Quick Start Guide
00825-0100-4890, Rev AC
October 2022

Rosemount™ 6888A

In Situ Oxygen Analyzer

ROSEMOUNT™

EMERSON.

Safety instructions

⚠ WARNING

Follow installation guidelines.

Failure to follow these installation guidelines could result in death or serious injury. If this 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.
- Install equipment as specified in this document.
- Ensure that 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 Emerson representative for clarification.

⚠ WARNING

Explosions

Do not open when an explosive atmosphere may be present.

⚠ WARNING

Electrical shock

Do not open while energized.

⚠ 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 to 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 the standard housing probe and direct replacement probe, only use supply cables and certified cable glands rated >105 °C.
- For the autocalibration housing, only use supply cables and certified cable glands rated > 85 °C.

NOTICE

Use only factory documented components for repair. Tampering or unauthorized substitution of parts and procedures can affect the performance and cause unsafe operation of your process.

NOTICE

The Field Communicator must be upgraded to System Software 2.0 with graphic license for operation with the Rosemount 6888A Analyzer. The AMS software must be upgraded to AMS 8.0 or above. Contact Emerson's Global Service Center (GSC) at +1-800-833-8314 to upgrade the Field Communicator software to System Software 2.0 with graphic license.

Symbols


Earth (ground) terminal


Protective conductor terminal


Risk of electrical shock


Refer to reference manual.

Contents

1 Installation

⚠ CAUTION

Equipment damage

If external loop power is used, the power supply must be a safety extra low voltage (SELV) type.

1.1 Install probe

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, a *weld plate* for welding to the flue gas duct can be supplied.

⚠ 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.

⚠ WARNING

Hazardous areas

The analyzer can be installed in general purpose areas only.

Do not install the analyzer in hazardous areas or in the vicinity of flammable liquids.

Procedure

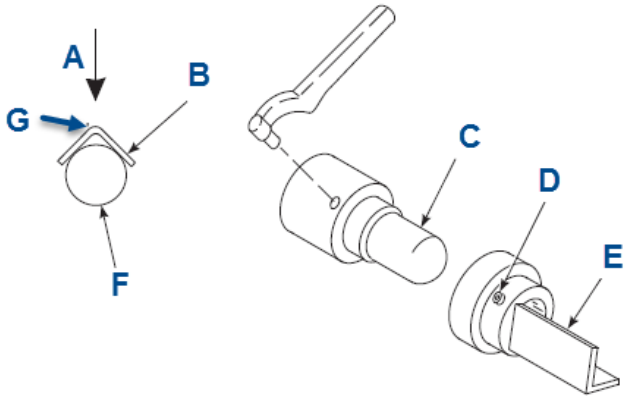
1. Ensure all components are available to install the probe.

   If using the optional ceramic or Hastelloy diffusion element, make sure to orient the vee deflector correctly.

2. Before inserting the probe, check the direction of gas flow in the duct. Orient the vee deflector so the apex points upstream toward the flow.

   See Figure 1-1.

Figure 1-1: Orienting the optional vee deflector



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

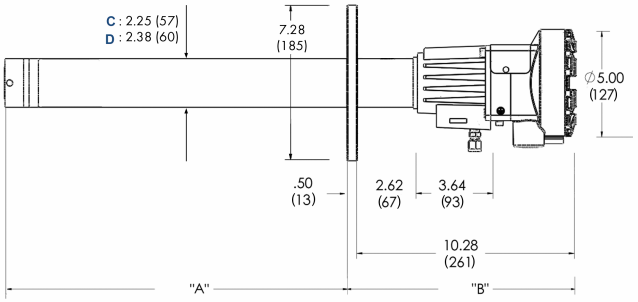
3. If using the standard square weld plate or an optional flange mounting plate, weld or bolt the plate onto the duct.

   The through hole diameter in the stack or duct wall and refractory material must be at least 2.5 in (64 mm).

NOTICE

Emerson recommends an abrasion-resistant probe tube or traditional abrasive shield for high velocity particulates in the flue stream (such as those in coal -fired boilers, kilns, and recovery boilers). Vertical and horizontal brace clamps are provided for 9 ft (2.74 m) through 12 ft (3.66 m) probes to provide mechanical support for the probe.

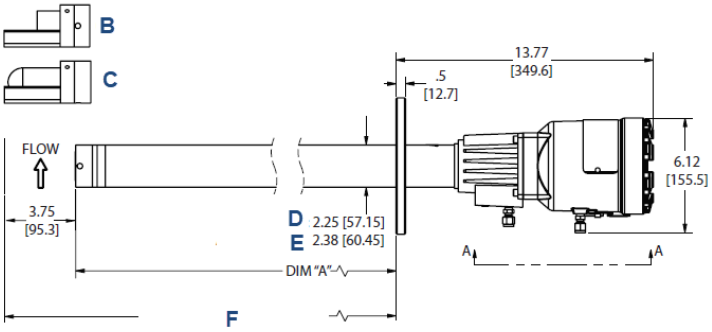
Figure 1-2: Rosemount 6888A probe with standard terminations/ electronic housing



A. *Dimension (see Table 1-1)*
B. *Dimension (see Table 1-1)*
C. *Standard tube*
D. *Abrasion resistant tube*

Note
All dimensions are in inches with millimeters in parentheses.

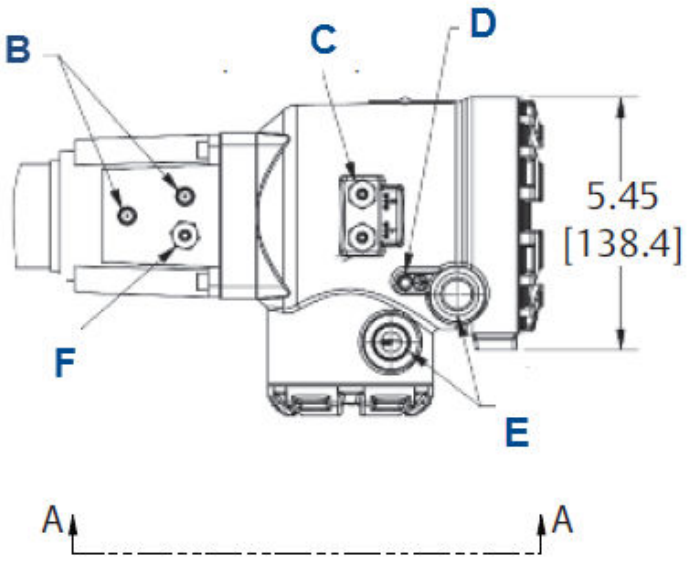
Figure 1-3: Rosemount 6888A integral autocalibration housing



A. Dimension (see Table 1-1)
B. Hastelloy diffuser
C. Ceramic diffuser
D. Standard tube
E. Abrasion tube
F. Minimum removal length

Note
All dimensions are in inches with millimeters in parentheses.

Figure 1-4: Rosemount 6888A integral autocalibration housing close-up



A. *Dimension (see Table 1-1)*
B. *Reference air vents*
C. *Calibration gas ¼-in tube fittings 5.0 scfh (2.4 L/min) 20 psig (1.38 barg)*
D. *#10 socket head cap screw (external ground)*
E. *½-in. NPT conduit connection (power, signal)*
F. *Reference gas ¼-in. tube fitting 2.0 scfh (1.0 L/min) 20 psig (1.38 barg)*

Note
All dimensions are in inches with millimeters in parentheses.

