Quick Start Guide 00825-0100-3056, Rev AB March 2020

Rosemount[™] 56

Dual Channel Transmitter





ROSEMOUNT

Safety Information

Your instrument purchase from Emerson is one of the finest available for your particular application. These instruments have been designed and tested to meet many national and international standards. Experience indicates that its performance is directly related to the quailty of the installation and knowledge of the user in operating and maintaining the instrument. To ensure its continued operation to the design specifications, personnel should read this Quick Start Guide thoroughly before proceeding with installation, commissioning, operation, and maintenance of this instrument. If this equipment is used in a manner not specified by the manufacturer, the protection provided by it against hazards may be impaired.

- Failure to follow the proper instructions may cause any one of the following situations to occur: loss of life, personal injury, property damage, damage to this instrument, and warranty invalidation.
- Ensure that you have received the correct model and options from your purchase order. Verify
 that this Quick Start Guide covers your model and options. If it does not, call 800 854 8257 or 949
 757 8500 to request the correct Quick Start Guide.
- For clarification of instructions, contact your Rosemount representative.
- Follow all warnings, cautions, and instructions marked on and supplied with the product.
- Use only qualified personnel to install, operate, program, and maintain the product.
- Install equipment as specified in the Installation section of this Quick Start Guide. Follow
 appropriate local and national codes. Only connect the product to electrical and pressure sources
 specified in this Quick Start Guide.
- Use only factory documented components for repair. Tampering or unauthorized substitution of
 parts can affect product performance and cause unsafe operation of your process.
- All equipment doors must be closed, and protective covers must be in place unless qualified
 personnel are performing maintenance.

A WARNING

Risk of electrical shock

Installation and servicing of this product may expose personnel to dangerous voltages.

Equipment protected throughout by double insulation.

Disconnect main power wired to separate power source before servicing.

Do not operate or energize instrument with case open.

Signal wiring within this box must be rated at least 240 V for European mains operation.

Non-metallic cable strain reliefs do not provide grounding between conduit connections. Use grounding type bushings and jumper wires.

Unused cable conduit entries must be securely sealed by non-flammable closures to provide exposure integrity in compliance with personal safety and environmental protection requirements. Unused conduit openings must be sealed with Type 4X or IP66 conduit plugs to

maintain the ingress protection rating (Type 4X). Electrical installation must be in accordance with the National Electrical Code (ANSI/NFPA-70)

electrical installation must be in accordance with the National Electrical Code (ANSI/NFPA-70) and/or any other national or local codes.

Operate only with front panel fastened and in place.

Safety and performance require that this instrument be connected and properly grounded through a three-wire power source.

Proper use and configuration is the operator's responsibility.

A CAUTION

Radio interference

This product generates, uses, and can radiate radio frequency energy and thus can cause radio communication interference. Improper installation or operation may increase such interference. As temporarily permitted by regulation, this unit has not been tested for compliance within the limits of Class A computing devices, pursuant to Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference.

Operation of this equipment in a residential area may cause interference, in which case the operator, at his own expense, will be required to take whatever measures may be required to correct the interference.

ACAUTION

This product is not intended for use in the light industrial, residential, or commercial environments per the instrument's certification in ENG1226-1: 2006.

AWARNING

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.

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1 First steps

1.1 Unpack and inspect

Procedure

- 1. Inspect the shipping container. If it is damaged, contact the shipper immediately for instructions.
- 2. If there is no apparent damage, unpack the container. Be sure all items shown on the packing list are present. If items are missing, notify Emerson immediately.

