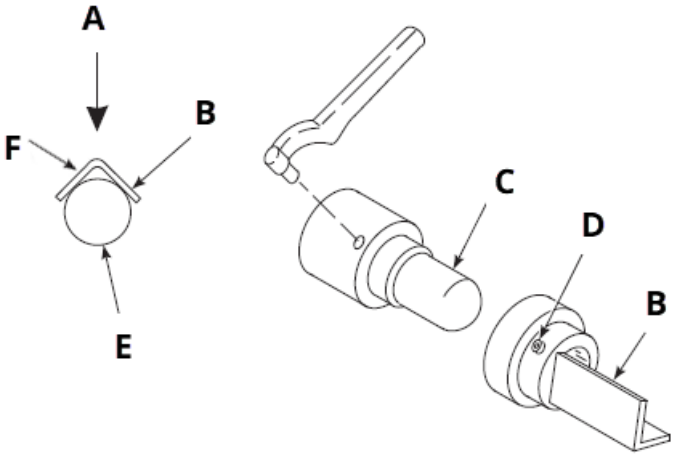
Ensure all components are available to install the probe.

Procedure

1. If using a diffusion element with a vee-deflector, the vee-deflector must be correctly oriented. Before inserting the probe, check the direction of the gas flow in the duct. Orient the vee-deflector so the apex points upstream towards the flow.

   See Figure 2-1.

Figure 2-1: Orienting Optional Vee Deflector



A. Gas flow direction
B. Vee deflector
C. Diffusion element
D. Set screw
E. Filter
F. Apex

a) Loosen the set screws.

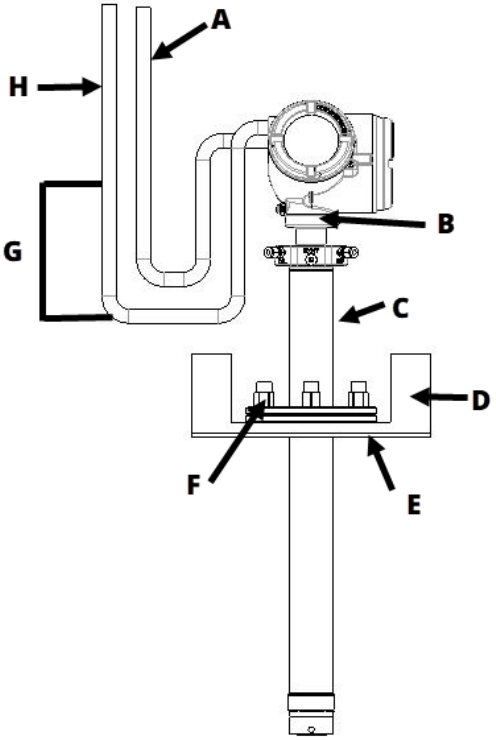
b) Rotate the vee-deflector to the desired position.

c) Retighten the set screws.

2. In vertical installations, ensure the system cable drops vertically from the analyzer and the conduit is routed below the level of the analyzer or junction box housing.

   This drip loop, shown in Figure 2-2, minimizes the possibility that moisture will damage the electronics.

Figure 2-2: Drip Loop and Insulation Removal



A. Logic input/output, 4-20 mA signal
B. Clamp screw
C. ***Note***
Replace insulation after installing analyzer.
D. Insulation
E. Stack or duct metal wall
F. Adapter plate
G. Drip loop
H. Line voltage

Note
CX2100PI Integral Analyzer is shown. You may orient the probe in any direction. Emerson does not recommend vertical up orientation due to the possibility of particulate settling on the cell.

3. If using the standard square weld plate, weld or bolt the plate onto the duct.

   The through hole diameter in the stack or duct wall and refractory material must be at least 2.5 in. (63.5 mm).

4. If the system has an abrasive shield with a dust seal, check the dust seal gaskets. Make sure the joints in the two gaskets are staggered 180 degrees and that the gaskets are in the hub grooves as the transmitter slides into the 15-degree forcing cone in the abrasive shield.

NOTICE

Emerson recommends an abrasive shield for abrasive particulates in the flue gas stream and for longer probes to provide support.

NOTICE

If process temperatures will exceed +392 °F (+200 °C), use anti-seize compound on the stud threads to ease future removal of the analyzer. Refer to the conditions for safe use in the Product certifications section of the *Quick Start Guide* for maximum flange temperature.

5. Insert the probe with a new gasket installed through the opening in the mounting flange and bolt the unit to the flange.

   Take care when inserting a probe with a dust seal. Push probe straight so as to not deform the seal between the O_2 cell and probe.

6. If installing a CX2100 PI Integral Probe, ensure the analyzer is properly earthed by way of both internal and external points.

NOTICE

Uninsulated stacks or ducts may cause ambient temperatures around the electronics to rise, which may cause overheating damage to the electronics.

If you removed duct work insulation for analyzer mounting, replace the insulation afterwards. Ensure the probe installation does not obscure the warnings on the housing covers.

7. If installing a CX2100PI Integral Electronics Probe, position the transmitter to the correct orientation for your process by loosening the clamp and clamp screw. Once the transmitter has been positioned in the correct orientation, tighten the clamp and clamp screw back onto the probe.

⚠ WARNING

The quick connect clamp is part of the enclosures.

To maintain the integrity of the enclosures for hazardous and ordinary locations approvals, the clamp must be installed with the clamp screw at the correct torque per Table 2-1.

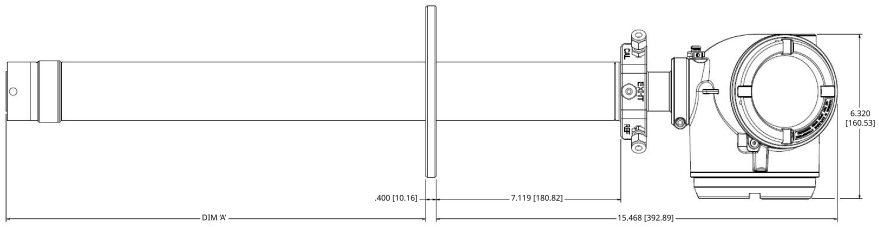
NOTICE

Do not twist the transmitter more than 180 degrees to protect cable assembly.

