Reference Manual
00809-0100-4110, Rev AB
May 2023

Rosemount™ CX1100 In-Situ Oxygen Transmitter

ROSEMOUNT™

EMERSON™

Essential instructions

Read this page before proceeding!

Emerson™ designs, manufactures, and tests its products to meet many national and international standards. Because these instruments are sophisticated technical products, you must properly install, use, and maintain them to ensure they continue to operate within their normal specifications. The following instructions must be adhered to and integrated into your safety program when installing, using, and maintaining Emerson products.

- Read all instructions prior to installing, operating, and servicing the product.
- Install equipment as specified in the installation instructions of the appropriate instruction manual and per applicable local and national codes. Connect all products to the proper electrical and pressure sources.

Symbols used on equipment and in instruction manual


Earth (ground) terminal


Protective conductor terminal


Risk of electrical shock


Hot surface


Refer to Manual.


Equipment protected throughout by double insulation
(applies to Rosemount CX1100 Remote Transmitter housing only)

⚠ 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.

Contents

1 General information

1.1 Overview

The Rosemount™ CX1100 In-Situ Oxygen Transmitter provides a continuous, accurate measurement of the oxygen remaining in flue gases coming from a combustion process. Accurate measurements of furnace exhaust excess oxygen are critical for combustion optimization, which result in reduced energy costs, increased safety, and lower emissions. This product is intended for use for combustion applications only.

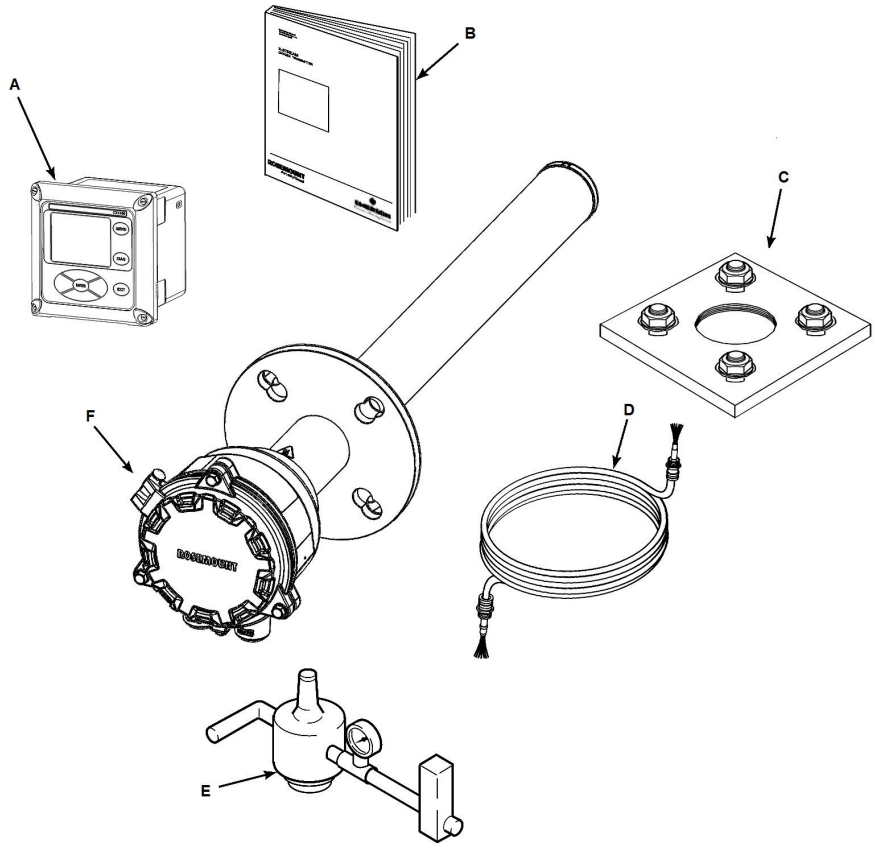
The Rosemount CX1100 probe contains a zirconia type oxygen sensor. At high temperatures, zirconia produces an electrical potential that is proportional to the difference in process oxygen concentration and ambient reference air. This voltage is transmitted to the Rosemount CX1100 remote transmitter and output as an analog signal. The sensor is mounted at the end of the probe tube which extends into a flue gas duct or stack. Varying lengths of the probe are available to achieve desired insertion depths. The probe tube also houses a heating element to precisely control the temperature of the sensor, reducing errors induced by varying process temperatures.

1.2 Rosemount CX1100 Oxygen Probe and Transmitter

A complete Rosemount CX1100 In-Situ Oxygen Transmitter system includes a probe and remote transmitter. Raw signals (sourced from the heater thermocouple and oxygen sensor) and power are transmitted between the Rosemount CX1100 probe and the Rosemount CX1000 remote transmitter, interconnect wiring consisting of nine conductors. The specifications of the wiring arrangement can be found in Wire. If following the specifications, 200 ft. (61 m) is the maximum cable length allowed.

1.3 Typical system package

Figure 1-1: Typical System Package



A. Rosemount CX1100 Remote Transmitter
B. Quick Start Guide
C. Optional mounting or adapter plate
D. Interconnect cable (user-supplied)
E. Optional calibration gas flowmeter
F. Rosemount CX1100 Probe

1.4 Rosemount CX1100 In-Situ Oxygen Transmitter ordering information

Model	Product description
CX1100	In-Situ Oxygen Transmitter
Material	
A	304L stainless steel
Probe length	
050	1.64 ft. (0.5 m) oxygen probe
100	3.28 ft. (1.0 m) oxygen probe
200	6.56 ft. (2.0 m) oxygen probe
Probe mounting flange	
F20	ANSI/DIN: 4.75 in. / 5.71 in. bolt circle, 0.75 in. holes
Transmitter	
M7	Remote transmitter with LCD display and interface
M0	Probe only (no transmitter)
Product certification	
G6	CSA ordinary location
Probe mounting hardware	
N1	New installation plate - ANSI pattern
N2	New installation plate - DIN pattern
Transmitter mounting hardware	
T3	2-in. pipe / wall mount kit
Calibration accessories	
F1	Calibration gas flowmeter

1.5 Specifications

Table 1-1: System Measurement Specifications

Specification	Description
Net O_2 range	0 - 23%
Repeatability	0.1% of O_2 or 1.0% of reading, whichever is lower
Lowest detectable limit	0.05% O_2
Process temperature effect	Less than 0.3% O_2 from 77 to 1292 °F (25 to 700 °C)
System speed of response to calibration gas	Initial response in less than 3 seconds, T90 in 10 seconds. Response to process gas changes will vary depending on process gas velocity and particulate loading of the diffuser.

Environmental specifications

Table 1-2: Probe

Specification	Description
Probe	Process wetted materials are 304 stainless steel.
Maximum process temperature	752 °F (400 °C)

Table 1-3: Probe Terminations

Specification	Description
Rosemount CX1100 probe ambient temperature limits	-4 to 158 °F (-20 to 70 °C)

Table 1-4: Remote Display

Specification	Description
Materials	Polycarbonate
Ambient temperature limits	-4 to 122 °F (-20 to 50 °C)

Installation specifications

Table 1-5: Probe

Specification	Description
Probe mounting range	Vertical or horizontal: 2-in. 150# (4.75 in. (121 mm) bolt circle) and DIN145 **Note** Flanges are flat-faced and for mounting only. Flanges are not pressure-rated. A 2.5-in. diameter hole in the process is required. Many adapter flanges are available to mate to existing flanges.
Reference air	No instrument air required. Ambient air diffuses into the probe passively. Ensure that ambient air is fresh (20.95% O_2).

Table 1-5: Probe *(continued)*

Specification	Description
Calibration	Semi-automatic manual gas switching. New calibration values are calculated in the remote electronics.
Cal gases	0.4% and 8% O_2, balance N_2 recommended. Instrument air may be used as a high cal gas, but is not recommended. 100% nitrogen cannot be used as a low cal gas.
Calibration gas flow	5 scfh (2.5 l/min) at 15 PSI
Heater electrical power	120/240 Vac, 50/60 Hz, 1.8 A Max
Traditional architecture cable	Customer-supplied
Power consumption of probe heater	150 watts max. during initial warm-up

Table 1-6: Remote Electronics

Specification	Description
Electrical power	120/240 Vac, 50/60 Hz, 1.8 A Max
Power consumption	150 watts during initial warm-up
Analog output	4-20 mA. Max load 550 Ohms
Alarms relays	Two SPDT Form C, epoxy sealed contacts rated 5A, 30 Vdc, 120 Vac, or 230 Vac; user configurable to alarm. Resistive load: 5A at 28 Vdc or 300 Vac Inductive load: 1/8 HP at 120/240 Vac
Probe sensing cable	3 twisted pair conductors, 22 ga overall shielded cable to connect the TC, O_2, and CJC signals
Heater cable	3 multi conductor 18 ga shielded cable to connect the heater control signal

Rosemount CX1100 Probe	Shipping weight	Actual weight
19.68 in. (0.5 m)	19 lb. (8.6 kg)	13.5 lb. (6.1 kg)
39.37 in. (1 m)	23 lb. (10.43 kg)	16.8 lb. (7.6 kg)
78.74 in. (2 m)	30.5 lb. (13.8 kg)	23 lb. (10.43 kg)

Rosemount CX1100 Remote Transmitter dimensions in inches (millimeters)	Shipping weight	Actual weight	Part number
6.10 x 6.10 x 5.15 in. (155 x 155 x 131 mm)	4 lb. (1.8 kg)	3 lb. (1.4 kg)	24490-00

Accessory	Part number
Calibration flowmeter	771B635H01
Cal gas adaptor kit to mate to existing tubing arrangement	1A98771H07

2 Install

⚠ WARNING

Failure to follow safety instructions could result in serious injury or death.