1.2 Mount

Figure 1-1: Panel Mount Front View

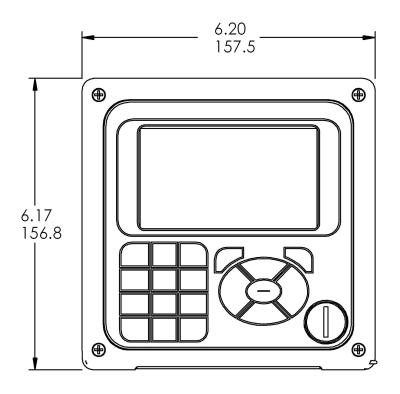
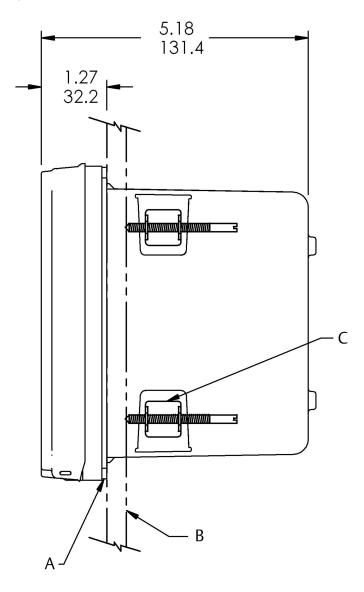
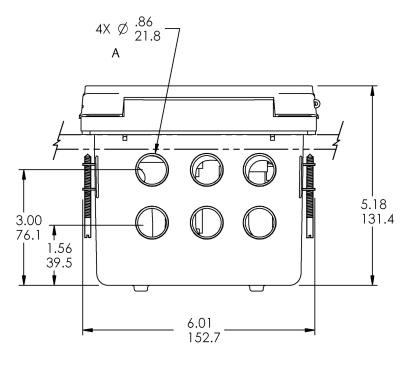


Figure 1-2: Panel Mount Side View



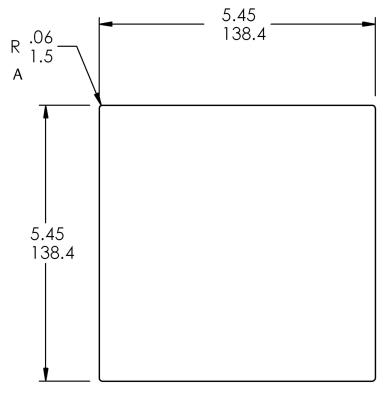
- A. Panel mount gasket
- B. Panel supplied by others. Maximum thickness: .375 in. (9.52 mm)
- C. 4X mounting bracket and screws provided with instrument