Table 1-1: Insertion and removal dimensions

Probe length(1)	Dimension A insertion depth	Dimension B removal envelope standard housing	Dimension B removal envelope accessory housing
18 in (457 mm) probe	16.1 in (409 mm)	15.77 in (400.6 mm)	19.26 in (489.2 mm)
3 ft (0.91 m) probe	33.52 in (851.4 mm)	46.6 in (1,184 mm)	50.1 in (1,273 mm)
6 ft (1.83 m) probe	68.52 in (1,740.4 mm)	82.6 in (2,098 mm)	86.1 in (2,187 mm)

Table 1-1: Insertion and removal dimensions *(continued)*

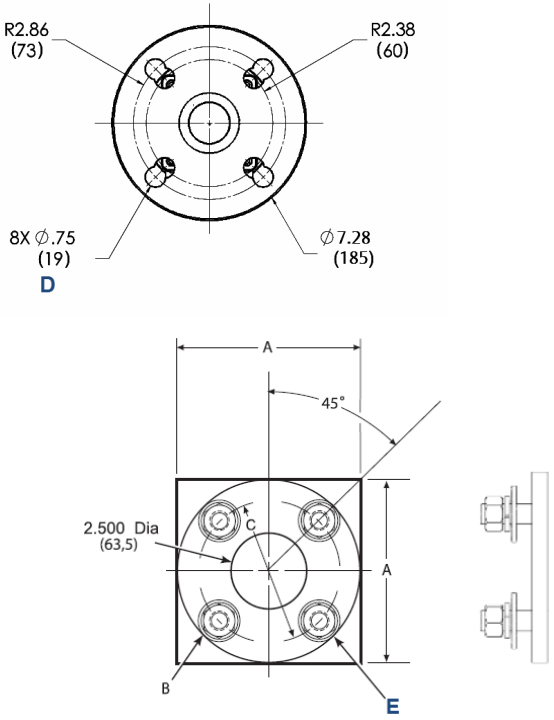
Probe length(1)	Dimension A insertion depth	Dimension B removal envelope standard housing	Dimension B removal envelope accessory housing
9 ft (2.74 m) probe	104.52 in (2,654.8 mm)	118.6 in (3,012 mm)	122.1 in (3,101 mm)
12 ft (3.66 m) probe	140.52 in (3,569.2 mm)	154.6 in (3,927 mm)	158.1 in (4,016 mm)

(1) Add 3.8 in (97 mm) to Dimension A and Dimension B for probe with ceramic or Hastelloy diffuser.

The through hole diameter in the stack or duct wall and refractory material must be at least 2.5 in (64 mm).

4. Insert probe through the opening in the mounting flange and bolt the unit to the flange.

Figure 1-5: Probe installation



A. *Dimension (see Table 1-3)*
B. *Thread dimension (see Table 1-3)*
C. *Diameter (see Table 1-3)*
D. *Equally spaced*
E. *Four studs, lockwashers, and nuts equally spaced on C, diameter B C*

Note
All dimensions are in inches with millimeters in parentheses.

Table 1-2: Mounting flange

	ANSI	DIN
Flange diameter	7.28 in (184.9 mm)	
Hole diameter	0.75 in (19.0 mm)	

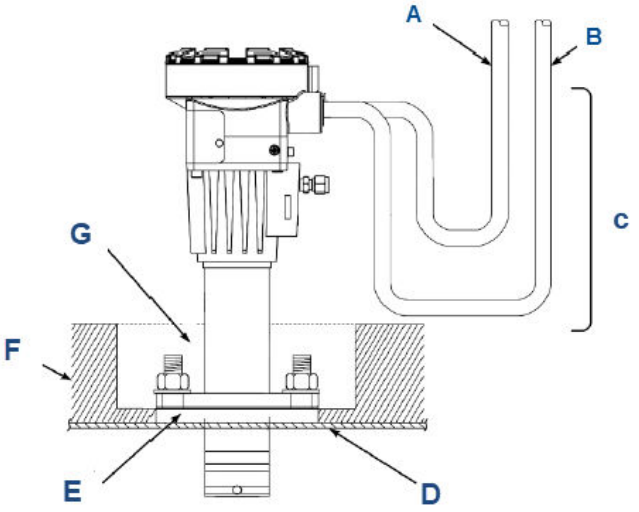
Table 1-2: Mounting flange *(continued)*

	ANSI	DIN
(4) holes equally spaced on BC	4.75 in (120.6 mm)	5.71 in (145.0 mm)

Table 1-3: Installation weld plate outline

Dimension	ANSI	DIN
A	152 in (3,861 mm)	191 in (4,851 mm)
B thread	11 in (279 mm)	M16x2
C diameter	121 in (3,073 mm)	145 in (3,683 mm)

Figure 1-6: Drip loop and insulation removal



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

Note
Standard housing probe shown. Accessory housing is similar. Probe installation may be vertical or horizontal.

1.2 Electrical installation

All wiring must conform to local and national codes. Multiple wiring diagrams are shown in this section. Always refer to the diagrams that apply to your transmitter configuration and disregard all other wiring diagrams.

⚠ WARNING

Electrical shock

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

Disconnect and lock out power before connecting the power supply.

Install all protective covers and ground leads after installation.

To meet the safety requirements of IEC 61010-1 (EC requirement) 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 located close by. Circuit breakers or switches must comply with a recognized standard, such as IEC 947.

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

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

1.2.1 Wire Rosemount 6888A Analyzer probe only (no Rosemount 6888Xi Electronics)

The Rosemount 6888A Analyzer probe has electronics in the blue housing that controls the heater temperature and also amplifies the raw O_2 milli-volt signal to a linear 4-20 mA. You can run the 4-20 mA signal lines directly to the control room and also power the analyzer electronics. There is no O_2 display or keypad on the probe, so you must set up the analyzer through HART® communications using a hand-held communicator or Asset Management Solutions (AMS) software.

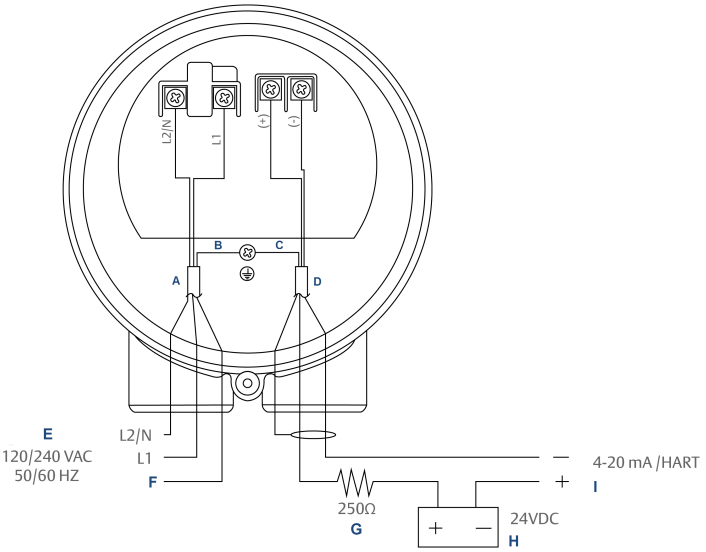
Procedure

1. Remove the cover from the probe.

2. Connect the line (**L1** wire) to the **L1** terminal, the neutral (**L2** wire) to the **L2/N** terminal, and the ground wire to the ground lug.

   The analyzer accepts 120/240 Vac ±10 percent line voltage and 50/60 Hz. No setup is required.