Before installing this equipment, read the Essential instructions at the front of this Reference Manual.

⚠ WARNING

ELECTRIC SHOCK

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

Install all protective equipment covers and safety ground leads after installation.

⚠ CAUTION

Equipment damage

Damage to the transmitter may result.

Do not allow the temperature of the probe electronics to exceed 194 °F (90 °C)

2.1 Install probe

Emerson can supply a weld plate for welding to the flue gas duct for new installations.

Procedure

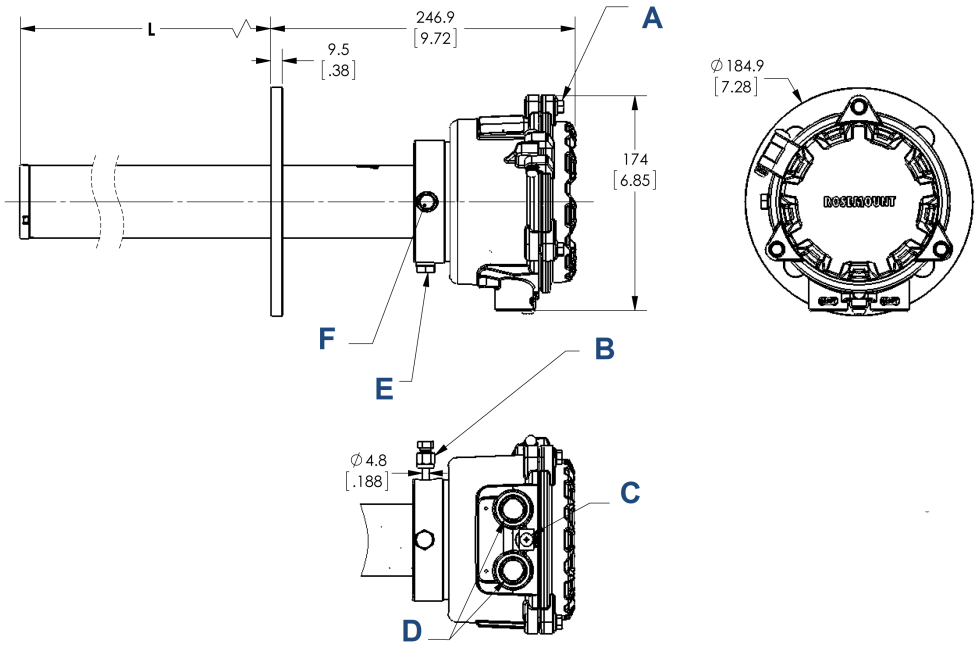
1. If using the standard square weld plate (Figure 2-2) or an optional flange mounting plate, weld or bolt the plate onto the duct.

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

2. Insert probe through the opening in the mounting flange and bolt through the probe gasket and flange.

   For horizontal installations, the breather port must be oriented such that it is facing downward.

Figure 2-1: Probe installation



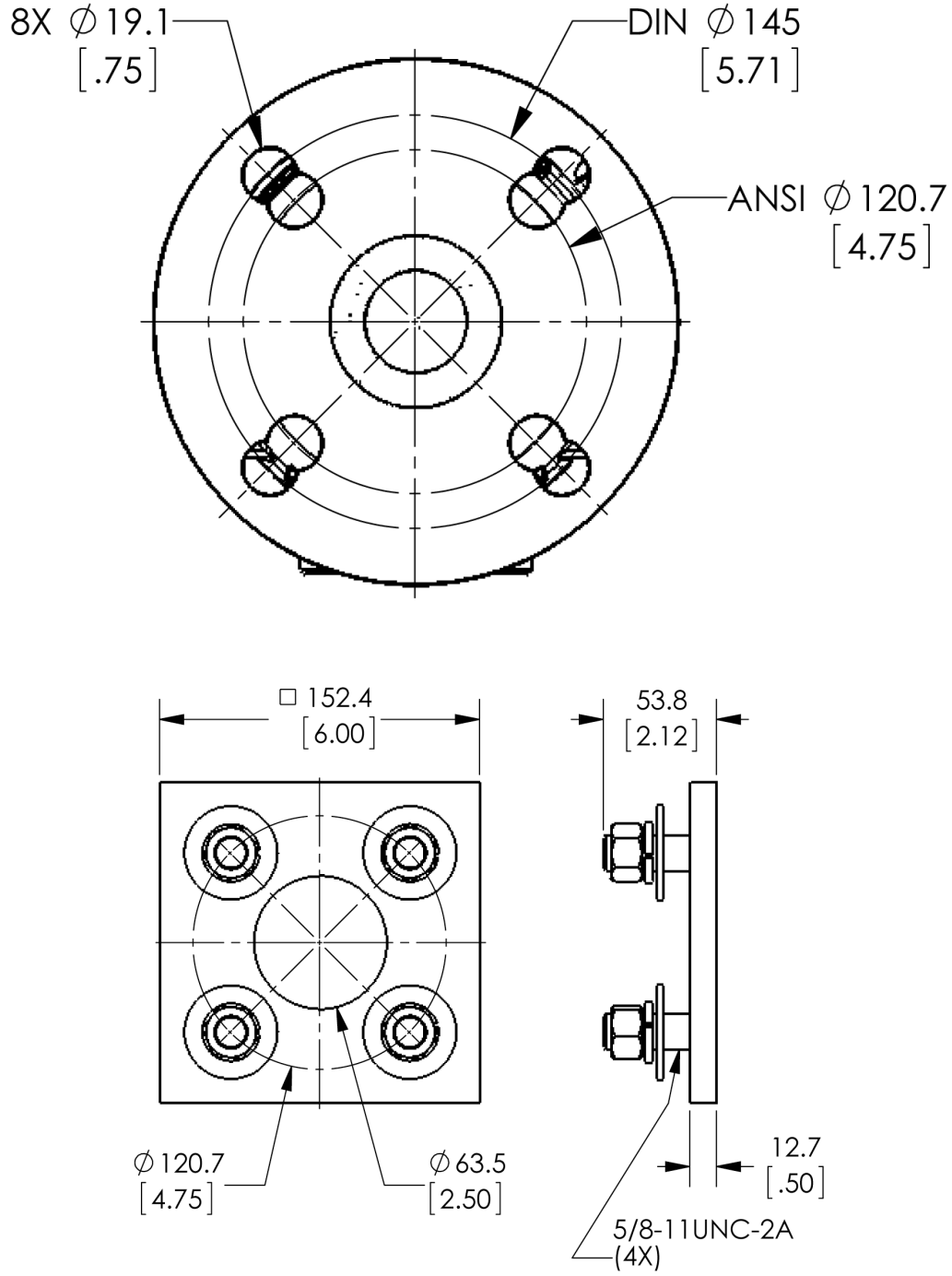
All dimensions are in millimeters with inches in parentheses.

A. *M6 X 1 X 25 hex head machine screw (3X)*
B. *Calibration gas, 4.8 mm (3/16-in.) tube fitting, 2.82 liter/minute (10 SCFH), 138 kPa (20 psig)*
C. *M5 X 0.8 x 10 pan head machine screw, ground screw*
D. *½ national pipe thread (NPT) conduit connection (power, signal)*
E. *Breather port*
F. *Calibration gas connection*

Table 2-1: Removal/installation

Probe length	Removal envelope
.5 m (19.68 in.)	750 mm (30 in.)
1 m (39.37 in.)	1250 mm (49 in.)
2 m (78.74 in.)	2250 mm (89 in.)

Figure 2-2: Probe installation



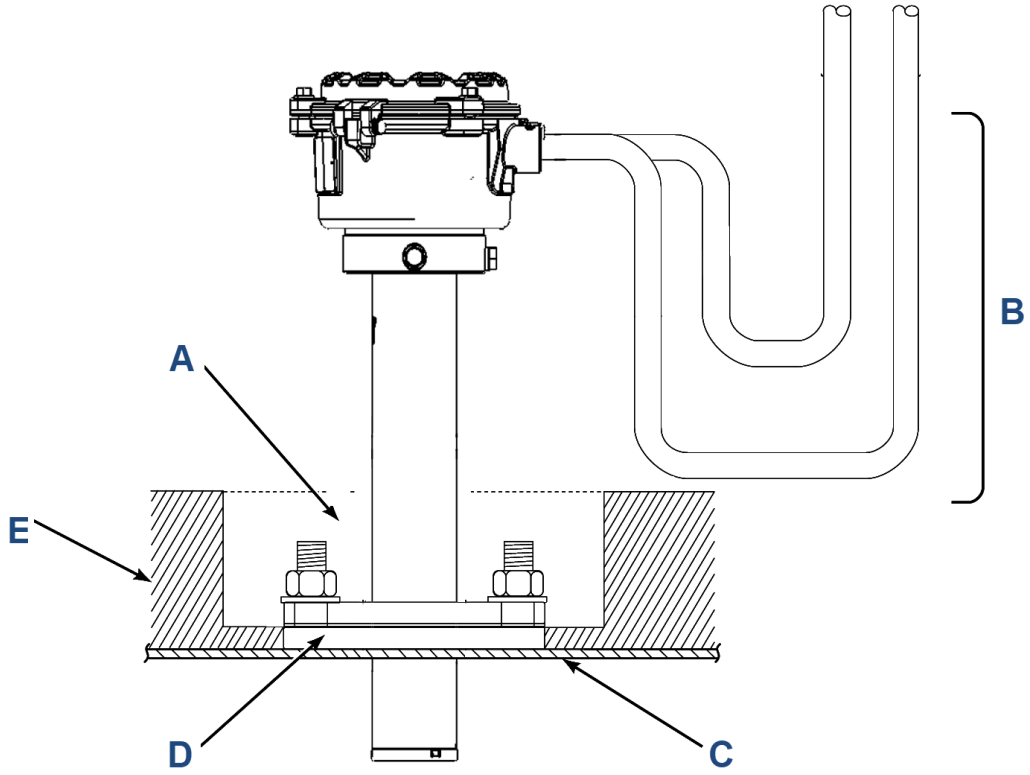
All dimensions are in millimeters with inches in parentheses.