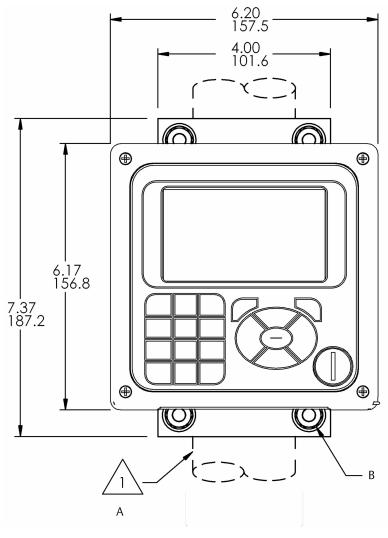
A. Conduit openings

Figure 1-4: Panel Mount Panel Cut-Out



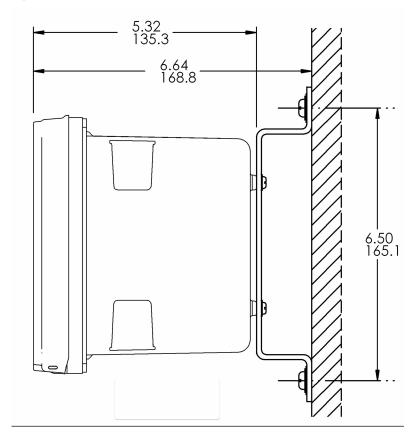
A. Maximum



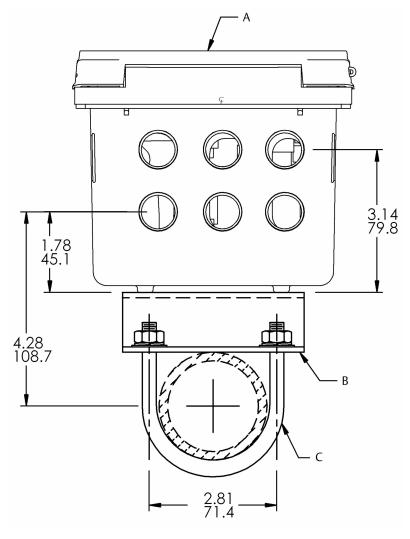


- A. 2-in. (50.8 mm) pipe supplied by customer
- B. Four cover screws

Figure 1-6: Wall Mount Side View



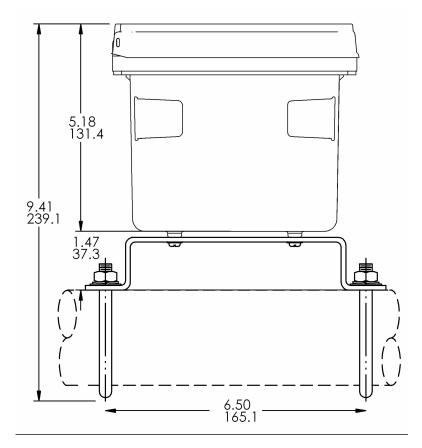




A. Front panel

- B. 2-in. (50.8 mm) pipe mount bracket
- C. Two sets U-bolts for 2-in. (50.8 mm) pipe in kit PN 23820-00





2 Install

2.1 General installation information

- 1. Install the transmitter with a sunshield or out of direct sunlight and areas with extreme temperatures. The transmitter cannot be operated in ambient (shaded) conditions greater than 140 °F (60 °C).
- Install the transmitter in an area where vibration and electromagnetic and radio frequency interference are minimized or absent.
- 3. Keep the transmitter and sensor wiring at least one foot from high voltage conductors. Be sure there is easy access to the transmitter.
- 4. The transmitter is suitable for panel, pipe, or surface mounting. Refer to Mount.
- 5. Install cable gland fittings and plugs as needed to properly seal the transmitter on all six enclosure openings. The USB port cover must be fully installed on the front cover to ensure proper transmitter sealing.

A WARNING

Risk or electrical shock

Electrical installation must be in accordance with the National Electric Code (ANSI/NFPA-70) and/or any other applicable national or local codes.



This symbol identifies a risk of electrical shock.



This symbol identifies a potential hazard. When this symbol appears, consult the manual for appropriate action.

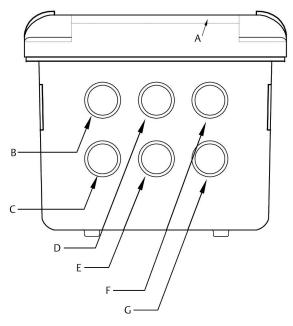
2.2 Prepare conduit openings

There are six conduit openings in all configurations of the transmitter.

Note

Emerson fits four of the openings with plugs upon shipment.

Figure 2-1: Conduit Openings



- A. Front panel/keypad
- B. Power leads
- C. Alarm relay leads
- D. Sensor 1 cable
- E. 4-20 mA/HART[®]/Profibus[®] leads
- F. Sensor 2 cable
- G. Spare opening

Note

Always use proper cable gland fittings and plugs for wire and cable installations.

Conduit openings accept ½-in. (12.7 mm) conduit fittings or PG13.5 cable glands. To keep the case watertight, block unused openings with Type 4X or IP66 conduit plugs.

To maintain ingress protection for outdoor use, seal unused conduit holes with suitable conduit plugs.

Note

Use watertight fittings and hubs that comply with your requirements. Connect the conduit hub to the conduit before attaching the fitting to the transmitter.

3 Wire

3.1 General wiring information

The transmitter is easy to wire.

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

3.1.1 Removable connectors and signal input boards

The transmitter uses removable signal input boards and communication boards for ease of wiring and installation.

You can remove each of the signal boards either partially or completely from the enclosure for wiring. The transmitter has three slots for placement of up to two signal input boards and one communication board.

Slot 1 - left	Slot 2 - center	Slot 3 - right
Profibus [®] board	Signal board 1	Signal board 2

3.1.2 Signal input boards

Slots 2 and 3 are for signal input measurement boards.