Figure 1-7: Rosemount 6888A standard probe housing



A. AC input
B. Ground
C. Shield
D. 4-20 mA HART
E. AC input
F. Ground
G. Resistor
H. Power supply
I. Output to DCS

3. Connect the 4-20 mA signal wires at the analyzer. Use a shielded twisted wire pair.

   Do not allow bare shield wires to contact the circuit boards. Insulate the shield wires prior to termination. The analyzer electronics are loop-powered, meaning that the 4-20 mA signal wires supply 24 VDC from the DCS or an external power supply.

4. Terminate the shield only at the analyzer electronics housing unless using a Rosemount 6888Xi. When using the Rosemount 6888 Xi Advanced Electronics, terminate the shield at both ends.

NOTICE

The 4-20 mA signal represents the O_2 value and also powers the probe-mounted electronics. Superimposed on the 4-20 mA signal is HART information accessible through a Field Communicator or AMS software.

5. Reinstall cover on analyzer.

Postrequisites

Follow the instructions in the following sections only if a Rosemount 6888Xi is included with your system configuration.

1.2.2 Wire standard housing analyzer probe plus Rosemount 6888Xi Electronics

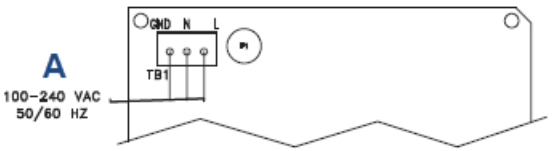
The Rosemount 6888Xi Electronics serve as an operator interface unit with a back-lit display and keypad. It is capable of two channels, serving two Rosemount 6888A probes.

Procedure

1. Remove cover screws from the front cover of the Rosemount 6888Xi. Swing down the front cover of the interface box.
2. Pull out the input/output (IO) board on the right side of the card rack inside the Rosemount 6888Xi.

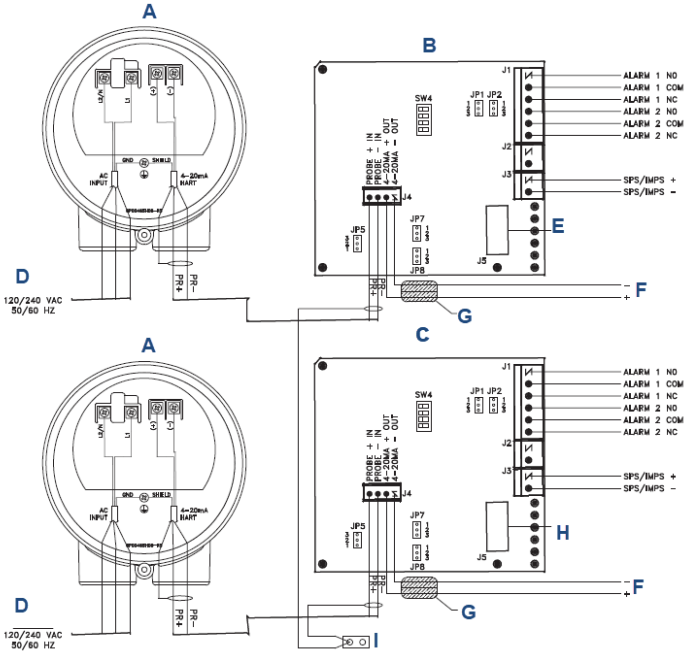
   If your system is configured to operate two analyzer probes, there are two IO interface boards.

Figure 1-8: Power supply board



A. AC input

Figure 1-9: IO boards



A. Rosemount 6888A standard probe housing
B. IO board - channel 1
C. IO board - channel 2
D. AC input
*E. Ribbon cable to display board **J2**, Sensor 1*
F. 4-20 mA output
G. Ferrite clamp
*H. Ribbon cable to display board **J3**, Sensor 2*
I. Shield ground

Table 1-4: Channel 1 jumper settings

Jumpers	Settings
JP1	Pins 2-3
JP2	Pins 2-3
JP3	Pins 1-2, internal power Pins 2-3, external power
JP7	Pins 1-2, internal power Pins 2-3, external power

Table 1-4: Channel 1 jumper settings *(continued)*

Jumpers	Settings
JP8	Pins 1-2, internal power Pins 2-3, external power

Table 1-5: Channel 1 SW4 switch settings

Position	Setting
1	Off
2	Off
3	Off
4	Off

Table 1-6: Channel 2 jumper settings

Jumper	Setting
JP1	Pins 1-2
JP2	Pins 1-2
JP5	Pins 1-2, internal power Pins 2-3, external power
JP7	Pins 1-2, internal power Pins 2-3, external power
JP8	Pins 1-2, internal power Pins 2-3, external power

Table 1-7: Channel 2 SW4 switch settings

Position	Setting
1	Off
2	Off
3	Off
4	Off

Note

a. Except for **JP5**, **JP2**, and **JP8** on the IO board, jumper and switch settings are factory set and are shown for reference only.

b. IO board 4-20 mA/HART loop power settings:

JP5: Pins 1-2 internal power Rosemount 6888Xi to Rosemount 6888A Analyzer, pins 2-3 external power Rosemount 6888Xi to Rosemount 6888A Analyzer (requires 2500 resistor across **J4**, PR+ to PR-)

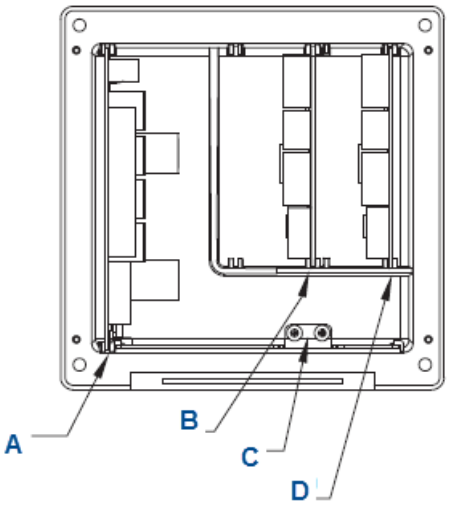
JP7/JP8: Pins 1-2 internal power Rosemount 6888Xi to DCS, pins 2-3 external power Rosemount 6888Xi to DCS.

Compare Table 1-8 to the model number on the probe tag to confirm the features present in this specific probe.

Table 1-8: Remote type ordering information

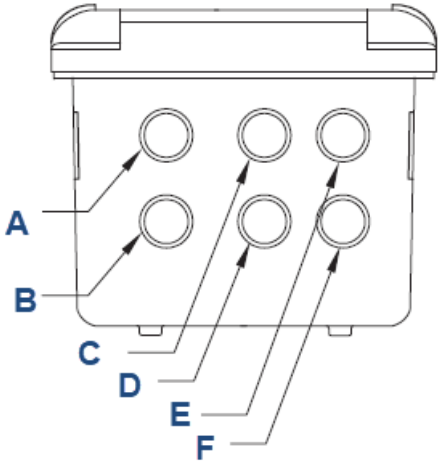
Model code	Description
1OXY	Single channel O_2
2OXY	Single channel O_2 with flame safety interlocking heater
3OXY	Dual channel O_2
4OXY	Single channel O_2 traditional architecture for 120 V probes

Figure 1-10: Rosemount 6888Xi front view



A. Power supply board
B. Channel #2 IO board
C. Shield ground
D. Channel #1 IO board

Figure 1-11: Rosemount 6888Xi bottom view



A. AC input to power supply
B. Plug
C. Channel #2 alarm relay, Rosemount SPS
D. Channel #2 4-20 mA/HART output
E. Channel #1 alarm relay, Rosemount SPS
F. Channel #1 4-20 mA/HART output

3. Connect the 4-20 mA signal wires at **J4** of the IO board. Attach the supplied ferrite clamp over the 4-20 mA out wires that extend past the shield.