Square weld plate, ANSI pattern part 4512C34G01

Table 2-2: Mounting flange

	ANSI	DIN
Flange diameter	185 mm (7.28 in.)	
Hold diameter	19.1 mm (.75 in.)	
4 holes equally spaced on BC	120.7 mm (4.75 in.)	145 mm (5.71 in.)

Figure 2-3: Drip loop and insulation removal



A. ***Note***
Replace insulation after installing Rosemount .

B. *Drip loop*
C. *Stack duct or metal wall*
D. *Adapter plate*
E. *Insulation*

Note
Probe installation may be vertical or horizontal.

2.2 Mount remote display

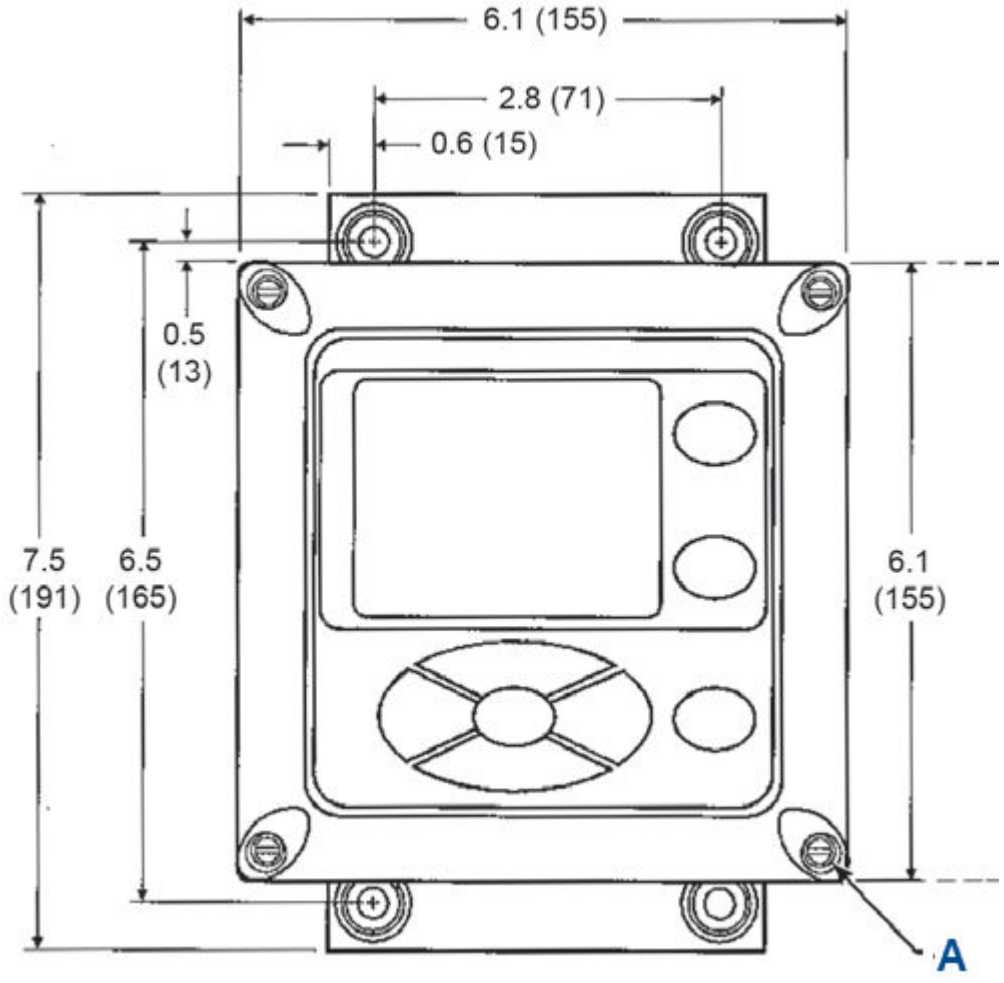
The remote transmitter is available in a panel mounting or wall/pipe mounting configuration.

Prerequisites

You need a wrench and bolts to mount the transmitter.

Note
Dimensions are in inches with millimeters in parentheses.

Figure 2-4: Wall/Surface Mount Front View



A. Four cover screws

Figure 2-5: Wall Mount Side View

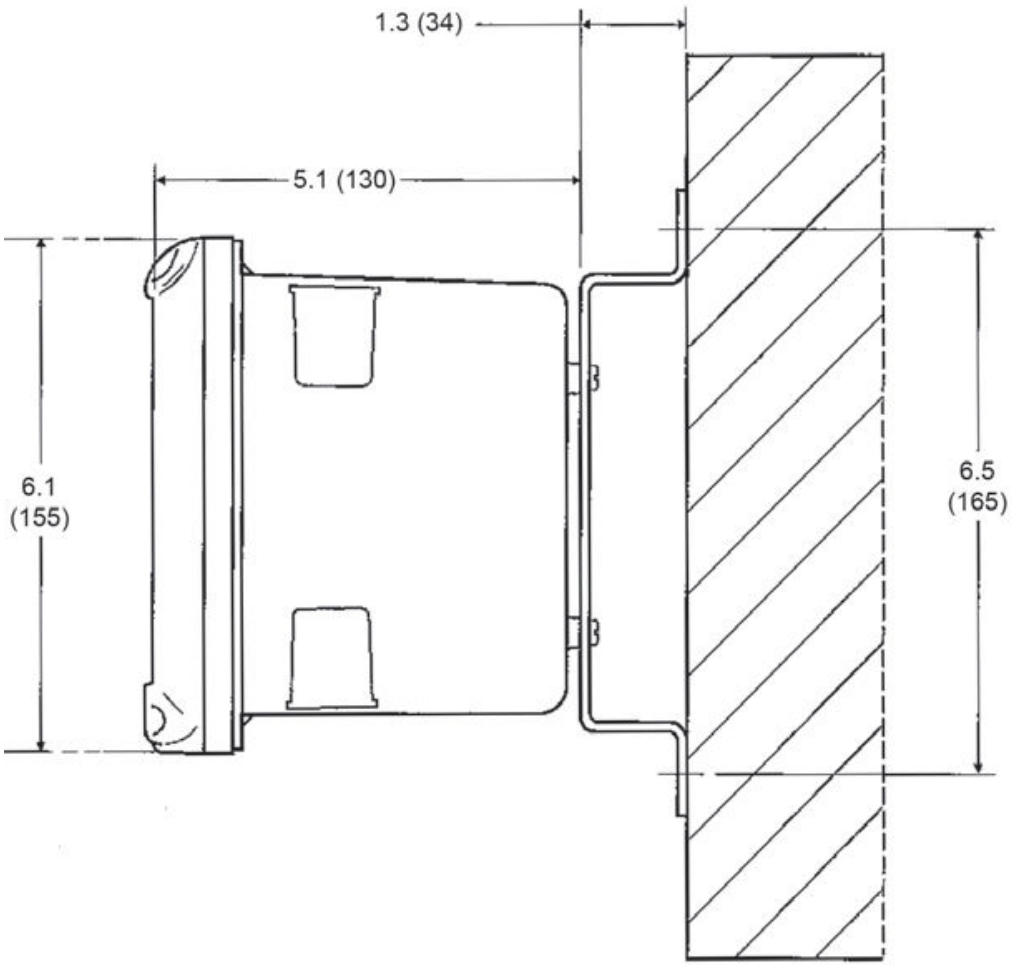
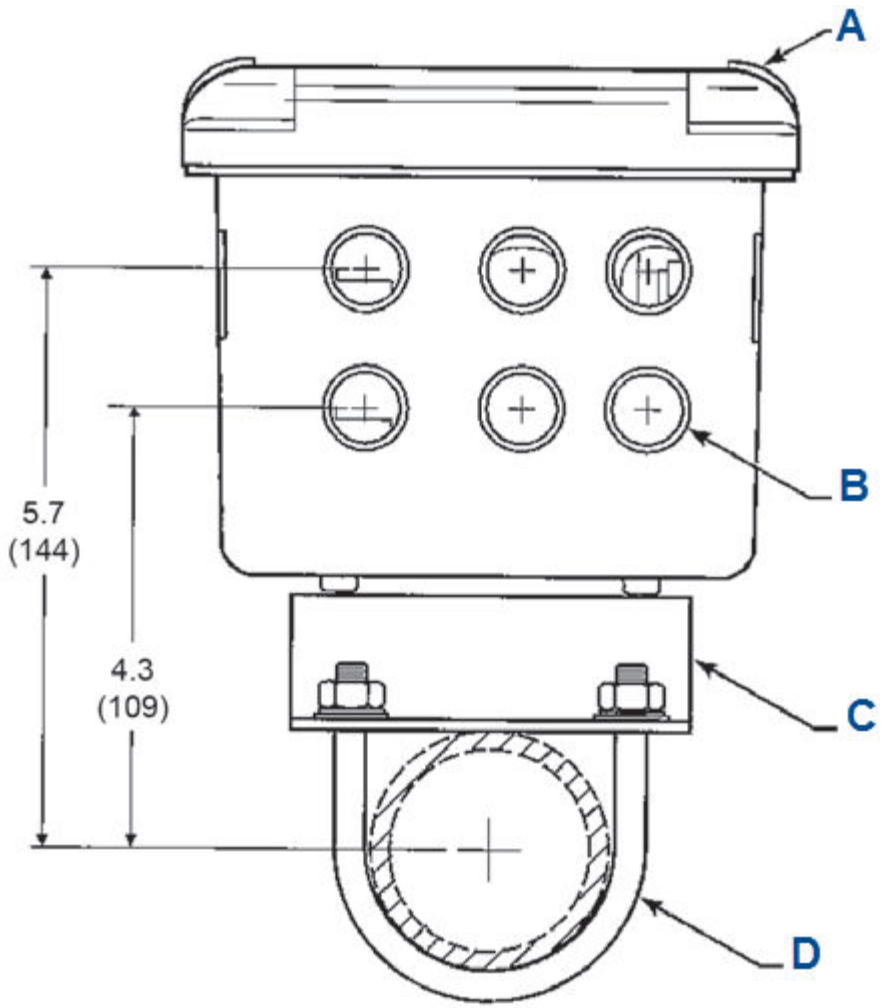
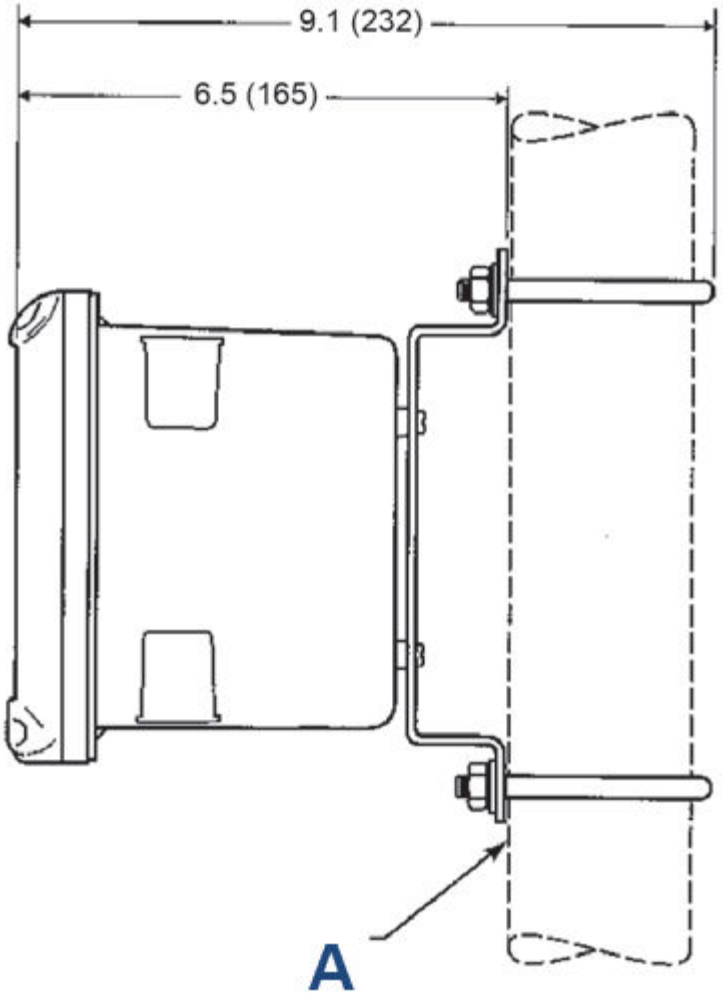