Table 2-1: Quick Connect Clamp screw specifications

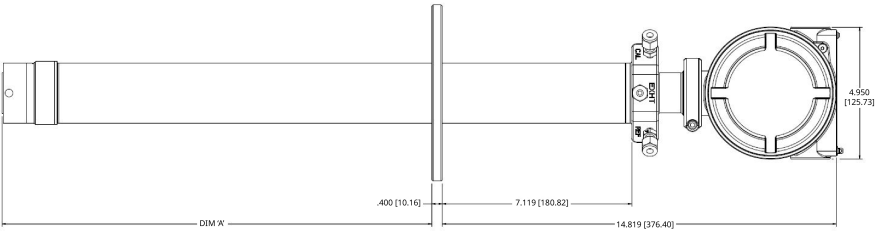
Screw material	Torque	Property class	Screw thread
Stainless steel	31 ± 1 in-lb	A4-70 SHCS	M5 x 0.8

Figure 2-3: CX2100-PI Integral Analyzer with Ordinary Locations Approved Snubber Diffuser



An integral probe consists of a transmitter directly attached to a probe body.

Figure 2-4: CX2100 DR Direct Replacement Probe with Ordinary Locations Approved Snubber Diffuser



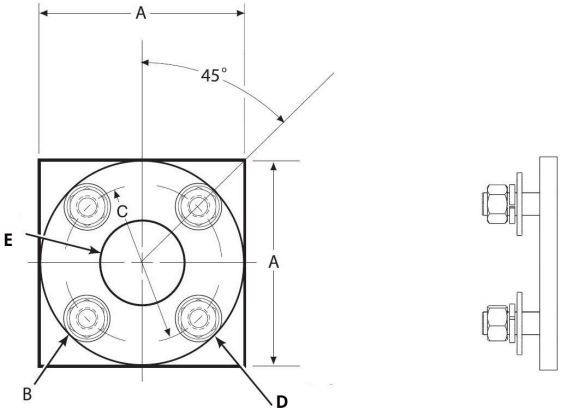
A direct replacement (DR) probe consists of a junction box directly attached to a probe body via a quick connect clamp.

Table 2-2: Removal/Installation Dimensions for Probes with Snubber Diffusers

Dimension A in Figure 2-3 and Figure 2-4

Probe length	No hazardous locations certifications
	Insertion depth with snubber diffuser
18 in. (0.457 m)	15.826 in. (0.402 m)
3 ft. (0.91 m)	33.826 in. (0.859 m)
6 ft. (1.83 m)	69.826 in. (1.774 m)

Figure 2-5: Probe installation square weld plates



A. Square weld plate length (see Table 2-3)
B. Thread size (see Table 2-3)
C. Bolt circle diameter (see Table 2-3)
D. Four studs, lockwashers, and nuts equally spaced on C, diameter BC
E. Inner dimension (see Table 2-3)

Table 2-3: Installation square weld plate dimensions

	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)	⅝-11 unified national thread (UNC) - 2B	⅝-11 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 2-4: Mounting flange dimensions

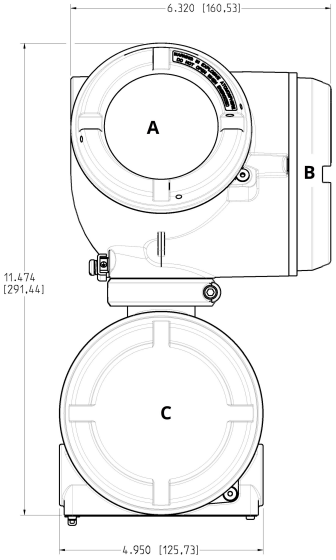
	ANSI 2-inch Class 150	ANSI 3-inch Class 150	DIN65 PN10	DIN100 PN06
Outer diameter	6.6 in. (168 mm)	7.5 in. (191 mm)	7.28 in. (185 mm)	8.3 in. (211 mm)

Table 2-4: Mounting flange dimensions *(continued)*

	ANSI 2-inch Class 150	ANSI 3-inch Class 150	DIN65 PN10	DIN100 PN06
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)

2.1.2 Install Rosemount CX2100 TR Remote Electronics

Figure 2-6: Remote Electronics Transmitter



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

Figure 2-7: CX2100 Remote Electronics Mounted on Pole

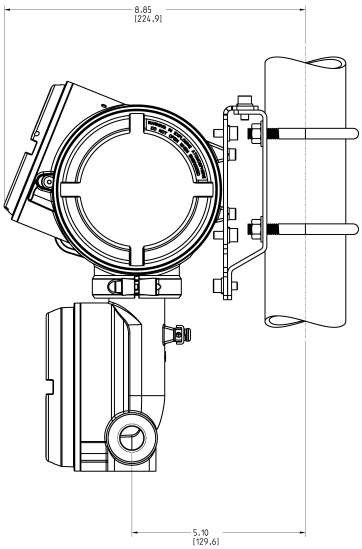
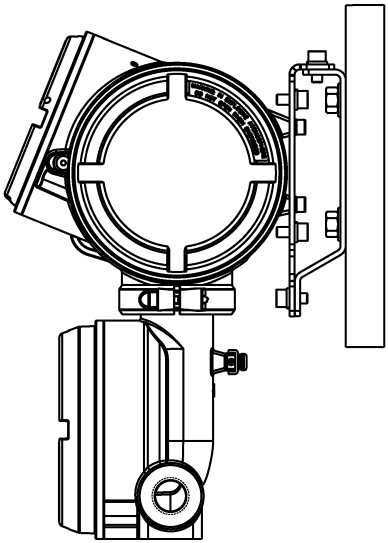


Figure 2-8: Remote electronics transmitter mounted on wall



Procedure

1. For a Rosemount CX2100 configuration with the remote electronics option, install the probe according to Install Rosemount CX2100-PI Integral Probe or CX2100-DR Direct Replacement Probe
2. Install the remote electronics unit using the mounting bracket kit on a wall, standpipe, or similar structure.

NOTICE

Use only bolts supplied with the electronics analyzer.

2.2 Electrical installation

All wiring must conform to local and national codes.

This section shows multiple wiring diagrams. Always refer to the diagrams that apply to your configuration and disregard all other wiring diagrams.

⚠ WARNING

Electrical shock

Failure to install covers, clamps, and ground leads could result in serious injury or death.