NOTICE

Installation of the ferrite clamp over the 4-20 mA out wires is required for the compliance with the European EMC directive.

4. Terminate the shield of the 4-20 mA signal wires at the designated ground terminal of the Rosemount 6888Xi. Do not allow bare shield wires to contact the circuit boards. Insulate the shield wires prior to termination.
5. Connect the signal wires from the Rosemount SPS (if used) to the applicable terminals of **J3**.

   Refer to the Rosemount SPS 4001B Manual for wiring details.
6. Reinstall the IO board in the card rack of the Rosemount 6888Xi.

7. If your system is configured or two channel operation, repeat Step 2 through Step 6 to connect the other probe's signal wires.
8. Remove the probe's connector from the power supply board located on the left side of the card rack inside the Rosemount 6888Xi.
9. Connect the line, or **L1**, wire to the **L1** terminal and the neutral, or **L2**, wire to the **N** terminal.
10. Reinstall the power supply connector in the power supply board.

1.2.3 Wire analyzer probe with integral autocalibration and HART® communications

You can initiate a calibration in one of the following ways:

- Automatically with a calibration recommended diagnostic
- Automatically by time since last calibration
- Manually with external dry contact
- Manually with HART communications
- Manually with the Rosemount 6888Xi local operator interface keypad

Note
You can only implement the integral autocalibration feature when using the probe with the Rosemount 6888Xi Advanced Electronics

Procedure

1. Remove the two covers from the analyzer.
2. Connect the line (**L1** wire) to the **L1** terminal, the neutral (**L2**) wire to the **L2/N** terminal, and the ground wire to the ground lug.

   The Rosemount 6888A accepts line voltage at 120/240 Vac ±10 percent, 50/60 Hz. No setup is required.
3. Connect the 4-20 mA signal wires from the Rosemount 6888Xi to the connections in the side chamber of the analyzer.

   Do not connect the signal wires to the terminals in the main chamber where the AC input wires are connected. Use a shielded twisted wire pair.

   NOTICE

   Do not allow bare shield wires to contact the circuit boards. Insulate the shield wires prior to termination.

   The 24 VDC loop power is sourced from the Rosemount 6888Xi.

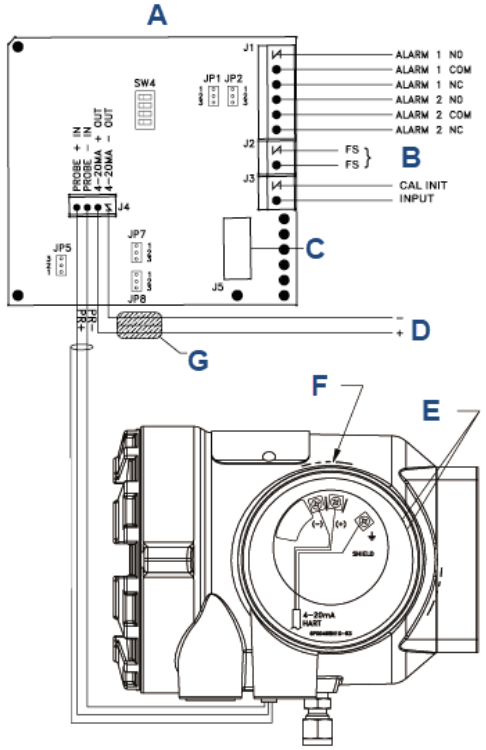
4. Terminate the shield at both the probe and the Rosemount 6888Xi Advanced Electronics.

NOTICE

The 4-20 mA signal represents the O_2 value and also powers the probe-mounted electronics. Superimposed on the 4-20 mA signal is HART information accessible through a Field Communicator or Asset Management Solutions (AMS) software.

5. Reinstall both covers on the analyzer.
6. Follow the remaining electrical installation instructions for the Rosemount 6888Xi included with your system configuration.

Figure 1-12: Input/output (IO) board connections



A. IO board, Channel 1
B. Optional
*C. Ribbon cable to display board **J2**, Sensor 1*
D. 4-20 mA HART output
E. Test points
F. Signal
G. Ferrite clamp

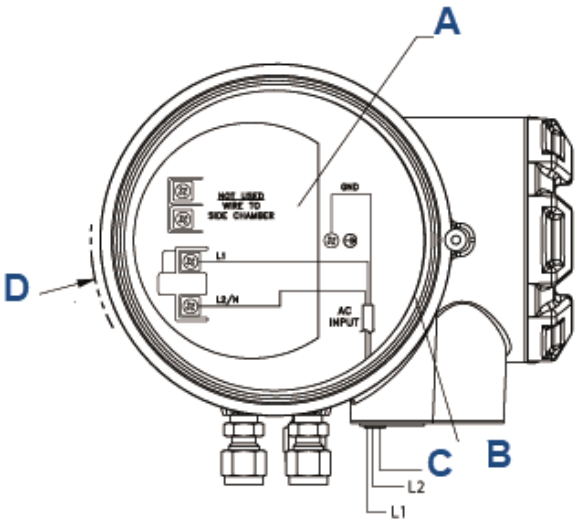
Table 1-9: IO board jumper settings

Jumper	Setting
JP1	Pins 2-3
JP2	Pins 2-3
JP5	Pins 1-2, internal power Pins 2-3, external power

Table 1-9: IO board jumper settings *(continued)*

Jumper	Setting
JP7	Pins 1-2, internal power Pins 2-3, external power
JP8	Pins 1-2, internal power Pins 2-3, external power

Figure 1-13: Analyzer probe field connections



A. Test point group
B. #8 pan heated screen (internal ground)
C. Ground
D. Power

See Figure 1-10 and Figure 1-11.

1.2.4 Wire analyzer probe with integral autocalibration and FOUNDATION™ Fieldbus communications

This probe contains gas-switching solenoids so that the Rosemount 6888Xi Advanced Electronics can control the introduction of calibration gases.

You can manually initiate calibrations in the following ways:

- Calibration recommended diagnostic
- Time since last calibration

- External dry contact
- FOUNDATION® Fieldbus communications
- Rosemount 6888Xi local operator interface (LOI) keypad

You can only implement the integral autocalibration feature when using the probe with a Rosemount 6888Xi.

Procedure

1. Remove the two covers from the analyzer.
2. Connect the line (**L1**) wire to the **L1** terminal, the neutral (**L2**) wire to the **L2/N** terminal, and the ground wire to the ground lug.

   The analyzer accepts 120/240 Vac ±10% line voltage and 50/60 Hz. No setup is required.
3. Connect the FOUNDATION Fieldbus wires from the Rosemount 6888 side housing to the FF segment.

   NOTICE

   The Rosemount 6888A probe is not rated as intrinsically safe (IS) and will render any IS or FISCO segment it is wired to as non-IS. Use a shielded twisted wire pair. Do not allow bare shield wires to contact the circuit boards.
4. Terminate the shield at both the probe and the Rosemount 6888Xi Advanced Electronics.

   NOTICE

   The FOUNDATION Fieldbus signal represents the O_2 value and also powers the probe-mounted electronics.
5. Reinstall both covers on analyzer.

Postrequisites

Follow the remaining electrical installation instructions for the Rosemount 6888Xi included with your system configuration.