Procedure

- 1. Wire the sensor leads to the measurement board following the lead locations marked on the board.
- 2. Carefully slide the wired board fully into the enclosure slot and take up the excess sensor cable through the cable gland.
- 3. Tighten the cable gland nut to secure the cable and ensure a sealed enclosure.

Note

For the purpose of replacing factory-installed signal input boards, Rosemount is the sole supplier.

3.1.3 Digital communication boards

HART[®] digital communication is standard on the transmitter. HART versions 5 and 7 are available on the transmitter and can be switched using the local keypad. A Profibus[®] DP communication board is available as an option for transmitter communication with a host.

HART communications support Bell 202 digital communications over an analog 4-20 mA current output. Profibus DP is an open communications protocol which operates over a dedicated digital line to the host.

3.1.4 Alarm relays

Emerson supplies four alarm relays with the switching power supply (85 to 264 Vac, 03 order code) and the 24 Vdc power supply (20 - 30 Vdc, 02 order code). You can use all relays for process measurement(s) or temperature. You can also configure any relay as a fault alarm instead of a process alarm. In addition, you may configure any relay independently and program it to activate pumps or control valves.

As process alarms, alarm logic (high or low activation or USP*) and deadband are user-programmable. Customer-defined failsafe operation is supported as a programmable menu function to allow all relays to be energized or not energized as a default condition upon powering the transmitter. You may program the USP* alarm to activate when the conductivity is within a user-selectable percentage of the limit. USP* alarming is available only when a contacting conductivity measurement board is installed.

3.2 HART[®] current output wiring

Emerson ships all instruments with four 4-20 mA analog outputs.

Wire the relay leads on each of the independent relays to the correct position on the main board using the lead markings (+/positive, -/negative) on the board. Emerson provides male mating connectors with each unit.

3.3 Wire sensor to transmitter

Procedure

- 1. Wire the correct sensor leads to the main board using the lead locations marked directly on the board.
- 2. Carefully slide the wired board fulling into the enclosure slot and take up the excess sensor cable through the cable gland.

A CAUTION

Keep sensor and output signal wiring separate from loop power wiring. Do not run sensor and power wiring in the same conduit or close together in a cable tray.

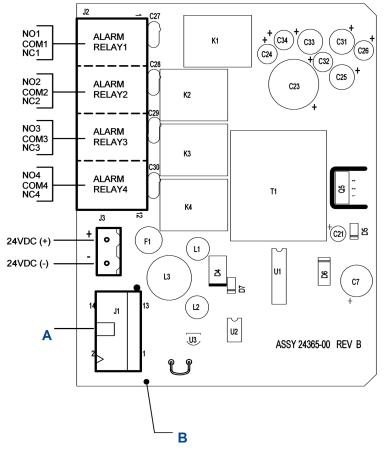


Figure 3-1: Power Wiring for 24 Vdc Power Supply (02 Order Code) PN 24365-00

- A. To main board (ribbon cable)
- B. Rosemount 56 DC power supply board PN 24365-00

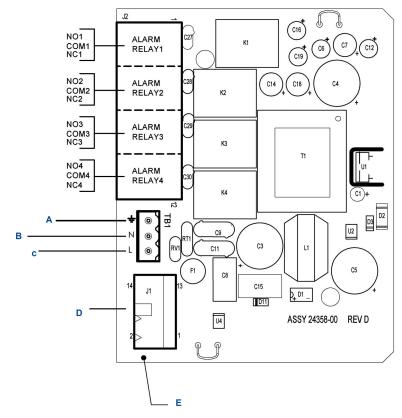


Figure 3-2: Power Wiring for 85-264 Vac Power Supply (03 Order Code) PN 24538-00

- A. Earth ground
- B. Neutral
- C. Line power
- D. To main board (ribbon cable)
- E. Rosemount 56 AC power supply board PN 24358-00