Disconnect and lock out power before wiring the AC terminals.
Install all protective covers and ground leads after installation.
To meet the safety requirements of CSA/IEC/UL 61010-1 and ensure safe operation of the equipment, connect the main electrical power supply through a circuit breaker (minimum 10 A) which will disconnect all current-carrying conductors during a fault situation. This circuit breaker should also include a mechanically operated isolating switch. If it does not, keep another external means of disconnecting the power supply from the equipment close by. Circuit breakers or switches must comply with a recognized standard, such as IEC 947.
To maintain proper earth grounding, ensure a positive connection exists between the analyzer housing and earth. The connecting ground wire must be 14 AWG minimum.

⚠ WARNING

To maintain Explosion-proof protection for hazardous area installations, all cable entry devices and conduit plugs for unused apertures must be certified Flameproof and suitable for the conditions of use. Make sure they are properly installed.

All unused conduit entries must be closed by a suitable conduit plug as to meet the requirements of the applicable codes and standards. Do not use a conduit plug with a thread adapter.

Install any threaded rigid metal conduit or cable glands per applicable codes and standards.

Figure 2-9 shows conduit entries. If conduit entries are not marked as M20, the entries are ½-in. NPT.

NOTICE

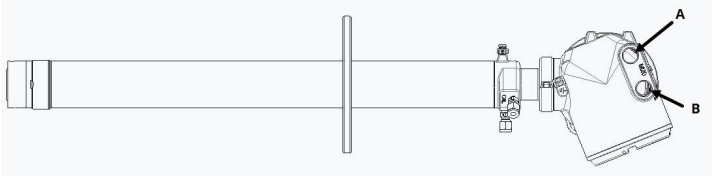
To maintain CE compliance, ensure a good connection exists between the mounting flange bolt and earth.

2.2.1 Wire Rosemount CX2100 Transmitter for integral or remote configuration

Procedure

1. Remove the terminal transmitter cover from the transmitter.
2. Use the conduit entries shown in Figure 2-9 to route the line power and Channel A/B/C cables into the analyzer housing.

Figure 2-9: Conduit Entries for CX2100 Integral Probe

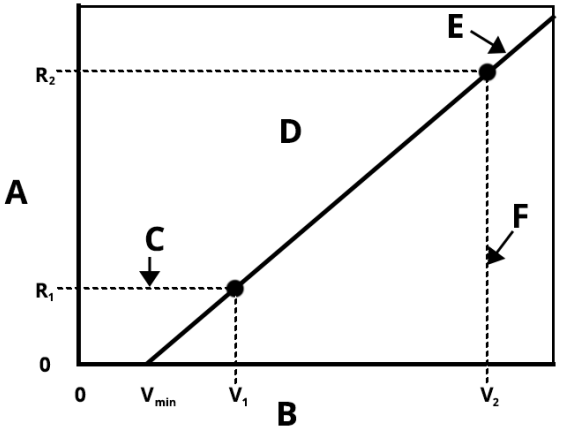


A. To channel A, B, and C signal lines
B. To power

3. Connect the line power (`L1` wire) to the `L1 Line Power` terminal, the neutral (`L2` wire) to the `L2/N` terminal, and the ground wire to the ground lug.

The analyzer accepts line voltage between 85 and 250 Vac. No setup is required. See Figure 2-11.

Figure 2-10: CX2100 Loop Resistance and Supply Voltage



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

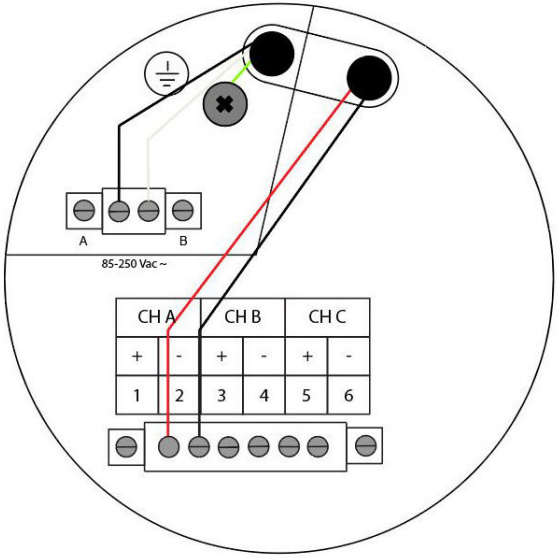
Table 2-5: Load Resistance and Voltage Supply Limits for Externally Powered Analyzer

$R_1(\Omega)$	250
$R_2(\Omega)$	1061
V_{min} (V)	4.25
V_1(V)	9.88
V_2(V)	30

Table 2-6: Load Resistance for Internally Powered Analyzers

$R_{max}(\Omega)$	820
V_{nom}(V)	24

Figure 2-11: Wiring for CX2100 Transmitter - Power and Channel A 4-20 mA



A. `L1`: *Line power*
B. `L2`: *Neutral power*

Table 2-7: Input/Output Options

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

Table 2-8: CX2100 Power Requirements and Consumption

Analyzer input voltage and frequency	85-250 Vac, 50/60 Hz
Analyzer heater maximum output power	250 Watts
Remote probe input maximum voltage	250 Vac
Remote probe input power	200 Watts at 115 V

Table 2-9: Conductor Sizing and Wire Gauge for CX2100 Transmitter

	Conductor sizing	Wire gauge
Line/Neutral/Earth	1.5 - 2.5 mm^2	16-12 AWG
Channel A/Channel B/Channel C	0.25 - 2.5 mm^2	24-12 AWG

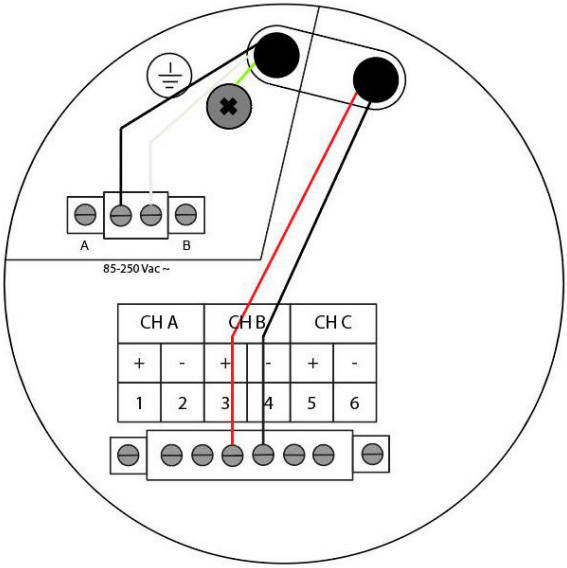
4. Connect the analog output wires at the **Channel A** terminals according to Figure 2-11.