1.2.5 Connect traditional architecture system to the direct replacement probe

Use a traditional architecture configuration to provide for remote location of the analyzer electronics. All electronics are housed inside the Rosemount 6888Xi. A multi-conductor power/signal cable connects the probe to the

Rosemount 6888Xi. Use the following procedure to connect the traditional architecture probe to the Rosemount 6888Xi.

NOTICE

The traditional architecture cable is provided at the specified length and is ready for installation. The cable glands must be properly terminated to maintain EMC/electromagnetic interference (EMI) noise protection.

Procedure

1. Run the seven-conductor cable between the traditional architecture probe and the installation site for the Rosemount 6888Xi.

   Use new cable conduit or trough as needed.

2. Install the cable and lead wires to the probe per manufacturer's instructions.
3. Install the cable at the probe housing and at the Rosemount 6888Xi enclosure.
   a) Unscrew locking nut from gland assembly and slide locking nut back along cable.
   b) Pull the gland body away from the plastic insert.

      NOTICE

      Use care not to damage the cable shield braid.

   c) Insert the cable wires into the proper entry port in either the probe housing or the Rosemount 6888Xi enclosure.
   d) At the probe housing, apply PTFE tape or similar sealing compound to the tapered pipe threads. Thread the gland body into the probe housing until properly seated.
   e) At the Rosemount 6888Xi enclosure, insert the gland body into the left front cable port from the inside of the enclosure. Use the rubber O-ring provided to seal the cable port.
   f) Ensure the cable shield braid is evenly formed over the gray insert.

      When properly formed, the braid should be evenly spaced around the circumference of the insert and not extend beyond the narrow diameter portion.

   g) Carefully press the gray insert into the gland body.

The grooves on the insert should align with similar grooves inside the gland body. Press the insert in until it bottoms out in the gland body.

h) Slide the locking nut up and thread it onto the gland body. Tighten the locking nut so the rubber grommet inside the plastic insert compresses against the cable wall to provide an environmental seal.

4. At the Rosemount 6888Xi, connect the cable leads to the connectors on the analyzer input/output (IO) board.

1.3 Pneumatic installation

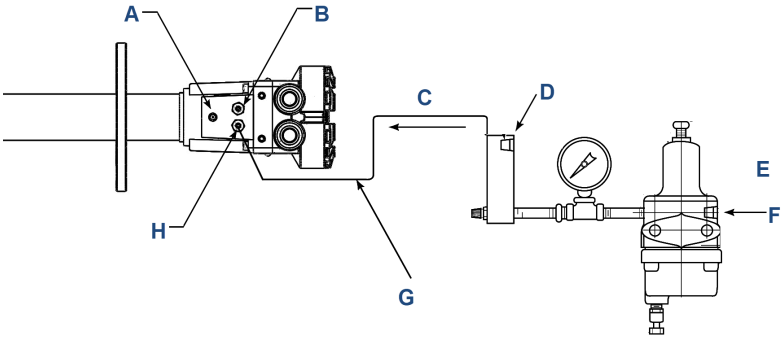
1.3.1 Reference air package

After the Rosemount 6888A is installed, connect the reference air set to the analyzer unit.

Refer to the schematic diagram in Figure 1-14 for a locally assembled reference air supply.

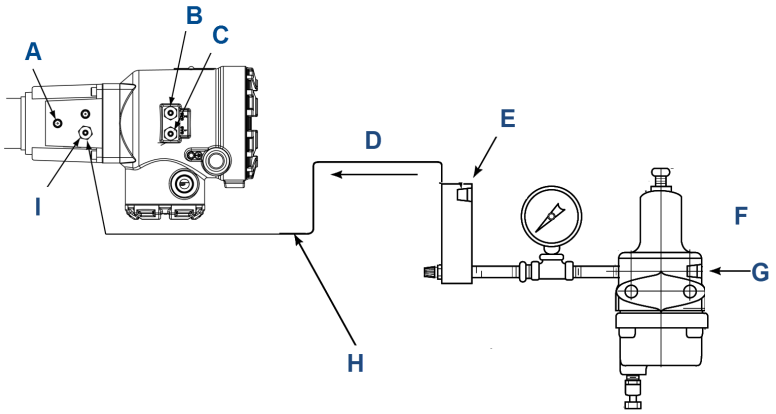
Instrument air (reference air): 5 psig (0.34 barg) minimum, 8 psig (0.55 barg) maximum at 2.0 scfh (1.01 L/min) maximum; less than 40 parts per million total hydrocarbons. Set regulator outlet pressure at 5 psig (0.34 barg). Use the reference air set or the optional Rosemount SPS 4001B to supply reference air.

Figure 1-14: Plant schematic diagram, standard housing



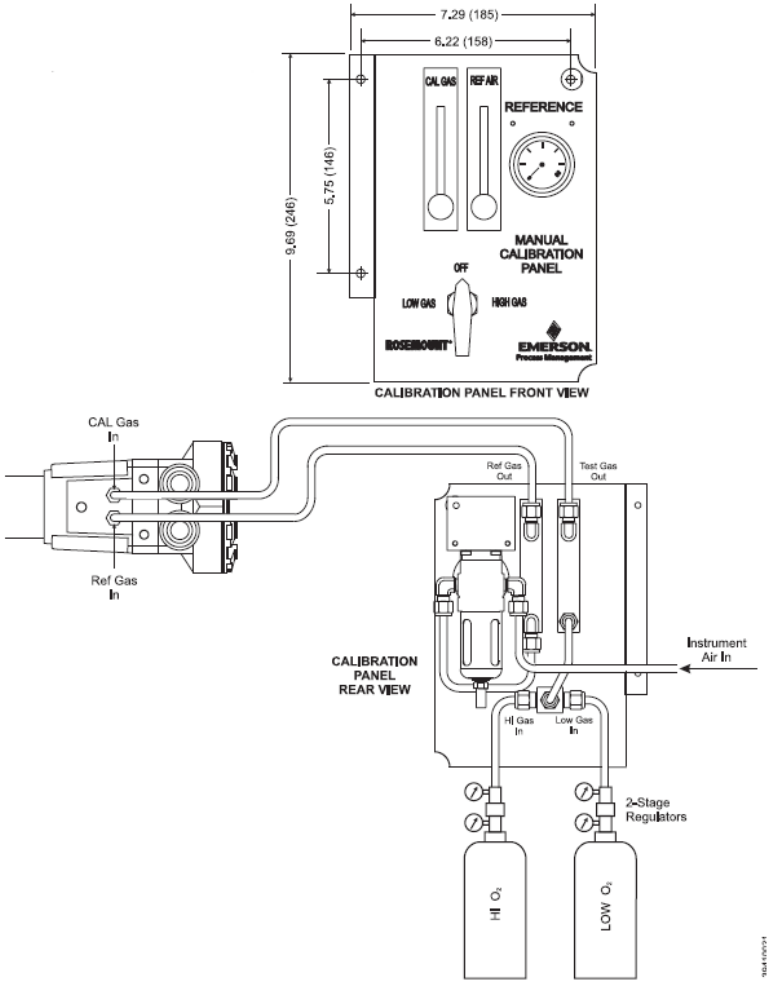
A. *Vent*
B. *Calibration gas: ¼-in. tube*
C. *To analyzer*
D. *Reference air flow meter*
E. *Instrument air supply: 10 psig (0.69 barg) to 80 psig (5.52 barg) pressure*
F. *¼-in.-18 NP female inlet connection*
G. *¼-in. or 6 mm O.D. tubing (supplied by customer)*
H. *Reference gas: ¼-in. tube*

Figure 1-15: Plant air schematic diagram, accessory housing



A. Vent
B. Calibration gas 1: ¼-in. tube
C. Calibration gas 2: ¼-in. tube
D. To analyzer
E. Reference air flow meter
F. Instrument air supply: 10 psig (0.69 barg) to 80 psig (5.52 barg) pressure
G. ¼-in.-18 NPT female inlet connection
H. ¼-in. or 6 mm O.D. tubing (supplied by customer)
I. Reference gas: ¼-in. tube

Figure 1-16: Manual calibration panel



Note
Dimensions are in inches with millimeters in parentheses.