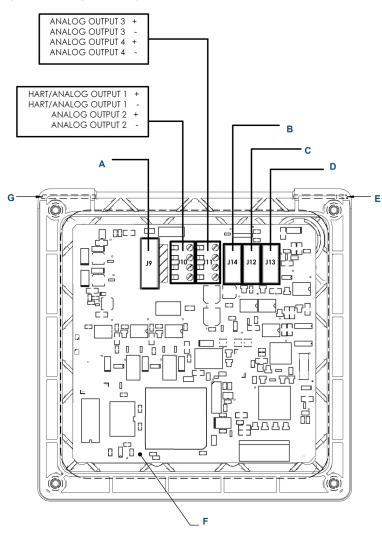


Figure 3-3: Output Wiring for Main PCB PN 24308-00

- A. To power supply PCB (ribbon cable)
- B. To digital I/O comm. board
- C. To sensor 1 signal board
- D. To sensor 2 signal board
- E. Hinge pin
- F. Transmitter main board, CPU PCB PN 24308-00
- G. Hinge pin

For recommended wire entry points, see Figure 2-1.

Figure 3-4: Contacting Conductivity Signal Board and Sensor Cable Leads





4 Navigating the display

4.1 User interface

The transmitter has a large display which shows two live measurement readouts in large digits and up to six additional process variables or diagnostic parameters concurrently. The display is back-lit, and you can customize the format to meet your requirements. You can use an alphanumeric keypad, similar to a cell phone keypad, to enter data during programming and calibration or lengthy tags to describe process points, sensors, or instrumentation.



4.2 Instrument keypad

There are three function keys, four navigation keys, and an alpha-numeric keypad on the instrument keypad.

Function keys

Use the ENTER/MENU key to access menus for programming and calibrating the instrument as well as retrieving sorted data. Eight top-level menu items appear when you press ENTER/MENU.

- *Calibrate*: Calibrate the attached sensor(s) and analog output(s).
- **Program**: Program outputs, measurement, temperature, and security codes.
- Hold: Suspend current outputs.
- **Display Setup**: Program graphic trend display, brightness, main display format, tags, language, and warnings.
- **Data storage and retrieval**: Enable data and event storage, download data, and view events.
- HART[®] or Profibus[®]: Program HART and Profibus communication parameters.
- Time and Date: Set and view real-time clock settings.
- *Reset*: Reset all instrument settings, calibration settings, or current outputs to factory defaults.

You can also use the ENTER/MENU key to enter selections or enable programming and calibration steps.

Use the EXIT key to return to the previous menu level.

Use the **INFO** key to display detailed instructions and explanations during programming and calibration procedures. You can also use it to see troubleshooting tips for all faults and warnings that may occur during calibration or continuous operation in process.

Navigation keys

The four navigation keys arranged around the ENTER/MENU key operate in an intuitive manner similar to the navigation keys on a computer keyboard. During menu operation, use these keys to move the highlighted screen selection to another adjacent screen item. During tag entry, use the Left key is used to delete entries during active alpha-numeric character entry.

Alpha-numeric keypad

The alpha-numeric keypad has 12 keys as outlined below.

• Nine keys are alpha-numeric.

- One key is a dedicated **1** key.
- One key is a dedicated **0** key.
- One key is a dedicated "." (decimal point) key.

The alpha-numeric keypad operates the same as entries on a mobile phone. The nine alpha-numeric keys have multiple characters that you can use for tag entries or during programming and calibration steps. Make character selections by pressing the key multiple times to toggle the characters that are available on each key.

4.3 Main display

The transmitter displays one or two primary measurement values, up to six secondary measurement values, a Fault and Warning banner, alarm relay flags, and a digital communications icon.

Process measurements

Two process variables are displayed if two signal boards are installed. One process variable and process temperature are displayed if one signal board is installed with one sensor. The upper display area shows the Sensor 1 process reading. The center display area shows the Sensor 2 process reading. For dual conductivity, you can assign the upper and center display areas to different process variables as follows:

Process variables for upper display - example	Process variables for center display - example
Measure 1	Measure 1
% Reject	Measure 2
% Pass	% Reject
Ratio	% Pass
	Ratio
	Blank

For single input configurations, the upper display area shows the live process variable, and you can assign the center display area to Temperature or Blank.

Secondary values

Up to six secondary values are shown in display quadrants at the bottom half of the screen. You can program all six secondary value positions to any displayable parameter available.