   The transmitter electronics analog output can be either active or passive (meaning an internal or external power supply).

   4-20 mA signal The 4-20 mA signal represents the O_2 value. Superimposed on the 4-20 mA signal is HART® information that is accessible through a communication device or AMS software.

5. Connect optional `Autocalibration` or `Relay Output` leads to **Channel B** as shown in Figure 2-12.

Figure 2-12: Wiring for CX2100 Transmitter - Channel B Rosemount SPS 4001B or Relay



A. `L1`: Line power

B. `L2`: Neutral power

If **Channel B** is configured to `Relay`, you can use the output signal to trigger an alarm.

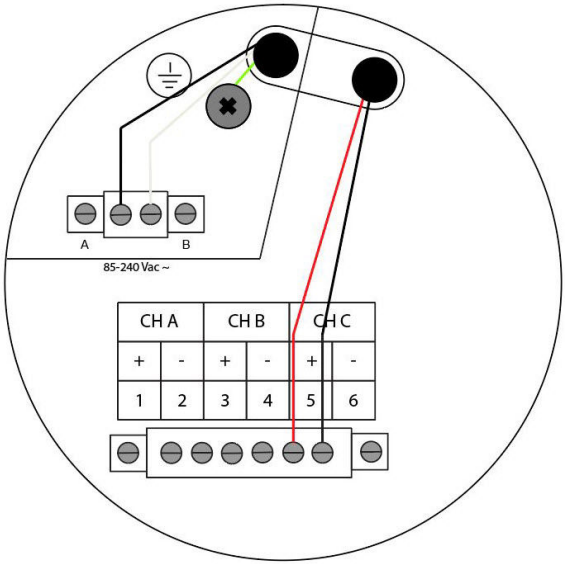
The **Channel B** output signal can provide a calibration handshake signal to a Rosemount SPS 4001B Autocalibration System. Refer to the Rosemount SPS 4001B Manual for maintaining SPS wiring details.

⚠ WARNING

If using an SPS 4001B, install it in a non-hazardous, explosive-free environment.

6. Connect optional `Flame Safety Interlock` or `Relay Output` leads to **Channel C** as shown in Figure 2-13.

Figure 2-13: Wiring for CX2100 Transmitter - Channel C Flame Safety Interlock or Relay



A. `L1`: Line power

B. `L2`: Neutral power

If **Channel C** is configured to `Relay`, you can use the output signal to trigger an alarm.

If **Channel C** is configured to `Flame Safety Interlock`, **Channel C** will accept a discrete input from a dry contact relay.

7. Reinstall cover on transmitter.

Note
For NEMA® 4X, IP66, and IP88 requirements, use thread sealing PTFE tape or paste on male threads of conduit to provide a water and dust tight seal. Always ensure a proper seal by installing the electronics housing cover(s) so that metal contacts metal. Use Rosemount O-rings.

8. Plug and seal unused conduit connections on the transmitter housing to avoid moisture accumulation on the terminal side.

Related information

Product certifications

2.2.2 Install cover jam screw

For transmitter housings shipped with a cover jam screw, install the screw after wiring and powering up the transmitter.

Proper installation and use of the cover jam screw is required to maintain hazardous location approvals.

Procedure

1. Verify the cover jam screw is completely threaded into the housing.
2. Install the transmitter housing cover and verify that the cover is tight against the housing.
3. Using an M4 hex wrench, loosen the jam screw until it contacts the transmitter cover.
4. Turn the jam screw an additional ½ turn counterclockwise to secure the cover.

NOTICE

Applying excessive torque may strip the threads.

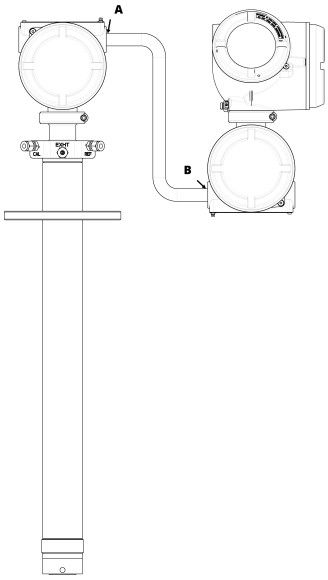
5. Verify the cover cannot be removed.

2.2.3 Wire Rosemount CX2100 junction boxes for remote configuration

The remote electronics junction box is located on the CX2100TR Remote Electronics Transmitter.

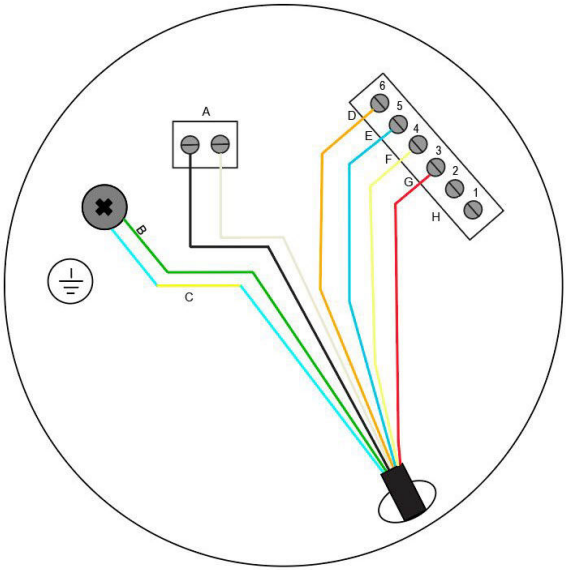
When installing a CX2100 remote configuration consisting of a CX2100 Direct Replacement (DR) Probe and CX2100TR Remote Electronics Transmitter, a multi-conductor power/signal cable connects the probe to the remote electronics transmitter as shown in Figure 2-14.

Figure 2-14: CX2100 Remote Electronics Configuration



A. DR probe junction box conduit entries
B. Remote electronics junction box conduit entry

Figure 2-15: Junction Box Wiring



A. *Heater (HTR)*
B. *Safety ground*
C. *Shields (transmitter wiring only)*
D. *Oxygen (O_2+)*
E. *O_2-*
F. *Thermocouple (TC+)*
G. *TC–*
H. *RTD*

Procedure

1. Remove the cover from the junction box.
2. You can use either of the two conduit entries to route the cable into the junction box housing.
3. Connect the heater power lines to the two HTR terminals.
4. Connect the O_2 signal lines to the O2– and O2+ terminals.
5. Connect the thermocouple (TC) lines to the TC– and TC+ terminals.
6. Connect the safety ground wire to the ground lug.
7. If wiring the transmitter junction box, terminate the shield at the transmitter junction box housing.