Reference air components are included in the optional manual calibration panel (Figure 1-16) and the Rosemount SPS 4001 Single Probe Autocalibration Sequencer.

NOTICE

The optional Rosemount SPS 4001B Sequencer can only be used when the Rosemount 6888Xi Advanced Electronics option is selected. The Rosemount 6888Xi must be properly configured for autocalibration.

See the SPS 4001B Single Probe Autocalibration Sequencer Instruction Manual for wiring and pneumatic connections.

Related information

Configuration, start-up, and operation

1.3.2 Calibration gas

The analyzer uses two calibration gas concentrations: low gas (0.4 percent O_2, balance N_2) and high gas (8 percent O_2, balance N_2).

⚠ CAUTION

Failure to use proper gases will result in erroneous readings.

Do not use 100 percent nitrogen as a low gas (zero gas). We recommend 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.

⚠ CAUTION

Before washing down the ducts, verify that the Rosemount 6888A Analyzers have been powered down and removed from the wash areas.

⚠ CAUTION

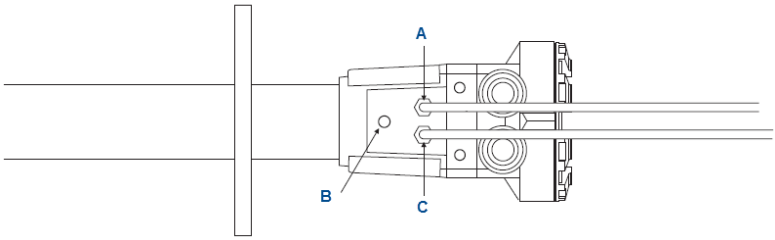
Damage can result from having a cold analyzer exposed to process gases.

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.

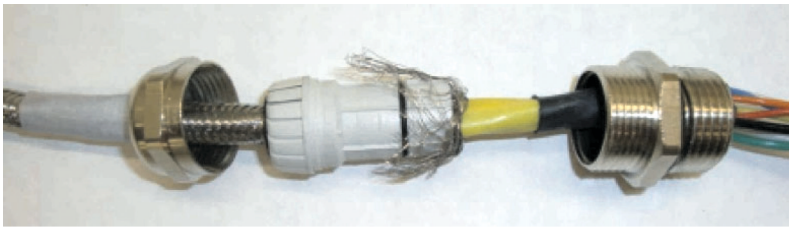
See Figure 1-17 for the calibration gas connections.

Figure 1-17: Calibration gas connections



A. Calibration gas in
B. Reference air vent
C. Reference air in

Figure 1-18: Traditional architecture cable gland assembly



2 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.

⚠ CAUTION

If external loop power is used, the power supply must be a safety extra low voltage (SELV) type.

2.1 Power up analyzer without Rosemount 6888Xi

Procedure

1. Apply AC line power to the analyzer.
2. Apply 24 VDC loop power to the analyzer.
3. Using either the DCS control or a Field Communicator, verify communications to the analyzer.

The analyzer probe takes approximately 45 minutes to warm up to the 1,357 °F (736 °C) heater set point. The 4-20 mA signal remains at a default value of 3.5 mA, and the O_2 reading remains at 0 percent through this 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, an alarm message is displayed.

2.2 Power up the Rosemount 6888A direct replacement probe (no electronics inside) with traditional architecture Rosemount 6888Xi

Procedure

1. Apply AC line power to the Rosemount 6888Xi.
2. Run the Quick Start Wizard as described in Run Rosemount 6888Xi Quick Start Wizard.
3. At the ***Auto Cal Device*** screen, select None, SPS, or IMPS as appropriate.

   Do not select Integral or calibration will not be possible.

The analyzer probe takes approximately 45 minutes to warm up to the 1,357 °F (736 °C) heater set point. The 4-20 mA signal remains at a default value of 3.5 mA, and the O_2 reading remains at 0 percent through this 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 Rosemount 6888Xi displays an alarm message.

2.3 Run Rosemount 6888Xi Quick Start Wizard

When you first power up the Rosemount 6888Xi, a short wizard program guides you through the basic setup. Once configured, the Rosemount 6888Xi retains the setup, and the wizard will not repeat.

Procedure

1. Apply power to the Rosemount 6888Xi.
   Once the device powers on, the ***Quick Start Wizard*** screen appears. With a dual channel Rosemount 6888Xi, the wizard runs for both channels in succession.
2. Press **Enter** to continue.
3. On the ***Sensor Type*** screen, use the **Up** and **Down** keys to select O_2.

   Do not select CO, as this option is reserved for future use.
4. Press **Enter** to continue.
5. On the ***Device Type*** screen use the **Up** and **Down** keys to select HART® or FF (FOUNDATION™ Fieldbus), whichever applies.
6. At the ***Auto Cal Device*** screen, use the **Up** and **Down** keys to select the calibration method to be used. The methods are defined as follows:
   - None: Manual calibration with the standard probe housing configuration.
   - SPS: Automatic calibration with the standard probe housing configuration using the Rosemount SPS 4001B.
   - IMPS: Automatic calibration with the standard probe housing configuration using the Rosemount IMPS.
   - Integral: Automatic calibration with the integral autocal probe housing configuration.

7. Press **Enter** to continue.

   Note
   If you select SPS, IMPS, or Integral, you must still configure automatic calibration as On. Verify other parameters, such as test gas values and gas times, as well. Refer to the Rosemount 6888Xi Reference Manual for calibration setup details.

8. When prompted by `Setup Correct?`, use the **Up** and **Down** keys to select Yes.

   If you select No, the wizard restarts.

9. Press **Enter** to continue.

The Rosemount 6888Xi displays several screens while saving the configuration, resets itself, and then returns to the main screen.

2.4 Calibration

2.4.1 Manual/semi-automatic calibration

A technician can calibrate the Rosemount 6888A probe with standard housing by following prompts via the display of the Rosemount 6888Xi Electronics or via HART® communications to a Field Communicator or Asset Management Solutions (AMS) console.

Manually switch the gases based upon these prompts. We recommend using 0.4 percent O_2 and 8 percent O_2, balance nitrogen as calibration gases. Always use a two-stage pressure regulator set to 20 psig (1.38 barg). Set the calibration gas flow meter for a maximum of 5 scfh with the cal gas fitting removed from the probe. A diffuser/filter that is plugged over time may cause the flow meter to deliver less flow to the sensing cell, but never readjust the flow rate until a new diffuser is installed. Readjusting the flow meter back up to the 5 scfh level could pressurize the cell during calibration and cause the O_2 reading to shift downwards.

The electronics determine if the calibration was successful and calculate new calibration values. New calibration values are not automatically loaded into the electronics after a successful calibration, however. You have the choice to accept or reject the new values.

A significant calibration change may cause a bump in the O_2 readings at the DCS console, causing operator concern. Record the calibration data on a log (cell slope, constant, and impedance, as well as the speed of response data). If the electronics is used, it stores calibration data for the past ten 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.