Figure 2-6: Pipe Mount Bottom View



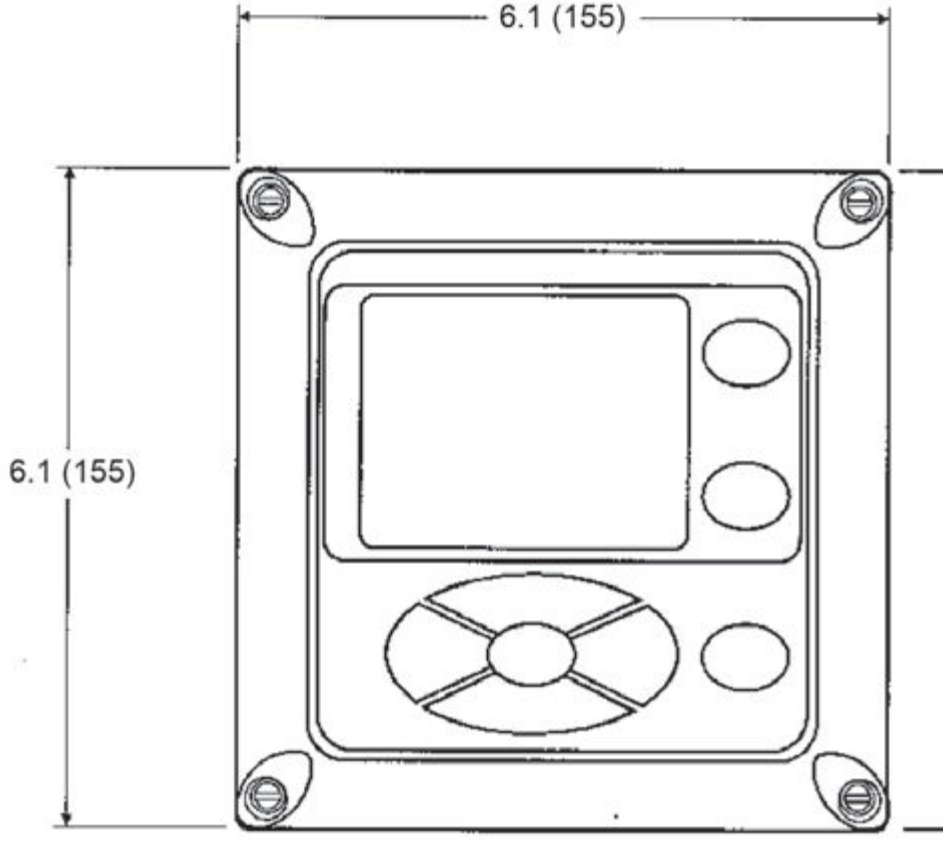
A. Front panel
B. Six ½-in. (12.7 mm) national pipe thread (NPT) conduit openings
C. Mounting bracket
D. U-bolts

Figure 2-7: Pipe Mount Side View



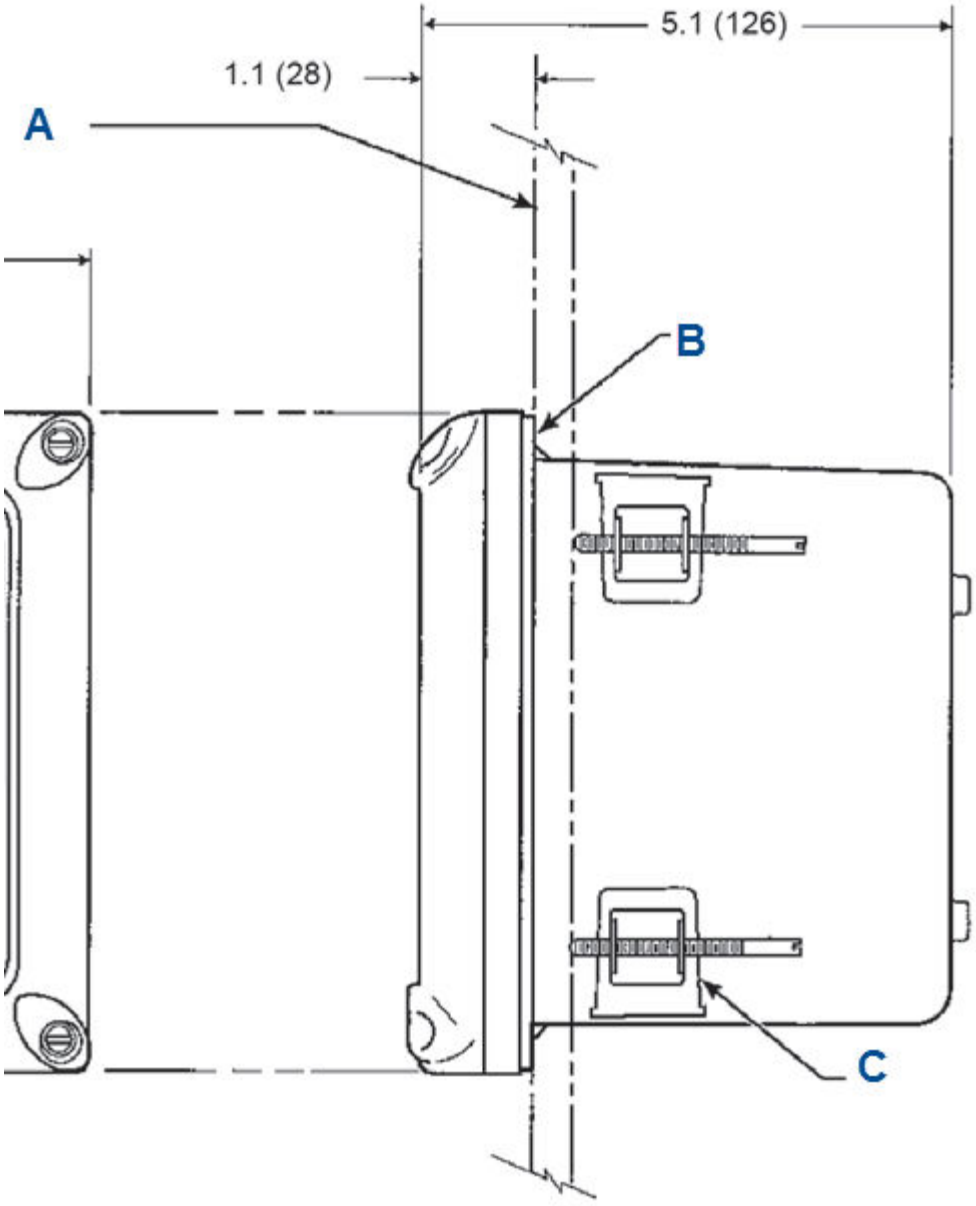
A. 2-in. (50.8 mm) pipe supplied by customer