8. Reinstall cover on junction box.
9. For NEMA® 4X, IP66, and IP68 requirements, use thread sealing PTFE tape or paste on male threads of conduit to provide a water and dust tight seal. Always ensure a proper seal by installing the electronics housing cover(s) so that metal contacts metal. Use Rosemount O-rings.
10. Plug and seal unused conduit connections on the transmitter housing to avoid moisture accumulation on the terminal side.

2.3 Pneumatic installation

2.3.1 Calibration gas

Emerson recommends the following calibration gas concentrations for typical applications operating below 10 percent O_2:

- Low gas (0.4 percent O_2, balance N_2)
- High gas (8.0 percent O_2, balance N_2)

For higher O_2 applications, like winbox O_2, Emerson recommends:

- Low gas (0.4 percent to 2 percent O_2, balance N_2)

  Note
  Emerson recommends using a low gas value that spans the application's range of measurement and that has a minimum delta of 4 percent O_2 from the high gas value.

- High gas (21 percent O_2, balance N_2 or dry bottle air)

Refer to the *Rosemount CX2100 Product Data Sheet* for calibration gas performance specifications.

NOTICE

Failure to use proper gases will result in erroneous readings.

Do not use 100 percent nitrogen as a low gas (zero gas). Emerson recommends using between 0.4 percent and 2.0 percent O_2 for the zero gas. Do not use gases with hydrocarbon concentrations of more than 40 parts per million.

NOTICE

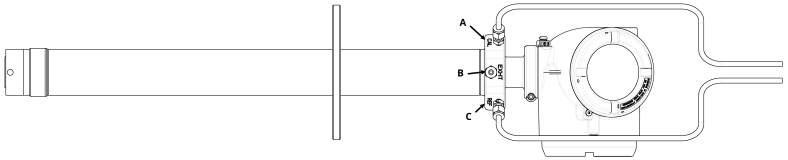
Before washing down the ducts, verify that the analyzers have been powered down and removed from the wash areas.

NOTICE

Damage can result from having a cold analyzer exposed to process gases.

Upon completing installation, ensure that the analyzer is turned on and operating before firing up the combustion process. During outages, if possible, leave all analyzers running to prevent condensation and premature aging from thermal cycling.

Figure 2-16: Calibration Gas Connections



A. `CAL` *is calibration gas in*
B. `EXHT` *is reference air vent*
C. `REF` *is reference air in*

Reference air components are included in the optional manual calibration panel and the Rosemount SPS 4001B Single Probe Autocalibration Sequencer.

NOTICE

The optional SPS 4001B Sequencer can be used with the CX2100, 6888, and Oxymitter oxygen analyzers. Ensure the analyzers are configured for autocalibration when using the SPS 4001 B Sequencer.

See the Rosemount SPS 4001B Reference Manual for wiring and pneumatic connections.

Note
A source of instrument air is optional at the transmitter for reference air use. Since the device can be equipped with an in-place calibration feature, you can make provisions to permanently connect calibration gas bottles to the transmitter. If you are permanently connecting the calibration gas bottles, use a check valve next to the calibration fittings on the integral electronics. The check valve is to prevent breathing of the calibration gas and subsequent flue gas condensation and corrosion. The check valve is in addition to the stop valve in the calibration gas kit and solenoid valves in the SPS 4001B.

2.4 Installation of legacy probes with Rosemount CX2100 Remote Electronics

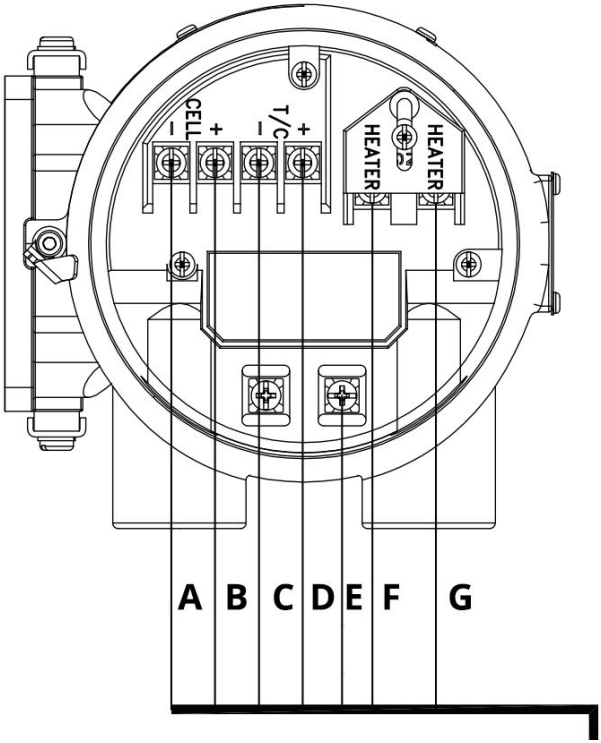
Refer to Rosemount 6888A Manual or Rosemount Oxymitter DR Manual for installation instructions.

2.4.1 Wire Rosemount 6888 or Oxymitter Direct Replacement (DR) Probe with CX2100 Remote Electronics Transmitter

Procedure

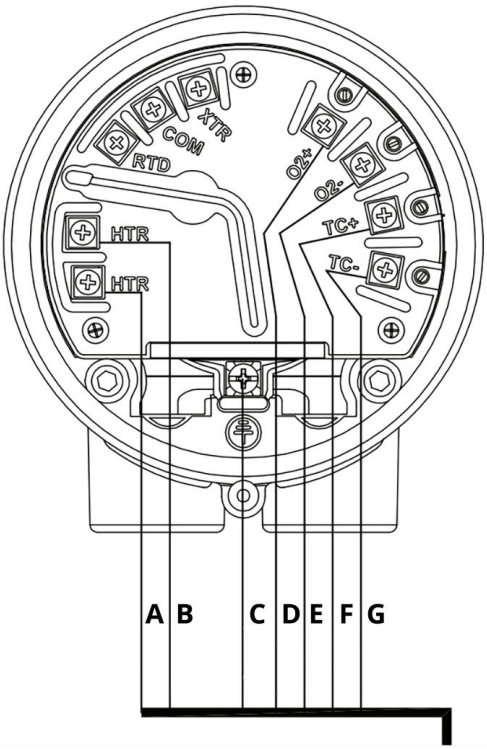
1. Remove cover from probe.
2. Feed all DR probe wiring through the probe's line power conduit.
3. Connect DR probe heater power leads to DR probe connectors as shown in Figure 2-17 or Figure 2-18.