2.4.2 Fully automatic calibration

For fully automatic calibration, the Rosemount 6888Xi Electronics must manage the actuation of solenoids to introduce gases into the probe.

Calibrate probes with standard electronics housing

In addition to the Rosemount 6888Xi, this arrangement requires a separate single probe sequencer (SPS), which is a solenoid box for switching calibration gases, or a larger intelligent multi-probe sequencer (IMPS), which can handle the auto-calibration for up to four probes in one box.

You can initiate automatic calibration in several ways:

- A calibration recommended diagnostic that is periodically checking cell impedance.
- Push button on the Rosemount 6888Xi.
- HART® communications from a hand-held communicator or AMS.
- An external contact closure.
- Time since the last successful calibration.

If the O_2 measurement is being used for automatic control, always place the O_2 control loop into manual prior to calibrating. Always inform the operator prior to calibrating. The Rosemount 6888Xi Electronics provides an in cal contact closure for this purpose. An initiate cal contact is also provided.

The Rosemount 6888Xi Electronics sequences the calibration gases in turn into the sensing cell. A 300 second flow time is the factory default for both gases and also for the purge cycle, which lets the probe signal come back to the normal flue gas readings. The 4-20 mA signal representing O_2 can be held during the calibration cycle or permitted to vary with the bottled gases, in which case a record of the calibration can be trended at the DCS.

Calibration setup is found under the detailed setup menu.

Calibrate probe with integral auto-calibration housing

This probe contains the auto-calibration solenoids within the blue electronics housing, eliminating the need and cost for a Rosemount SPS solenoid enclosure. Both calibration gases are permanently piped into two

ports on the probe. It's important to confirm that there are no piping leaks or the calibration bottles will leak down prematurely.

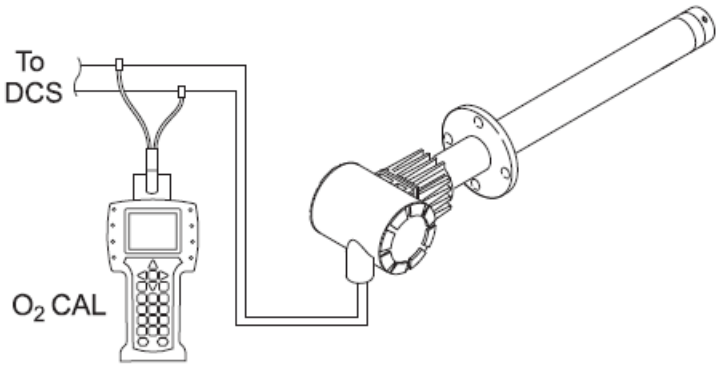
Note
The calibration sequence from the Rosemount 6888Xi electronics will be identical to that for manual/semiautomatic calibration, but with the integral auto-calibration version of this probe it is not possible to conduct a manual calibration. The factory offers a probe rebuild capacity if solenoid or other failures occur.

Note
Calibration gas bottles are piped and under pressure at all times, so be sure to leak-check all fittings, tubings, and connections. Always use dual-stage pressure regulators.

2.4.3 Calibrate manually

This section covers manual calibration. For automatic calibration details, see the Rosemount SPS 4001B Single Probe Autocalibration Sequencer Manual.

Figure 2-1: Simplified calibration method



Procedure

1. Use the Field Communicator to access the main HART® menu.
2. From the main menu, select CONFIGURE.
3. From the ***CONFIGURE*** menu, select CALIBRATION.
4. From the ***CALIBRATION*** menu, again select CALIBRATION.
5. From the ***CALIBRATION*** menu, select O_2 CALIBRATION.

⚠ WARNING

Failure to remove the Rosemount 6888A from automatic control loops prior to performing this procedure may result in a dangerous operating condition.

In the first screen, a `Loop should be removed from automatic control` warning occurs.

6. Remove the Rosemount 6888A from any automatic loop controls to avoid a potentially dangerous operating condition. Press **OK** when ready.
7. At the next screen, when the step shows `APPLY GAS 1`, press **OK** to continue.
8. When Flow Gas 1 and Read Gas 1 are complete and the step shows `APPLY GAS 2`, press OK to continue.
9. When Flow Gas 2 and Read Gas 2 are complete and the step shows `STOP GAS`, press **OK** to continue the calibration with purge.
10. When the screen shows `Loop may be returned to automatic control`, press **OK** to return to the ***CALIBRATION*** screen.
11. On the ***CALIBRATION*** screen, select RESULT.
    On the ***RESULT*** screen, the results of the calibration are displayed. In the event the calibration cycle fails, the reason is displayed here as well. The calibration results are described as follows:

Success	Calibration completed successfully
Failed Constant	The calculated calibration constant is outside the range of ±20.00.
Failed Slope	The calculated calibration slope is outside the suggested range of 34.5 to 57.5.
WarmUp Abort	Attempted to perform a calibration during warm-up.
Alarm Abort	Another alarm occurred and caused the calibration cycle to abort.

12. In the event of a calibration failure, do the following:
    a) From the ***RESULT*** menu, press HOME to return to the main menu.
    b) From the main menu, select SERVICE TOOLS.
    c) From the ***OVERVIEW*** menu, select ALERTS.

d) From the ***ALERTS*** menu, select ACTIVE ALERTS.
The ***ACTIVE ALERTS*** menu should contain an `A:CALIBRATION FAILED` alarm.

e) Press the **Left** key to return to the ***ALERTS*** menu.

f) From the ***ALERTS*** menu, select DEVICE STATUS.

g) From the ***DEVICE STATUS*** menu, select ACKNOWLEDGE.

h) From the ***ACKNOWLEDGE*** menu, select ACK CALIBRATION FAILED.

When the process is complete, the system returns to the ***ACKNOWLEDGE*** menu.

3 Product certifications

3.1 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.

3.2 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).

3.3 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.

3.4 Rosemount 6888A In Situ Oxygen Analyzer for general purpose locations

3.4.1 USA/Canada

CSA Certificate	70130119
Standards	CAN/CSA C22.2 No. 61010-1-04, UL 61010-1:2004 (2nd edition), UL 50 (11th edition), CAN/CSA C22.2 No. 60529:05, IEC 60529 (Edition 2.1-2001-02), NEMA 250-2003
Markings	Type 4X, IP66

Conditions of acceptability

1. The unit is intended to be connected to supply mains by qualified personnel in accordance with national (e.g., CEC, NEC, etc,) and local codes.
2. Suitable APPROVED switch and fuse or a circuit breaker shall be provided to facilitate the disconnection of mains power.
3. The maximum operating ambient is considered as follows:
   - 70 °C for Rosemount 6888A Analyzer

- 90 °C for Rosemount 6888A DR Probe

4. Mounting flange temperature shall not exceed 200 °C.

3.4.2 Europe

TUVRheinland QAL1 Certificate	0000038506
Standards	EN15267-1:2009, EN15627-2:2009, EN15627-3:2007, EN14181:2004
MCERTS Certificate	Sira MC140270/03
Standards	EN15267-1:2009, EN15627-2:2009, EN15627-3:2007, EN14181:2014

3.5 Rosemount 6888Xi Digital Analyzer for general purpose locations

3.5.1 USA/Canada

CSA Certificate	70130119
Standards	CAN/CSA C22.2 No. 61010-1-04, UL 61010-1:2004 (2nd edition), CAN/CSA-C22.2 No.94-M91 (R2001), CAN/CSA C22.2 No. 60529:05, UL 50 (11th edition), IEC 60529 (Edition 2.1-2001-02)
Markings	C US, Type 4X, IP66

Conditions of acceptability

1. The unit is intended to be connected to supply mains by qualified personnel in accordance with national (e.g., CEC, NEC, etc.) and local codes.
2. Suitable APPROVED switch and fuse or a circuit breaker shall be provided to facilitate the disconnection of mains power.
3. The maximum operating ambient is considered as follows: 50 °C for Rosemount 6888Xi Advanced Electronics.