Figure 2-8: Panel Mount Front View



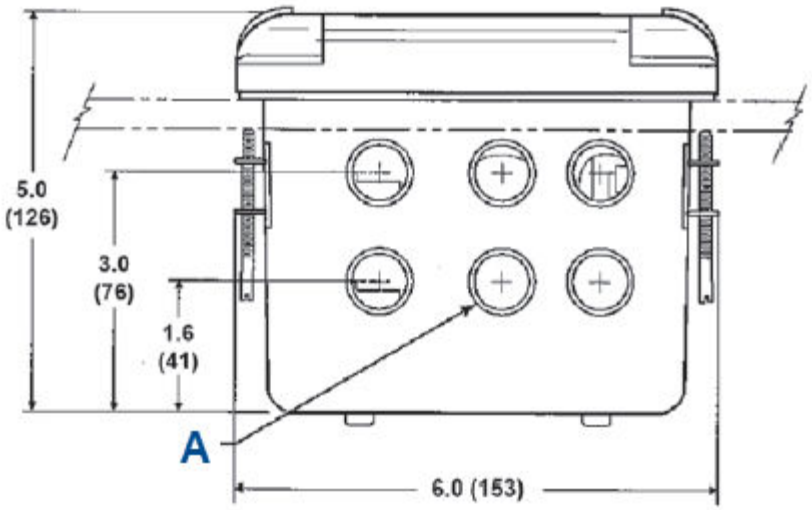
The front panel is hinged at the bottom. The panel swings down for easy access to the wiring locations.

Figure 2-9: Panel Mount Side View



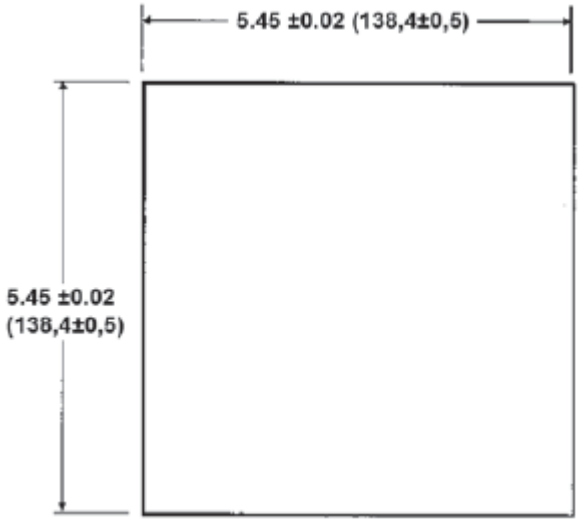
A. Maximum panel thickness 0.375 in. (9.52 mm)
B. Panel mount gasket
C. Four mounting brackets and screws provided

Figure 2-10: Panel Mount Bottom View



A. Six ½-in. (12.7 mm) NPT conduit openings

Figure 2-11: Panel Cut-Out



Procedure

1. Ensure all components are available to install the remote transmitter.
2. Select a mounting location near or removed from the probe.

   Consider the temperature limitations of the remote transmitter. Refer to product specifications when selecting the mounting location.
3. Mount at a height convenient for viewing and operating the interface.

   Emerson recommends approximately 5 ft. (1.5 m).
4. The keypad window on the transmitter may have an exterior protective membrane. Remove the protective membrane prior using the transmitter.

⚠ CAUTION

Failure to remove the protective membrane may cause the display to appear distorted. The membrane may become difficult or impossible to remove after extended use at elevated temperatures.

3 Wire

All wiring must conform to local and national codes.

⚠ WARNING

Failure to follow safety instructions could result in serious injury or death.

Before installing the equipment, read the safety instructions at the front of this document.

⚠ WARNING

To maintain proper earth grounding, ensure a positive connection exists between the probe terminations housing and earth. The connecting wire must be 14 AWG minimum.

⚠ WARNING

Line voltage, signal, and relay wiring must be rated for at least 221 °F (105 °C).

⚠ WARNING

The grounding plate inside the remote transmitter is not bonded to protective earth and does not provide adequate grounding.

If using metal conduit with the remote transmitter, reliably bond the conduit to protective earth.

3.1 Interconnect cable installation specifications

Customer supplied cable up to 200 ft. (60 m) long, rated for -40 to 194 °F (-40 to 90 °C) and voltage 300 VAC rms.

- Heater power: Three multi conductor 18 ga shielded cable to connect the heater control signal
- Probe sensing: Three twisted pair conductors 22 ga overall shielded cable to connect the thermocouple, O_2, and CJC signals

You can purchase these as two separate cables.

3.2 Connect the cables

The probe transmits raw voltages from the oxygen sensor and heater thermocouple to the remote transmitter. The remote transmitter also controls power to the probe heater in order to maintain the correct sensor temperature.

This arrangement calls for interconnect wiring consisting of nine conductors. Given the recommended wire specifications, the maximum length for this cable is 200 ft. (60 m) (refer to Interconnect cable installation specifications).

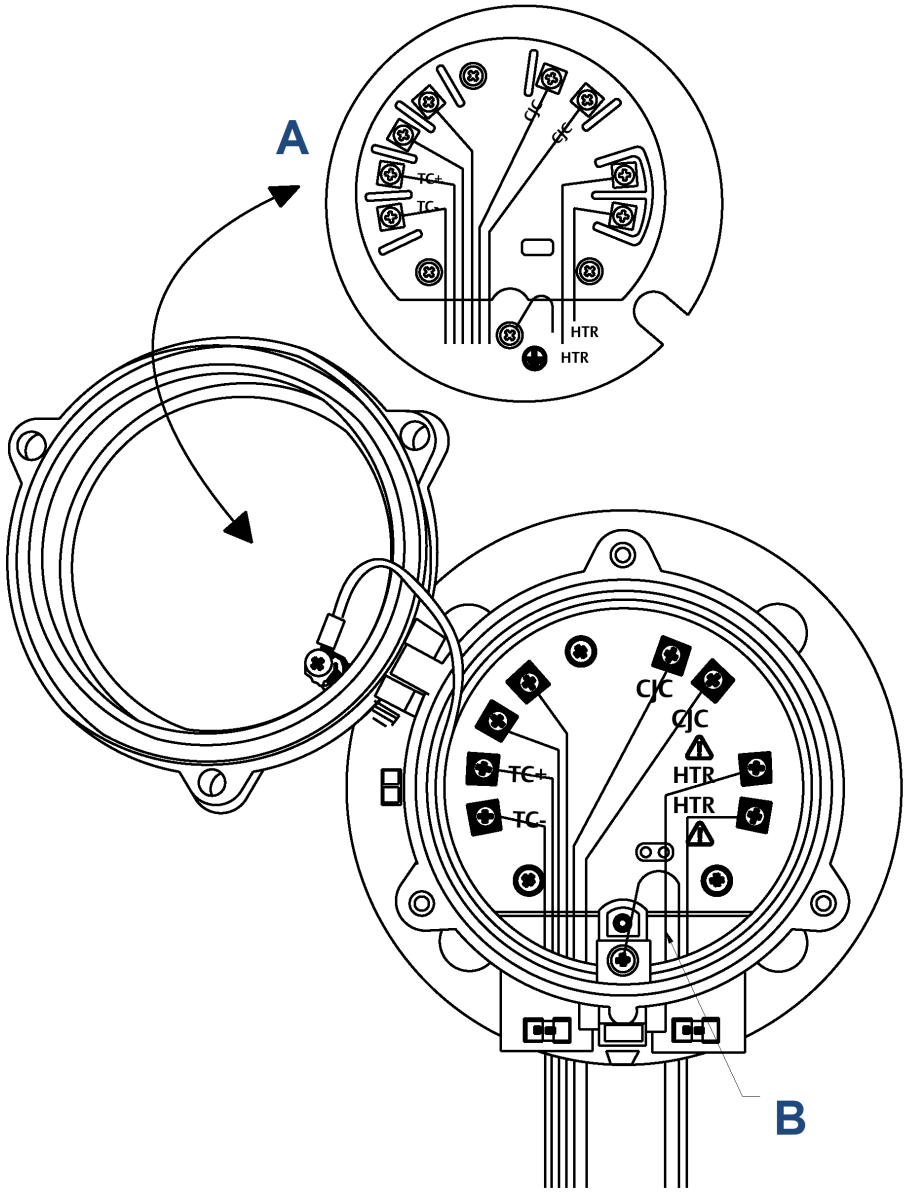
⚠ CAUTION

To maintain EMC/EMI noise protection, connect the customer-supplied nine conductor cable and cable glands properly to ground.