Figure 2-17: Oxymitter DR Probe



A. Blue (oxygen [O2]-)
B. Orange (O2+)
C. Red (thermocouple [TC]-)
D. Yellow (TC+)
E. Green (ground [GND])
F. White (heater [HTR])
G. Black (HTR)

Figure 2-18: 6888 DR Probe



A. White (HTR)
B. Black (HTR)
C. Green (GND)
D. Orange (O2+)
E. Blue (O2-)
F. Yellow (TC+)
G. Red (TC-)

4. Connect O_2 signal and thermocouple wires to DR probe connectors.
5. Run the seven-conductor cable from the probe installation site to the remote electronics transmitter installation site.
    a) Install the seven-conductor cable at the remote electronics junction box.

b) Connect the heater power lines to the two HTR terminals shown in Figure 2-15.

c) Connect the oxygen signal lines to the O2– and O2+ terminals shown in Figure 2-15.

d) Connect the thermocouple lines to the TC– and TC+ terminals shown in Figure 2-15.

e) Connect the safety ground wire to the ground lug as shown in Figure 2-15.

f) Terminate the shield at the transmitter junction box housing.

g) Reinstall cover on junction box.

2.4.2 Wiring Rosemount CX2100DR to Rosemount 6888 Xi

Refer to *Rosemount 6888 Xi Manual* for installation instructions.

3 Configuration, start-up, and operation

⚠ WARNING

Electrical shock

Failure to install covers and ground leads could result in serious injury or death.

Install all protective covers and ground leads after installation.

3.1 Powering up Rosemount CX2100 Analyzer

3.1.1 Power up Rosemount CX2100 TR Remote Electronics or CX2100 PI Integral Electronics Probe

Prerequisites

Verify that the cables are connected to the analyzer as described in Figure 2-11.

Verify that all analyzer covers and seals are closed.

Maximum power of analyzer: 270 VA

Procedure

1. Apply AC line power to the analyzer.
2. Using either the distributed control system (DCS) or a communication device, verify communication to the analyzer.

The probe takes approximately 25 minutes to warm up to the +1357 °F (+736 °C) heater set point. The 4-20 mA signal remains at a default alarm level, and the O_2 reading displays `NaN` during the warm-up period. After warm-up, the probe begins reading oxygen, and the 4-20 mA output is based on the default range of 0 to 10 percent O_2.

If there is an error condition at start-up, the analyzer displays an alarm message.

Postrequisites

Emerson recommends waiting at least two hours after powering up the CX2100 before calibrating.

3.1.2 Powering Rosemount CX2100DR with other electronics

Refer to the electronics manual for start-up procedure.

3.2 *Guided Setup*

When you first power up the analyzer, a ***Guided Setup*** program will guide you through the basic setup procedure.

Once configured, the analyzer retains the set parameters. At the end of the ***Guided Setup*** program, the analyzer prompts you to choose if ***Guided Setup*** will repeat at each start-up.

Procedure

1. When the analyzer turns on, the ***Guided Setup*** screen appears. The first screen reads `Do you want Help configuring this device?`
   - Select **Yes** to continue with ***Guided Setup***.
   - Select **No** to exit ***Guided Setup***.

   The ***Guided Setup*** program guides you through several screens that allow you to configure a range of instrument settings.
2. Follow ***Guided Setup*** screens to configure analyzer settings.

   You can access ***Guided Setup*** at any time from the ***Configuration*** menu.

   The ***Guided Setup Complete*** screen reads: `Guided setup is complete. Do you want this device to prompt guided setup at each start-up?`
3. Select **Yes** or **No**.

Once the Guided Setup is complete, the display returns to the main screen.

3.3 Input/output configuration

The Rosemount CX2100 Analyzer has three channels with configurable inputs and outputs.

Channel A is always configured as the 4-20 mA output signal. **Channels B** and **C** can be configured to output a status via **Relay** output or can be configured to the optional **Autocalibration** feature using the Rosemount SPS 4001B accessory or the optional **Flame Safety Interlock** feature.

Channel	Input/output options
A	mA Output

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

3.3.1 Configure mA Output and HART®

Channel A is always configured to output the 4-20 mA signal. The 4-20 mA signal represents the O_2 value. Superimposed on the 4-20 mA signal is HART information that is accessible through a communication device or AMS software.

Procedure

On the Rosemount CX2100, go to **Configuration** → **Inputs/Outputs** → **Channel A**.

From this menu, you can configure the following:

- Power Mode
- External (passive) or Internal (active)
- Alarm Levels
- mA Output Upper Range Value (URV) and Lower Range Value (LRV)

You can also configure HART settings within the ***Channel A*** menu, including:

- Tags
- Loop Current Mode
- Burst Messages

3.3.2 Configure **Autocalibration**

The **Autocalibration** feature allows for automated calibration to be run using the Rosemount SPS 4001B accessory. The Rosemount CX2100 can be configured to automatically run calibration sequences or calibration check sequences.

Procedure

Ensure that the CX2100 is wired to the SPS 4001B to enable the **Autocalibration** feature.

Postrequisites

Refer to the Rosemount SPS 4001B Reference Manual for SPS wiring details.

Related information

Wire Rosemount CX2100 Transmitter for integral or remote configuration

3.3.3 Configure **Flame Safety Interlock**

The **Flame Safety Interlock** feature allows the power to be disconnected when the analyzer detects a loss of process flame.

The input for the **Flame Safety Interlock** is internally powered by the Rosemount CX2100 electronics and is actuated via a dry contact output from the process flame scanner.

Procedure

Ensure that the CX2100 Analyzer is wired to enable the **Flame Safety Interlock** feature.

Related information

Wire Rosemount CX2100 Transmitter for integral or remote configuration

3.3.4 Configure **Relay** output

Relays can be configured to trigger On Alarm upon low oxygen levels, when a calibration is recommended, or when the device is in a calibration procedure.

Latching behavior and **Relay** default state can also be configured. **Relay** is always open when unpowered.

