

Rosemount™ 56

Dual Channel Transmitter



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 quality 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.

⚠ WARNING

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.

Read all instructions prior to installing, operating, and servicing the product.

⚠ 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**Electrical shock**

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

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

The equipment is protected throughout by double insulation.

Disconnect main power, wired to separate power source, before servicing.

Ensure that all equipment doors are closed and protective covers are in place, except when maintenance is being performed by qualified personnel.

Signal wiring must be rated at least 240 V.

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

Make sure that the instrument is connected and properly grounded through a three-wire power source.

Proper use and configuration is the operator's responsibility.

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

Operate only with front panel fastened and in place.

Disconnect and lock out power before connecting the power supply.

⚠ 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.

NOTICE

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 the Emerson Customer Care Center at +1 800 999 9307 to request the correct Quick Start Guide.

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

This product generates, uses, and can radiate radio frequency energy, and this can cause radio communication interference.

As temporarily permitted by regulation, this device has been tested for compliance within the limits of Class A computing devices, pursuant to subpart J of part 15 of Federal Communication Commission (FCC) rules, which are designed to take whatever measures may be required to correct the interference.

NOTICE

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

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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 Mounting

Note

Dimensions in the following drawings show inches above and millimeters below.

Figure 1-1: Panel mount, front view

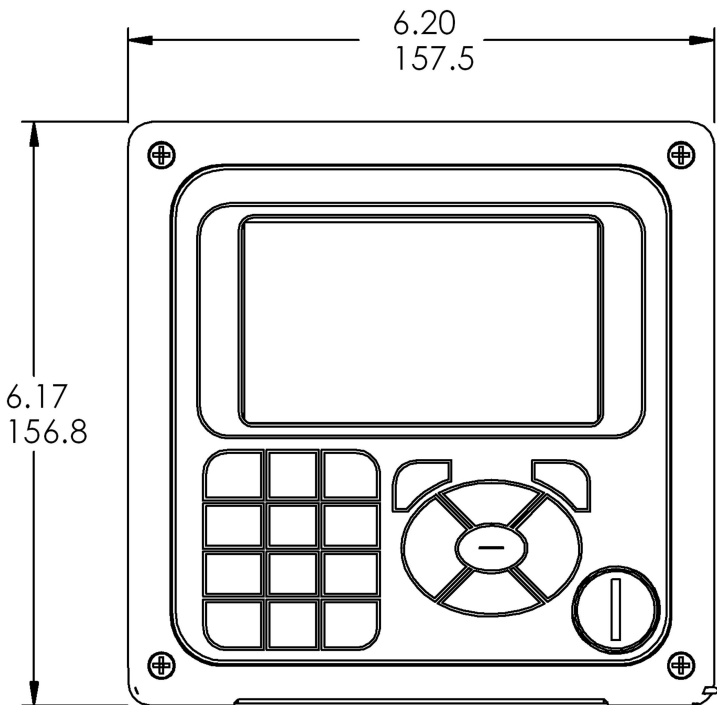
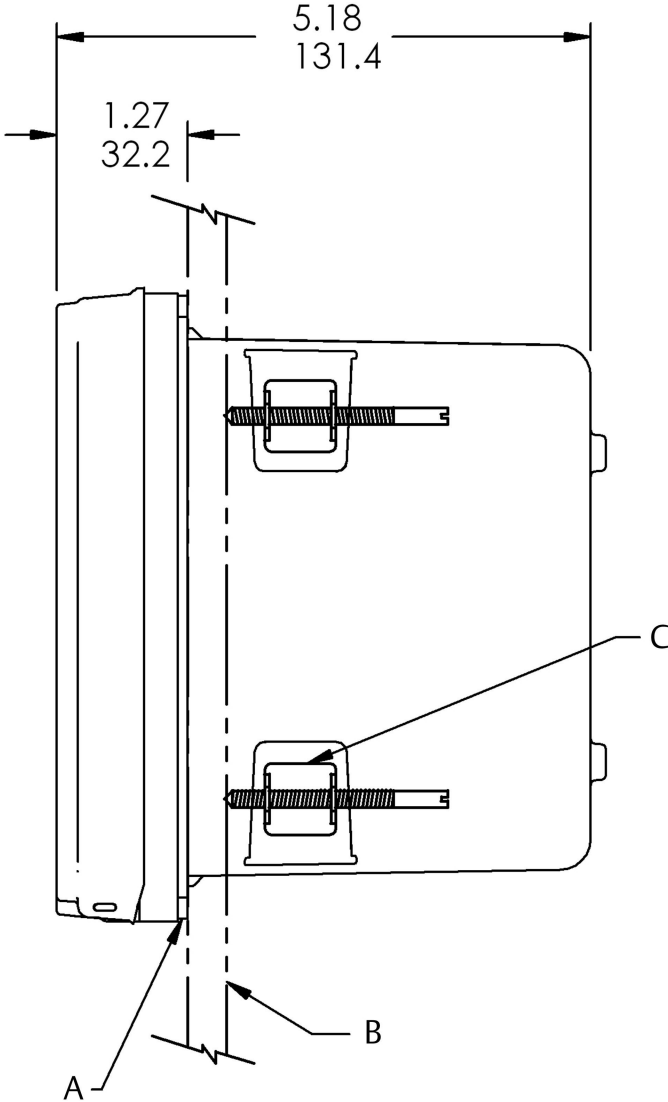
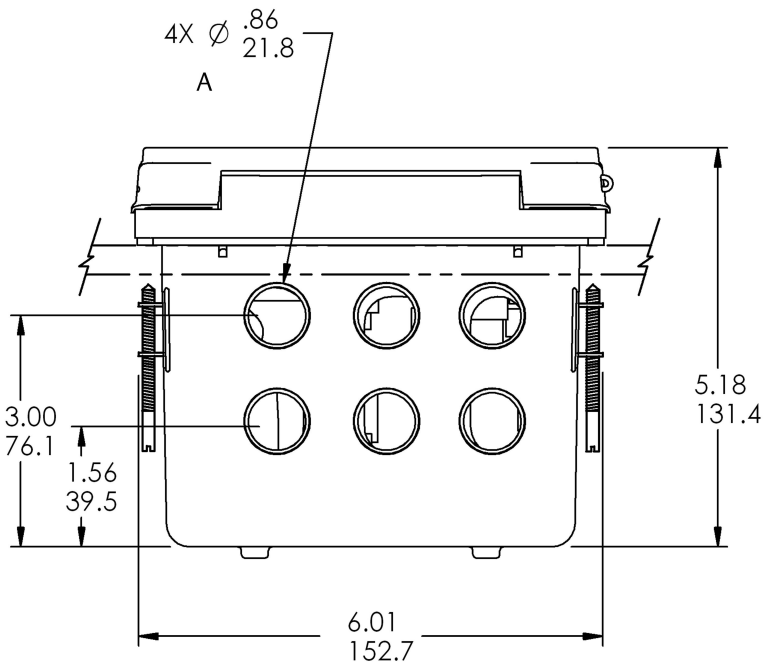