4.4 Menu system

The menu system is similar to a computer. Press the ENTER/MENU key at any time to open the top-level menu including Calibration, Hold, Programming, Display, Data, and HART[®] functions. To find a menu item, use the directional navigation keys to highlight a menu item. Press ENTER/ MENU, direct the cursor to the desired operation, and follow the screen prompts. Press the BACK screen control available on some menu screens to revert to the immediate previous menu screen. Press the EXIT key to return to the previous hierarchical menu level.

Fault and Warning banners

If the transmitter detects a problem with itself or the sensor, the *Fault* banner (red) and/or *Warning* banner (yellow) appears at the bottom of the main display. A fault requires immediate attention. A warning indicates a problematic condition or an impending failure. For detailed troubleshooting assistance, press INFO.

5 Start up transmitter

Procedure

1. Wire sensor(s) to the signal boards.

See Wire for wiring instructions. Refer to the sensor Quick Start Guide for additional details. Make current output, alarm relay, and power connections.

2. Once connections are secured and verified, apply power to the transmitter.

A WARNING

Electrical shock

Electrical installation must be in accordance with the National Electrical Code (ANSI/NFPA-70) and/or any other applicable national or local codes.



This symbol identifies a risk of electical shock.



This symbol identifies a potential hazard. When this symbol appears, consult the manual for appropriate action.

When the transmitter is powered up for the first time, *Quick Start* screens appear. Quick Start operating tips are as follows:

- a. Window screens appear. The field with the focus appears with dark blue back-lighting. To edit the field with focus, press **ENTER/MENU**.
- b. The *Time and Date* screen to set the real-time clock appears. To accept the displayed time, press ENTER on Time and date OK. To change the date and time, press Down to navigate to Change the time and date.
- To choose the language, press ENTER/MENU to edit the active field and scroll to the language of choice. Press ENTER/MENU and then press Down to highlight NEXT. The navigation rules for operating the keypad are displayed.
- 4. Choose the measurement for Sensor 1 and Sensor 2. Keypad operation guidlines appear to guide you on how to operate the user interface.

Note

To edit a field with backlit focus, press ENTER/MENU. To scroll up or down, use the keys above or below the ENTER key. To move the cursor left or right, use the keys to the left or right of the ENTER key. To edit a numeric value including decimal points, use the alphanumeric keypad and then press ENTER.

Note

Press ENTER to store a setting or value. Press EXIT to leave without storing changes. Press EXIT during Quick Start to return the display to the initial startup screen (*Select language*). To proceed to the next Quick Start step, use the **Right** or **Down** key to hightlight NEXT. Press ENTER.

After the last step, the main display appears. The current outputs are assigned to default values before probes are wired to the transmitter.

- 5. To change output and all settings, press ENTER/MENU from the live screen. Using the **Down** and **Right** keys, select a menu and navigate to the screen of choice.
- 6. To return the transmitter to the factory default settings, choose **Reset** under the Menu selection screen.

Please call Rosemount Customer Support Center at 1-800-854-8527 if you need further support.

6 Product certifications

Rev 1.0

6.1 European Directive information

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

6.2 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).

6.3 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.

6.4 USA

6.4.1 FM hazardous locations

Certificate	FM17US0028X
Standards	FM Class 3600:2011
	FM Class 3611:2004
	FM Class 3810:2005
	ANSI/IEC 60529:2004
Markings	Non-incendive Class I, Division 2, Groups ABCD
	T4 Tamb -10 °C to +60 °C; dust tight
	Class II, Division 2, Groups EFG; Class III
	Per Drawing 1400667
	IP66 enclosure

Special Conditions for Safe Use (X):

1. Sensors having exposed electrodes in the process will be used in a non-flammable liquid only.

6.4.2 CSA hazardous locations

Certificate	70173522
Standards	CSA Standard C22.2 No. 010, CSA Standard C22.2 No. 0.4-04, CSA Standard C22.2 No. 25-1966, CSA Standard C22.2 No. 94-M1991, CSA Standard C22.2 No. 142- M1987, CSA Standard C22.2 No. 213-M1987, CSA Standard C22.2 No. 60529:05 (reaffirmed 2015), ANSI/IEC 60529-2004 (reaffirmed 2011), ANSI/ISA 12.12.01: 2007, UL Standard No. 50, 11th edition, UL Standard No. 508, 17th edition
Markings	Class I, Division 2, Groups A,B, C, and D; Class II, Division 2, Groups E, F, and G; Class III Maximum ambient 60 °C T4 Type 4X enclosure, IP66