Relay Trigger	Relay Latch	Relay Type
• On Alarm • Low Oxygen • Calibration Recommended • In Calibration	• On • Off	• Normally Open • Normally Closed

3.4 Calibration

3.4.1 Calibrate manually

A technician can calibrate the Rosemount CX2100 Probe using the CX2100local operator interface (LOI) or using HART® communication to a communication device or AMS console.

Prerequisites

Before beginning calibration, ensure that the analyzer is configured to the desired calibration settings. On the LOI, go to **Configuration** → **Calibration**. For best results, calibrate the analyzer at least two hours after it has reached its 1357 °F (+736 °C) operating temperature and while the process is running.

Procedure

1. On the LOI, navigate to **Service Tools** → **Calibration** → **Run Manual Calibration**.
2. When ready to begin manual calibration, select **Start Calibration**. Follow the directions on LOI screens.
3. Apply Gas 1. Turn nozzle on Manual Calibration to Low Gas or High Gas (depending on how Gas 1 or Gas 2 is configured). Set gas flow rate to 5 scfh (2.5 L/min.). Press **Continue**.

   Do not adjust the flow rate on subsequent calibrations even if the flow rate decreases. Only make flow rate adjustments when a new diffuser is installed.

   The ***Gas 1 Stabilizing*** menu will appear. The transmitter will automatically detect stabilization of calibration gas (0.15 mV/min). This step can take up to 600 seconds. When the calibration gas is successfully collected, the ***Gas 1 Collected*** menu will appear.
4. Press **Continue**.
5. Repeat Step 3 and Step 4 for Gas 2.
   At this point, the calibration should be complete. A ***Calibration Passed*** or ***Calibration Failed*** screen will appear.
6. Acknowledge the ***Calibration Passed*** or ***Calibration Failed*** screen.
   The ***Remove Calibration*** screen will appear.
7. Press **Continue**.
8. Remove calibration gas by closing the nozzle.

   The calibration port must be sealed during normal operation.

   The ***Gas Purging*** screen will appear.
9. Once the gas has been purged, press **Continue**.

The electronics determine if the calibration was successful and calculate new calibration values. The analyzer does not automatically load new calibration values into the electronics after a successful calibration. You can accept or reject the new calibration values.

A significant calibration change may cause a bump in the O_2 readings at the distributed control system (DCS) console, causing operator concern. If you are using the electronics, the calibration log stores calibration data for the past 20 successful calibrations.

NOTICE

A loose or missing cap can permit fresh air to bias the O_2 readings high in processes that run at negative pressure.

Make sure the calibration gas port is capped tightly between calibrations.

Need help?
See Manual for product alerts if calibration fails.

Postrequisites

The analyzer can hold the 4-20 mA signal representing O2 or permit the signal to vary with the bottled gases. If the signal varies, you can trend a calibration record to the DCS. To trend a calibration record, go to **Detailed Setup** → **Calibration Setup** in the DCS.

3.4.2 Autocalibrate

Autocalibration requires a separate single probe sequencer (Rosemount SPS 4001B), which is a solenoid box for switching calibration gases.

Refer to the Rosemount SPS 4001B Manual for installation and start-up procedures.

Prerequisites

If using the O_2 measurement for automatic control, always place the O_2 control loop into **Manual** prior to calibrating. Always inform the operator prior to calibrating.

⚠ CAUTION

Calibration gas bottles are piped and under pressure at all times. Be sure to leak-check all fittings, tubes, and connections.

Always use dual-stage pressure regulators.

Ensure Channel B is configured for autocalibration.

Note
Before beginning calibration, ensure the analyzer is configured for the desired calibration settings. For best results, calibrate the analyzer at least two hours after it has reached its +1357 °F (+736 °C) operating temperature and while the process is running.

Procedure

Initiate automatic calibration in one of the following ways:

- On the local operator interface (LOI), go to **Service Tools** → **Calibration** → **Run Autocalibration**.
- Use HART® communication with a communication device or AMS.
- Use external contact closure on the SPS 4000.
- Set **Autocalibration interval**.
- Set **Start Time**.

The sequencer provides an `IN CAL` contact closure and a `CAL INITIATE` contact. The analyzer sequences the calibration gases into the sensing cell. The analyzer runs a gas stability check for both calibration gases. During the gas stability check, the analyzer runs a 300 second purge cycle, which lets the probe signal come back to the normal flue gas readings.

Postrequisites

The analyzer can hold the 4-20 mA signal representing O_2 or permit the signal to vary with the bottled gases. If the signal varies, you can trend a calibration record at the distributed control system (DCS). To trend a calibration record, go to **Configuration** → **Calibration Settings** → **Purge/Hold** → **mA Output** in the DCS.

3.5 Calibration check

You can use the O_2 drift check feature to validate that the current calibration is still valid or if you need to recalibrate.

When using this feature, a target gas of a known O_2 value is applied to the probe and measured over a timespan. Once the target gas has been measured, the analyzer calculates the differential between the measured O_2 and the known target gas O_2.

The calibration check threshold is set to a default of 0.2 percent of the target gas. This means that if the measured value drifts more than 0.2 percent of the target gas concentration, the calibration check will fail, and the analyzer will recommend a calibration.

You can also configure the O_2 drift value to your desired threshold.

3.5.1 Manual calibration check

Prerequisites

Before beginning calibration check procedures, ensure that the analyzer is configured to the desired calibration settings. On the local operator interface (LOI), navigate to **Configuration → Calibration Settings → Purge/Hold**.

Procedure

1. On the LOI, navigate to **Service Tools → Calibration → Run Manual Check**.
2. When ready to begin the manual calibration check, select **Start Check**. Follow directions on LOI screens.
3. Apply Gas 1/Target Gas. Turn nozzle on Manual Calibration to Low Gas or High Gas (depending on how Gas 1/Target Gas is configured). Set gas flow rate to 5 scfh (2.5 L/min). Press **Continue**.
   The ***Gas Stabilizing*** screen will appear. The transmitter will automatically detect stabilization of calibration gas (0.15 mV/min). This step can take up to 600 seconds. The ***Gas Collected*** screen will appear when the calibration gas is successfully collected.
4. Press **Next**.
   The calibration check should be complete at this point. A ***Cal Check Passed***, ***Cal Recommended*** or ***Cal Check Failed*** screen will appear.
5. Acknowledge ***Cal Check Passed***, ***Cal Recommended***, or ***Cal Check Failed***. Press **OK**..
   The ***Remove Cal Gas*** screen will appear.
6. Press **Continue**.
7. Remove gas by closing the nozzle.

   The calibration port must be sealed during normal operation.