Procedure

1. Run the signal and power cables between the probe and the installation site for the optional remote transmitter.
2. Remove the covers from the probe and the remote transmitter (if applicable).
3. Feed all probe wiring through the conduit port of the probe.
4. Connect probe heater power leads to probe connector.
   Refer to Figure 3-1.

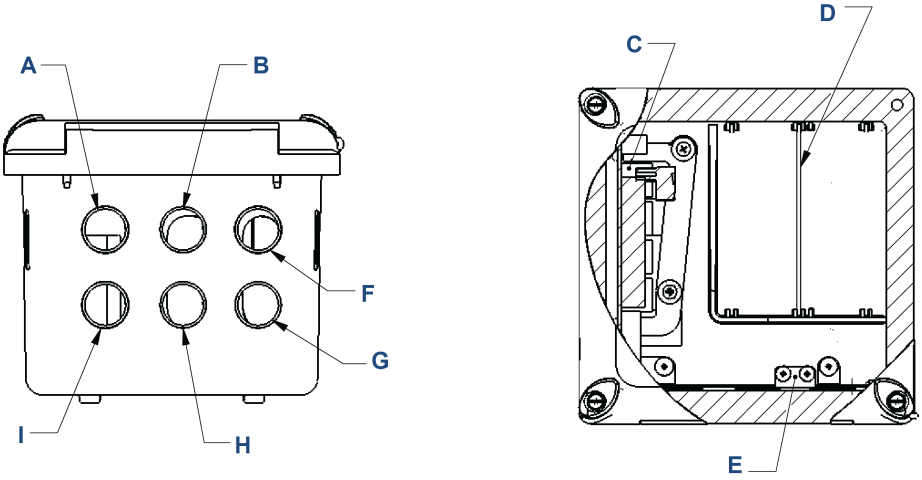
Figure 3-1: Closeup wiring diagram



A. Labels
B. M4 X 0.7 X 8 pan head screw machine screw (internal ground)

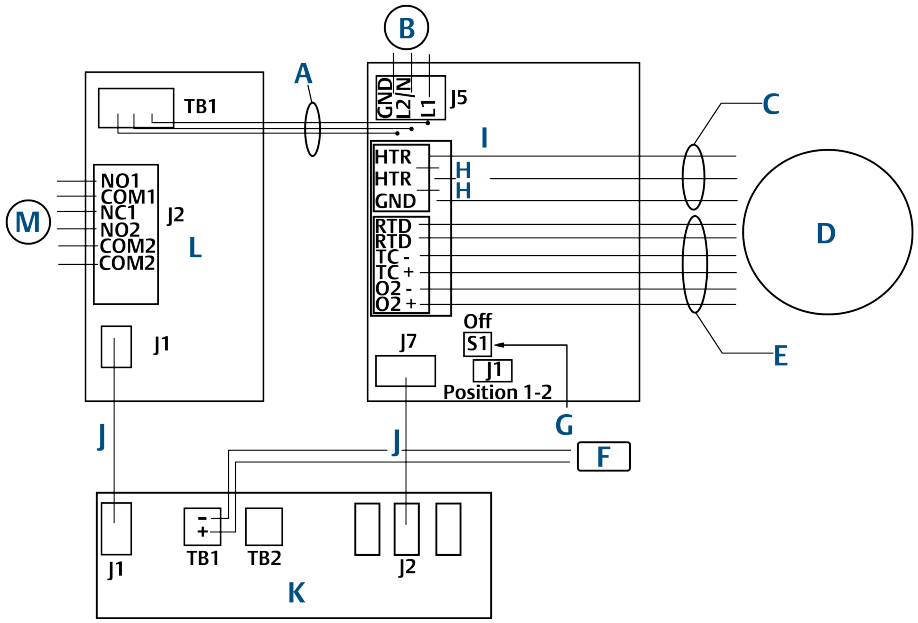
5. Connect O_2 signal, thermocouple, and cold junction (CJC) wires from the probe to the transmitter
6. At the transmitter, connect the cable leads to the connectors on the sensor board as indicated in Figure 3-2 and Figure 3-3.

Figure 3-2: Wiring head



A. 4-20 mA out
B. Heater power to probe
C. Power supply
D. Combustion sensor
E. Shield ground
F. Alternate 4-20 mA out
G. Signal from probe
H. Power to remote transmitter
I. Alarm relay

Figure 3-3: Wiring boards



A. AC power wires from power supply board to the underside of the sensor board are provided with the sensor board.
B. AC input
C. Heater power: terminates to underside of the sensor board.
D. Probe
E. Probe sensing: connects shield to ground.
F. 4-20 mA output
G. S1 Dip switch is for factory use only and should be in the Off position.
H. Not used
I. Sensor board
J. Ribbon
K. Main board
L. Power supply
M. Alarm relays output

4 Start up

Procedure

1. Apply AC line power to the remote transmitter.
   The probe takes approximately 45 minutes to warm up to the 1357 °F (736 °C) setpoint. The 4-20 mA signal remains at a default value of 3.5 mA, and the O_2 reading remains at 0% through the warm-up period.
2. 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 startup, an alarm message is displayed on the remote transmitter.

5 Calibration and maintenance

You can calibrate the Rosemount in the installed condition without removing the instrument from the process duct and also while the combustion process is online.

Gas is applied to the sensor through the calibration gas fitting. New Rosemount systems are factory calibrated and are generally acceptable for initial start-up and operation. To gain high accuracy, calibrate a system during normal operating conditions. Emerson recommends calibrating on a semi-annual to annual basis for most applications; however actual calibration frequency may vary per process unit.

Use a two-point calibration. Emerson recommends using 0.4 percent O_2 and 8.0 percent O_2 gases with a balance of nitrogen, as those are the gases used at the factory. Calibration gases with other oxygen concentrations are acceptable. If using different calibration gas values, you must do some additional configuration through the transmitter. Emerson does not recommend pure nitrogen as a calibration gas. Use a two-stage pressure regulator to establish a pressure of 20 psig (137.9 kPa) from the bottles and set the flowmeter to 5 scfh (2.5 L/min) flow rate.

5.1 Calibrate

Intiate probe calibration from the remote transmitter. The transmitter display prompts you with the calibration instructions.

Procedure

1. Press the **x1** or **x2** menu button on the transmitter display to enter the probe.
2. Navigate, using **Up** and **Down** buttons to Setup; press **Enter**.
3. Navigate to Cal Gas values; press **Enter**.
4. Navigate to Cal Gas 1 and press **Enter** twice to highlight the value setting.
5. Use the **Up** and **Down** buttons to set Cal Gas 1 value and **Left** and **Right** buttons to move to decimals setting.
6. After setting the correct value, press **Enter** and press **Left** to go to the ***Calibration Setup*** for Cal Gas 2, Gas time, and Purge time settings.
7. After setting the values, press **Left** to go up to the ***Calibration*** submenu.

   0.4 percent O_2, 8.0 percent O_2, and 300 seconds are the defaults.
8. Navigate using the **Up** and **Down** buttons to Calibration and press **Enter** to start.
9. Follow the instructions on the display, manually applying calibration gases to the calibration port.

   Emerson recommends applying 0.4 percent and 8.0 percent O_2 at 5 SCFH.
10. After the calibration is finished, press **Left** and use the **Up** and **Down** buttons the check the current and previous ten calibration logs.

After completing the procedure, the software calculates new calibration values and determines whether they meet an acceptance criteria. If successful, the new calibration values automatically replace the previous values. In the event the calibration values do not meet the accepted performance criteria, the existing calibration values remain in effect, and Emerson recommends replacing the probe.

⚠ CAUTION

Many combustion processes operate at a slight negative pressure (draft pressure) and can draw ambient air down the cal gas lines and into the sensing cell, causing a false elevated oxygen reading.The same phenomenon is possible if the calibration gas hoses become degraded or loose.

Ensure that you replace the calibration cap tightly after completing calibration.

5.2 Calibration record

Probe serial number:

Probe tag number:

Probe location:

Date placed into service:

Date	Slope	Constant	Impedance	$Response_{initial}$	$Response_{final}$

Note

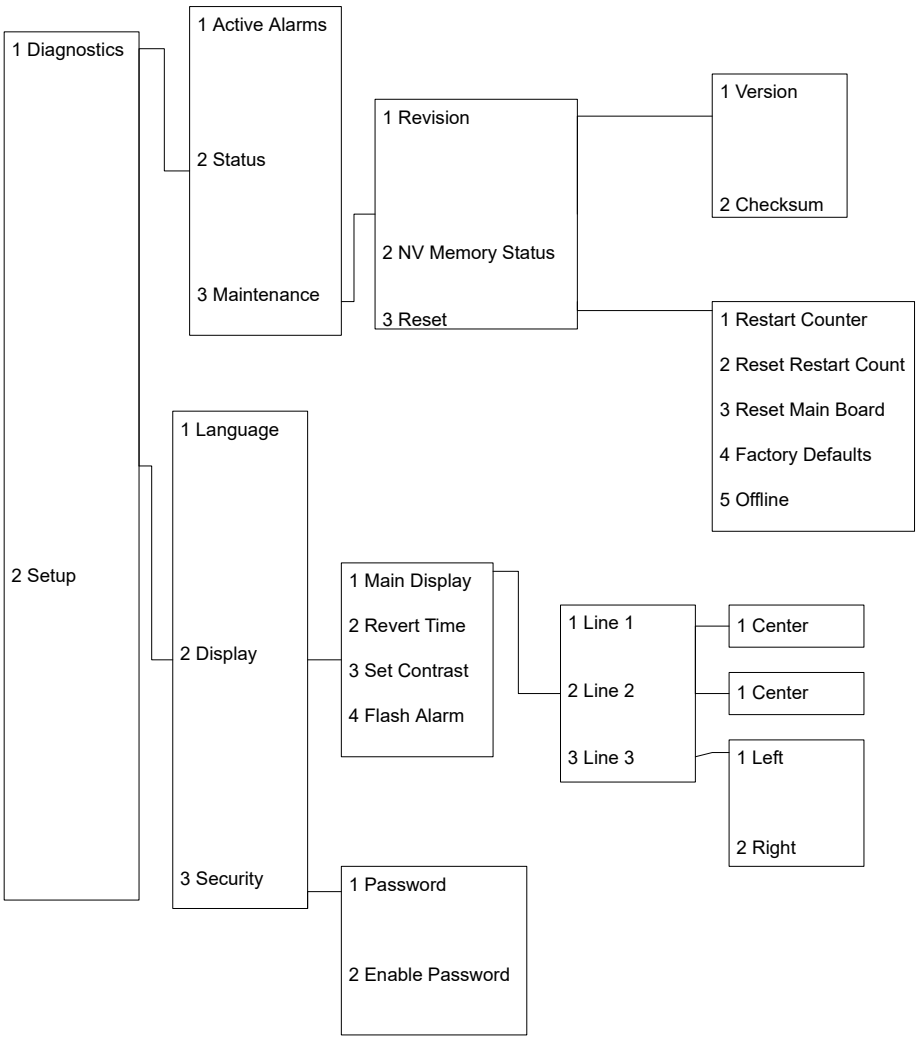
$Response_{initial}$: The time (in seconds) to observe the initial change in oxygen reading after closing the valve of the second calibration gas bottle.

$Response_{final}$: The time (in seconds) in which the oxygen reading returns to process oxygen concentration after closing the valve of the second calibration gas bottle.

6 Rosemount™ CX1100 In-Situ Oxygen Transmitter menu trees

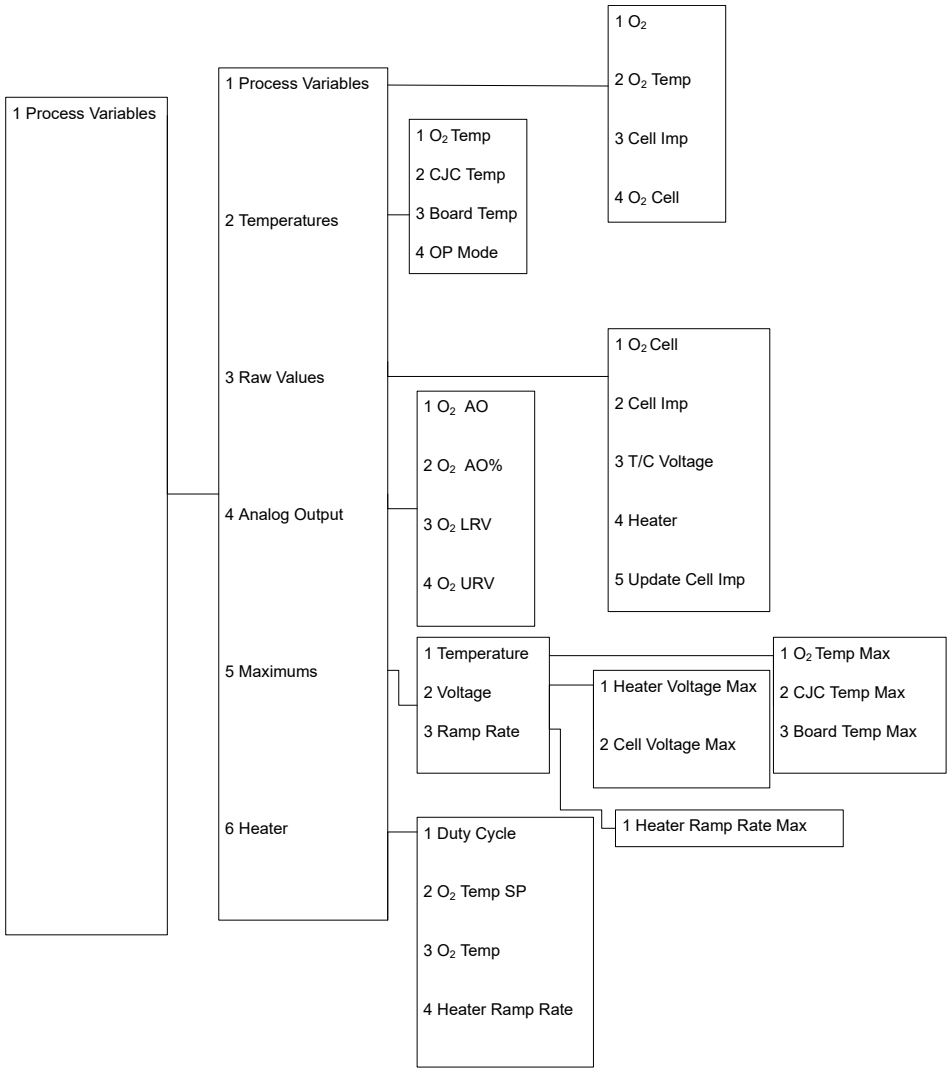
6.1 System menu tree

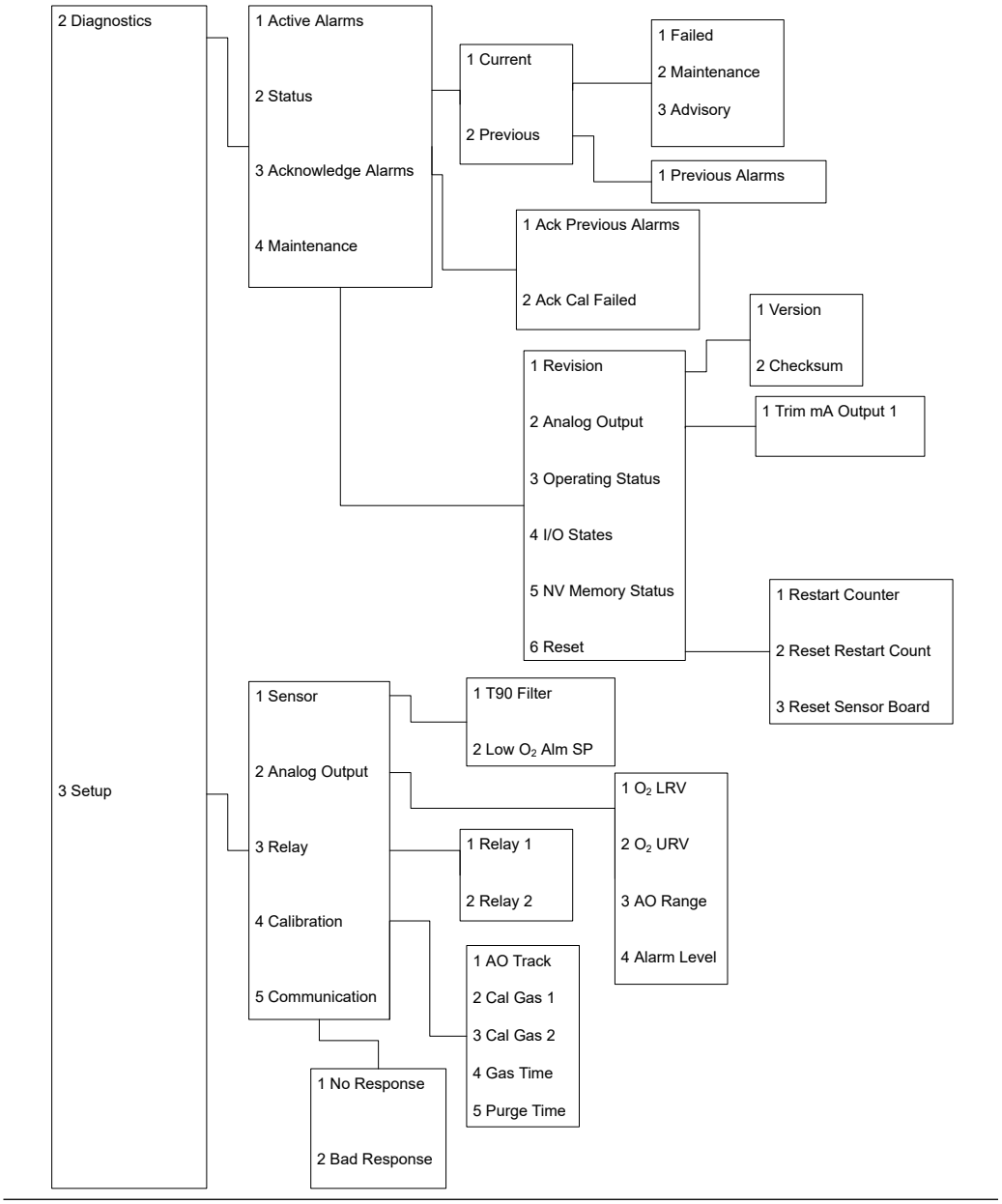
Figure 6-1: System Menu Tree



6.2 Probe menu tree

Figure 6-2: Probe Menu Tree




2 Diagnostics
1 Active Alarms
2 Status
3 Acknowledge Alarms
4 Maintenance
1 Current
2 Previous
1 Failed
2 Maintenance
3 Advisory
1 Previous Alarms
1 Ack Previous Alarms
2 Ack Cal Failed
1 Revision
2 Analog Output
3 Operating Status
4 I/O States
5 NV Memory Status
6 Reset
1 Version
2 Checksum
1 Trim mA Output 1
1 Restart Counter
2 Reset Restart Count
3 Reset Sensor Board
3 Setup
1 Sensor
2 Analog Output
3 Relay
4 Calibration
5 Communication
1 T90 Filter
2 Low O_2 Alm SP
1 O_2 LRV
2 O_2 URV
3 AO Range
4 Alarm Level
1 Relay 1
2 Relay 2
1 AO Track
2 Cal Gas 1
3 Cal Gas 2
4 Gas Time
5 Purge Time
1 No Response
2 Bad Response