3.6 Rosemount SPS4001B and Rosemount IMPS4000 Autocalibration Devices for general purpose locations

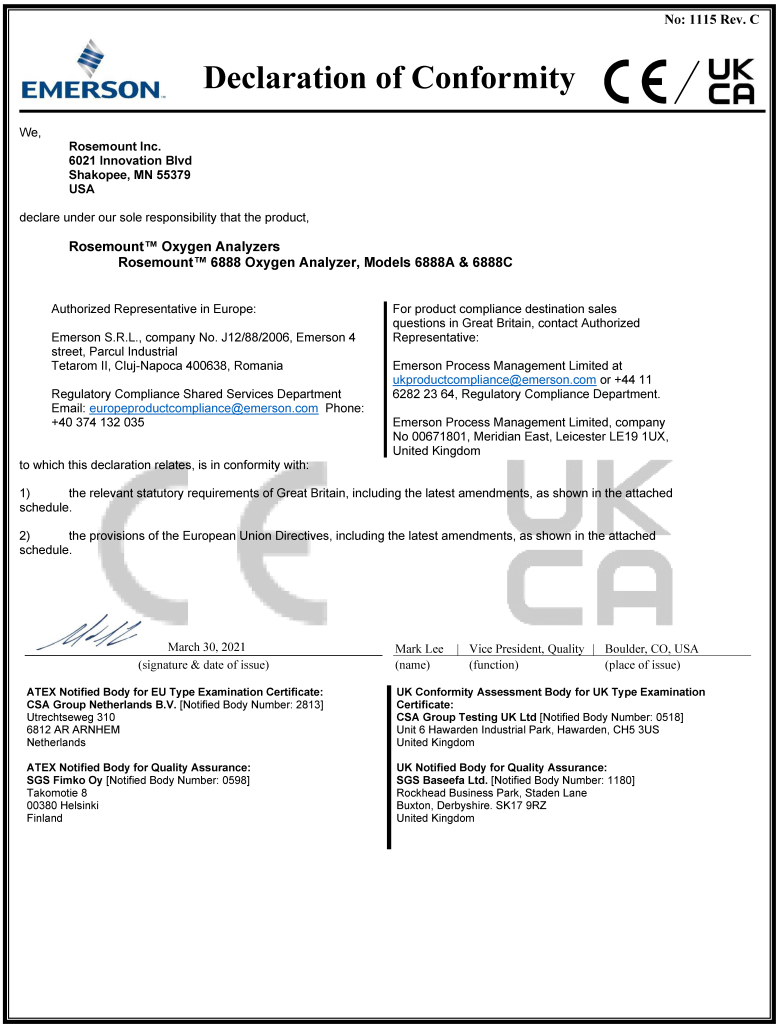
3.6.1 USA/Canada

CSA certificate 80052172

Standards CAN/CSA C22.2 No. 61010-1-04; ANSI/UL 61010-1:2004, (2nd edition); CSA C22.2 No. 94.2 (1st edition); ANSI/UL 50 E (1st edition); CSA C22.2 No. 60529:05 (R2010); ANSI/IEC 60529-2004 (R2011)

Markings C US Type 4X, IP66

A Declaration of Conformity



No: 1115 Rev. C

EMERSON

Declaration of Conformity

CE / UK CA

We,

Rosemount Inc.
6021 Innovation Blvd
Shakopee, MN 55379
USA

declare under our sole responsibility that the product,

Rosemount™ Oxygen Analyzers
Rosemount™ 6888 Oxygen Analyzer, Models 6888A & 6888C

Authorized Representative in Europe:

Emerson S.R.L., company No. J12/88/2006, Emerson 4 street, Parcul Industrial
Tetarom II, Cluj-Napoca 400638, Romania

Regulatory Compliance Shared Services Department
Email: europeproductcompliance@emerson.com Phone: +40 374 132 035

For product compliance destination sales questions in Great Britain, contact Authorized Representative:

Emerson Process Management Limited at ukproductcompliance@emerson.com or +44 11 6282 23 64, Regulatory Compliance Department.

Emerson Process Management Limited, company No 00671801, Meridian East, Leicester LE19 1UX, United Kingdom

to which this declaration relates, is in conformity with:

1) the relevant statutory requirements of Great Britain, including the latest amendments, as shown in the attached schedule.

2) the provisions of the European Union Directives, including the latest amendments, as shown in the attached schedule.

March 30, 2021	Mark Lee	Vice President, Quality	Boulder, CO, USA
(signature & date of issue)	(name)	(function)	(place of issue)

ATEX Notified Body for EU Type Examination Certificate:
CSA Group Netherlands B.V. [Notified Body Number: 2813]
Utrechtseweg 310
6812 AR ARNHEM
Netherlands

ATEX Notified Body for Quality Assurance:
SGS Fimko Oy [Notified Body Number: 0598]
Takomotie 8
00380 Helsinki
Finland

UK Conformity Assessment Body for UK Type Examination Certificate:
CSA Group Testing UK Ltd [Notified Body Number: 0518]
Unit 6 Hawarden Industrial Park, Hawarden, CH5 3US
United Kingdom

UK Notified Body for Quality Assurance:
SGS Baseefa Ltd. [Notified Body Number: 1180]
Rockhead Business Park, Staden Lane
Buxton, Derbyshire. SK17 9RZ
United Kingdom

No: 1115 Rev. C

EMERSON.

Declaration of Conformity

CE / UK CA

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

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

PED Directive (2014/68/EU)
Sound Engineering Practice

ATEX Directive (2014/34/EU)

(Only valid for Model 6888C)

Sira14ATEX1031X – Flameproof
Equipment Group II 2 G
Ex db IIB+H2 T3 Gb; IP66
-40°C ≤ Ta ≤ +70°C Autocal Enclosure and Probe Assembly
-40°C ≤ Ta ≤ +90°C Standard Enclosure and Probe Assembly eq. "DR Probe"

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

Electromagnetic Compatibility Regulations 2016 (S.I. 2016/1091)
Designated Standards:
EN 61326-1:2013

Electrical Equipment (Safety) Regulations 2016 (S.I. 2016/1101)
Designated Standards:
EN 61010-1:2010

Pressure Equipment (Safety) Regulations 2016 (S.I. 2016/1105)
Sound Engineering Practice

Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016 (S.I. 2016/1107)
(Only valid for Model 6888C)
CSAE 21UKEX1215X – Flameproof
Equipment Group II 2 G
Ex db IIB+H2 T3 Gb; IP66
-40°C ≤ Ta ≤ +70°C Autocal Enclosure and Probe Assembly
-40°C ≤ Ta ≤ +90°C Standard Enclosure and Probe Assembly eq. "DR Probe"

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

B China RoHS table

表格 1: 含有 China RoHS 管控物质超过最大浓度限值的部件型号列
Table 1: List of Model 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
壳体组件 Housing Assembly	O	O	O	X	O	O
传感器组件 Sensor Assembly	O	O	O	X	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.

Quick Start Guide
00825-0100-4890, Rev. AC
October 2022

For more information: **Emerson.com**

ROSEMOUNT™

EMERSON™