   The ***Gas Purging*** screen will appear.
8. Once the gas has been purged, the screen will return to the main screen.

3.5.2 Automatic calibration check

The automatic calibration check runs the same program as the manual calibration check, but it is run automatically using the Rosemount SPS 4001B.

You can initiate an automatic calibration check through HART® communication or from **Service Tools → Calibration → Run Autocal Check → Start Check**. Automatic calibration check can also be

configured to run a new calibration automatically when a calibration check fails.

4 Product certifications

4.1 Directive information

A copy of the Declaration of Conformity can be found at the end of the Quick Start Guide.

The most recent revision of the Declaration of Conformity can be found at Emerson.com.

4.2 Ordinary location certification

As standard, 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).

4.3 Installing equipment 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.

Non-standard paint options may cause risk from electrostatic discharge. Avoid installations that could cause electrostatic build-up on painted surfaces and only clean the painted surfaces with a damp cloth. If paint is offered through a special option code, contact the manufacturer for more information.

4.4 USA/Canada

Applies to Rosemount CX2100TR only.

Model string option code	E5, E6, KB
CSA Certificate	80200788
Markings	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 ≤ Ta ≤ +65 °C

4.4.1 Conditions of acceptability

1. Units installed with conduit runs must have suitably certified conduit seals installed at the enclosure.
2. Units installed with other than conduit runs and conduit seals, must be fitted with certified or listed cable glands for use in “Class 1, Zone 1, Ex/AEx db IIB+H2” and “Class 1, Division 1, Group B, C and D” or better, suitable for the ambient temperature range.
3. Flameproof joints are not intended to be repaired.
4. Clamp screw requires Class 70 tensile strength.

4.5 Europe

4.5.1 ATEX

Applies to Rosemount CX2100 Remote Transmitter (TR) only.

ATEX model string option code	E1
ATEX Certificate	ATEX CSACa 24ATEX1010X
Markings	 II 2 G Ex db IIB+H2 T6 Gb -40 °C ≤ Ta ≤ +65 °C

ATEX Specific Conditions of Use (X):

1. Flameproof joints are not intended to be repaired.
2. Clamp screw requires Class 70 tensile strength.

4.5.2 IECEx

Applies to Rosemount CX2100 Remote Transmitter (TR) only.

Model string option code	E7
IECEx Certificate	IECEx CSA 24.0048X
Markings	Ex db IIB+H2 T6 Gb -40 °C ≤ Ta ≤ +65 °C

IECEx Specific Conditions of Use (X):

1. Flameproof joints are not intended to be repaired.
2. Clamp screw requires Class 70 tensile strength.

4.6 Declaration of Conformity

EMERSON.

EU DECLARATION OF CONFORMITY

CE

RAD1164 Rev. A

This declaration of conformity is issued under the sole responsibility of

Rosemount Inc.
6021 Innovation Blvd
Shakopee, MN 55379
USA

that the following products,

Rosemount™ Oxygen Analyzer model CX2100 Series

comply with the provisions of the European Union Directives, including the latest amendments, valid at the time this declaration was signed.

July 18, 2025 | Mark Lee | Vice President, Quality | Boulder, CO, USA

(signature & date of issue) (name) (function) (place of issue)

Authorized Representative in Europe:
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ATEX Notified Bodies for EU Type Examination Certificates:
CSA Group Netherlands B.V. [Notified Body Number: 2813]
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ATEX Notified Body for Quality Assurance:
SGS Fimko Oy [Notified Body Number: 0598]
Takomotie 8
FI-00380 Helsinki
Finland

EMC Directive (2014/30/EU)
Harmonized Standards:
EN 61326-1:2013

Low Voltage Directive (2014/35/EU)
Harmonized Standards:
EN 61010-1:2010

RoHS Directive (2011/65/EU)
Harmonized Standards:
EN IEC 63000:2018

ATEX Directive (2014/34/EU)
(Only valid for Model CX2100TR)
ATEX CSACa 24ATEX1010X – Flameproof
Equipment Group II 2 G
Ex db IIB+H2 T6 Gb (-40°C ≤ Ta ≤ +65°C)

Harmonized Standards:
EN IEC 60079-0:2018
EN 60079-1:2014

4.7 China RoHS table

4.0 DISCLOSURE TABLES FOR COMBUSTION ANALYTICAL PRODUCTS

Table 1A: List of QSG's Applicable to Table 1B

Quick Start Guide P/N	Model #	Quick Start Guide (QSG) Description
00825-0100-9740	CX2100	Rosemount™ CX2100 In-Situ Oxygen QSG

Table 1B: Disclosure Table for QSG

含有China RoHS管控物质超过最大浓度限值的部件型号列表 [CX2100]
List of [CX2100] Parts with China RoHS Concentration above MCVs

部件名称 Part Name	有害物质 / Hazardous Substances					
	铅 Lead (Pb)	汞 Mercury (Hg)	镉 Cadmium (Cd)	六价铬 Hexavalent Chromium (Cr +6)	多溴联苯 Polybrominated biphenyls (PBB)	多溴联苯醚 Polybrominated diphenyl ethers (PBDE)
电子组件 Electronics Assembly	X	O	O	O	O	O
传感器组件 Sensor Assembly	X	O	O	O	O	O
壳体组件 Housing Assembly	X	O	O	O	O	O

本表格系依据SJ/T11364的规定而制作.
This table is proposed in accordance with the provision of SJ/T11364.

O: 意为该部件的所有均质材料中该有害物质的含量均低于GB/T 26572所规定的限量要求.
O: Indicate that said hazardous substance in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.

X: 意为在该部件所使用的所有均质材料里，至少有一类均质材料中该有害物质的含量高于GB/T 26572所规定的限量要求.
X: Indicate that said hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.

Table 1D: Disclosure Table for Spare Parts

部件名称 Part Name	组装备件说明 Spare Parts Descriptions for Assemblies
电子组件 Electronics Assembly	电子显示器组装 LOI Display Assembly
	发射器印刷电路组件 Transmitter PCA Assembly
	电子连接器组件 Phoenix Connector Assembly
	电缆组件 Cable Assembly
	远程电缆组件 Remote Cable Assembly
	接线盒印刷电路组件 Junction Box PCA Assembly
	玻璃接头 Glassed Header
传感器组件 Sensor Assembly	传感器组件 Probe

Quick Start Guide
MS-00825-0100-9740, Rev. AC
July 2025

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

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