7 Parameters

7.1 System and probe parameters

Table 7-1: System Parameters

Parameter label	Description
Active Alarms	Alarms
Status	Alarm status bits
Version	Main board software version number
Checksum	Main board software checksum
Restart Counter	Main board restarted counter
Offline	The number of times the sensor board is disconnected from the main board since last power up
Language	Supported languages
Line 1 | Center	Main display Line 1 data
Line 2 | Center	Main display Line 2 data
Line 3 | Left	Main display Line 3 left hand side data
Line 3 | Right	Main display Line 3 right hand side data
Revert time	The time set for the display to revert back to the main display after the period of time with no button press (2-9999 min)
Contrast	Display contrast (110 - 200)
Flash Alarm	Turn off/on the main display flashing when alarms detected. (No/Yes)
Password	User password: 4 numeric digits. (0 - 9999)
Enable Password	Disable/Enable password protection. (No/Yes)
NV Memory Status	Main board nonvolatile data memory diagnostic.

Table 7-2: Probe Parameters

Parameter label	Description
O_2	Current oxygen concentration value
O_2 Temp	Current O_2 sensor temperature
Cell Imp	Cell impedance/sensor resistance measured
O_2 Cell	Raw voltage value for ZrO_2 sensor
CJC Temp	Current cold junction temperature
Board Temp	Current electronics temperature measured at the sensor board
OP Mode	Device operating mode
T/C Voltage	O_2 T/C voltage

Table 7-2: Probe Parameters *(continued)*

Parameter label	Description
Heater	Heater voltage
O_2 AO	Analog ouput value represents the O_2 concentration measurement
O2 AO%	Analog output percentage for O_2 AO
O_2 Temp Max	This is the highest O_2 sensor temperature reached since last reset.
CJC Temp Max	This is the highest temperature reached at the cold junction since last reset.
Board Temp Max	This is the highest temperature reached at the sensor board since last reset.
Heater Voltage Max	This is the highest heater voltage reached since last reset.
Cell Voltage Max	This is the highest cell voltage reached since last reset.
Heater Ramp Rate Max	This is the highest heater ramp rate reached since last reset.
Duty Cycle	PID temperature set point
O_2 Temp Sp	Current O_2 sensor temperature
Active Alarms	Current alarms
Failed	Alarm status
Maintenance	Alarm status
Advisory	Alarm status
Previous Alarms	Previous alarms
Operating Status	Operating status
I/O States	I/O state
Version	Sensor board software version number
Checksum	Sensor board software checksum
NV Memory Status	Sensor board nonvolatile data memory diagnostic
Restart Counter	Sensor board software restarts counter.
T90 Filter	Analog output T90 time. It represents the time to take a step change in oxygen to reach 90% of the final value at the filter output. (0-300 sec)
Low O_2 Alm SP	Low O_2 alarm threshold (0.0 - 50.0%)
O_2 LRV	Primary variable, O_2%, lower range value. (0.0% only)
O_2 URV	Primary variable, O_2% upper range value (1.0% - 50.0%)
AO Range	Analog ouput polarity
Alarm Level	O_2 alarm level

Table 7-2: Probe Parameters *(continued)*

Parameter label	Description
Relay 1	Alarm Relay 1 mode
Relay 2	Alarm Relay 2 mode
AO Track	Analog output track O_2 sensor measurement during a calibration
Cal Gas 1	Test Gas 1 value. This is the actual value of the gas being applied during the Test Gas 1 phase of a calibration. (0.05 - 50.0%)
Cal Gas 2	Test Gas 2 value. this is the actual value of the gas being applied during the Test Gas 2 phase of calibration. (0.05 - 50.0%)
Gas Time	Test gas application time. This is the length of time test gases are applied to the O_2 probe during low or high test gas phase of a calibration. (60 - 1200 sec)
Purge Time	Test gas purge time. This is the length of time before the output will be returned to the process reading after a calibration. (60 - 1200 sec)
Imp Check Hold	Time to hold analog output during impedance check. (0 - 60 sec) *(Factory* mode only)
Remote CJC	Use local or remote CJC measurement for correction. (No/Yes) (*Factory* mode only)
Raw Counts | Cell Voltage	O_2 sensor voltage raw counts. (*Factory* mode only)
Raw Counts | Cell Imp	Cell impedance/sensor resistance raw counts. (*Factory* mode only)
Raw Counts | T/C Voltage	O_2 T/C raw counts. (*Factory* mode only)
Raw Counts | Heater Voltage	Heater voltage raw counts. (*Factory* mode only)
Cal State	This represents the state of the calibration cycle it is in.
Time Remain	Time remaining in the present calibration cycle state.
Slope	Current calibration slope. This is the slope value that was calculated as a result of the last successful calibration. (34.5 to 57.5 mV/Dec)
Constant	Current calibration constant. This is the constant value that was calculated as a result of the last successful calibration. (−20.0 to 20.0 mV)
Impedance	Cell impedance. This is the sensor resistance that was calculated as a result of the last successful calibration.
Time	Time stamp of the last successful calibration
Calibration Log | Slope	Previous calibration slope. There are ten calibration results. 1 is the most recent, and 10 is the least recent calibration slope.

Table 7-2: Probe Parameters *(continued)*

Parameter label	Description
Calibration Log | Constant	Previous calibration constant. there are ten calibration results. `1` is the most recent, and `10` is the least recent calibration constant.
Calibration Log | Impedance	Previous cell impedance. This is the sensor resistance that was calculated as a result of previous successful calibration. There are ten calibration results. `Index 1` is the most recent, and `Index 10` is the least recent sensor resistance measured.
Calibration Log | Log Time	Time stamp of the previous successful calibration. There are ten calibration time stamps. `Index 1` is the most recent, and `Index 10` is the least recent time stamp.
Cal Result	Calibration result

7.2 Rosemount™ CX1100 In-Situ Oxygen Transmitter system alarms

Table 7-3: System Alarms

Alarm label	Help messages and recommended actions
NV Memory Fail	Checksum error was detected in the nonvolatile memory configuration data when the unit was turned on. Default values have been loaded. Check to see that your configurations have not been changed. Cycle the power to clear alarm.
SB Disconnect	Communication failure detected between the sensor board and the main board, indicating the sensor board has been disconnected from the main board.Check the connecting cable pins.
SB Mismatch	The sensor type does not match, indicating wrong sensor board is connected.
SB Version	The sensor board software version does not match the expected version, indicating the sensor board software needs to be upgraded. Place the jumper on J1 of the sensor board and cycle the power to start the sensor board software upgrade.
SB Bootload Mode	The Bootload Mode jumper at J1 of the sensor board is on at power up. This mode should only be used to upgrade the sensor board software. Remove the jumper from J1 of the sensor board and cycle the power to clear the alarm.

Table 7-4: Probe Alarms

Alarm label	Help messages and recommended actions
O_2 T/C Reversed	The sensor heater thermocouple voltage is reading a negative voltage, indicating the thermocouple wire connections may be reversed. Check wiring.

Table 7-4: Probe Alarms *(continued)*

Alarm label	Help messages and recommended actions
NV Memory Fail	Checksum error was detected in the nonvolatile memory configuration data when the unit was turned on. Default values have been loaded. Check to see that your configurations have not been changed. Cycle the power to clear alarm.
Board Temp High	The electronics board tempreature reading is above the threshold. The board may not function correctly.
Factory Mode	The **Factory Mode** switch is set to On at power up. This mode should only be uses for factory setup. Turn off the **Factory Mode** switch and cycle the power to clear alarm.
Program Integrity	Software checksum error detected when the unit was turned on. Please replace sensor board.
O_2 T/C Shorted	This diagnostic is only intended to detect a copper short of the thermocouple connections at the electronics connector. The cell heater T/C voltage is reading close to zero, indicating the thermocouple wires may be shorted.
O_2 Sensor Open	The cell impedance voltage is reading out of normal range, indicating the sensor wires may be disconnected or the sensor junction may be open. Check wiring.
O_2 T/C Open	The sensor heater thermocouple voltage is out of range, indicating the T/C wires may be disconnected, or the T/C junction may be open. Check wiring.
O_2 Temp Low	The sensor heater temperature is below the low temperature threshold.
O_2 Temp High	The sensor heater temperature is above the high temperature threshold.
RTD Open	The CJC temperature is out of range, indicating the RTD may be open. Check RTD wiring.
Cal Failed	Calibration has failed. Check the Cal Result for more details. Acknowledge `Calibration Failed` or recalibrate to clear alarm.
Low O_2	The O_2 reading is below the threshold. The threshold is defined by the "Low O_2 Alm SP".

A Product certifications

See the Rosemount Product Certifications document for detailed information on the existing approvals and certifications.

A.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/Rosemount.

A.2 Ordinary location certification

As standard, the device 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).

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