6.4.3 UL ordinary locations

Standards Markings	c Us
Certificate	20160921-E207618
Standards	UL 61010-1, CAN/CSA C22.2 No. 61010-1

6.5 Canada

6.5.1 CSA hazardous locations

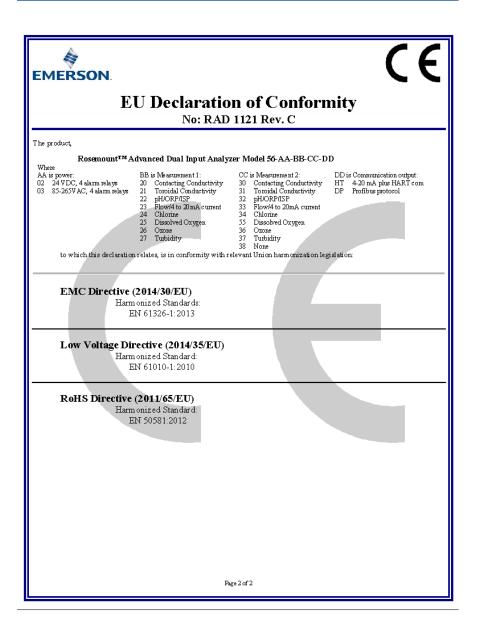
Certificate Standards	70173522 CSA Standard C22.2 No. 010, CSA Standard C22.2 No. 0.4-04, CSA Standard C22.2 No. 25-1966, CSA Standard C22.2 No. 94-M1991, CSA Standard C22.2 No. 142- M1987, CSA Standard C22.2 No. 213-M1987, CSA Standard C22.2 No. 60529:05 (reaffirmed 2015), ANSI/IEC 60529-2004 (reaffirmed 2011), ANSI/ISA 12.12.01: 2007, UL Standard No. 50, 11th edition, UL Standard No. 508. 17th edition
Markings	Class I, Division 2, Groups A,B, C, and D; Class II, Division 2, Groups E, F, and G; Class III Maximum ambient 60 °C T4 Type 4X enclosure, IP66

A Declaration of Conformity

Note

Please see website for most recent Declaration.

[[EMERSON **EU Declaration of Conformity** No: RAD 1121 Rev. C We. Rosemount Inc. 8200 Market Boulevard Chanhassen, MIN 55317-9685 USA declare under our sole responsibility that the product, Rosemount[™] Advanced Dual Input Analyzer Model 56-AA-BB-CC-DD manufactured by, Rosemount Inc. 8200 Market Boulevard Chanhassen, MIN 55317-9685 USA to which this declaration relates, is in conformity with the provisions of the European Union Directives, including the latest amendments, as shown in the attached schedule. Assumption of conformity is based on the application of the harmonized standards and, when applicable or required, a European Union notified body certification, as shown in the attached schedule. det 1 Ri Vice President of Global Quality (function) (signature) 10-Jan-19; Shakopee, MN USA Chris LaPoint (name) (date of issue & place) Page 1 of 2



B China RoHS table

含有China RoHS 管控物质超过最大浓度限值的部件型号列表 56 List of 56 Parts with China RoHS Concentration above MCVs

	有害物质 / Hazardous Substances					
部件名称 Part Name	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	ο	0	о	0	ο
传感器组件 Sensor Assembly	x	0	0	0	0	0

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.

部件名称 Part Name	组装备件说明 Spare Parts Descriptions for Assemblies
电子组件 Electronics Assembly	电子线路板组件 Electronic Board Assemblies 液晶显示屏或本地操作界面显示屏 LCD or LOI Display
传感器组件 Sensor Assembly	传感器模块 Sensor Module

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