Figure 1-2: Panel mount, side view



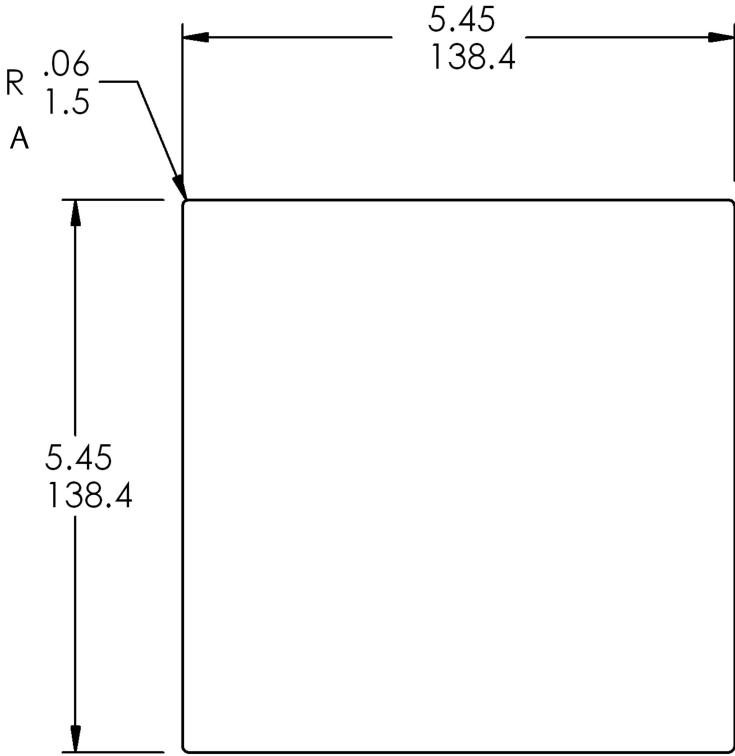
- A. Panel mount gasket
- B. Panel supplied by customer. Maximum thickness: 0.375 in (9.52 mm)
- C. Four mounting brackets and screws provided with instrument

Figure 1-3: Panel mount, bottom view



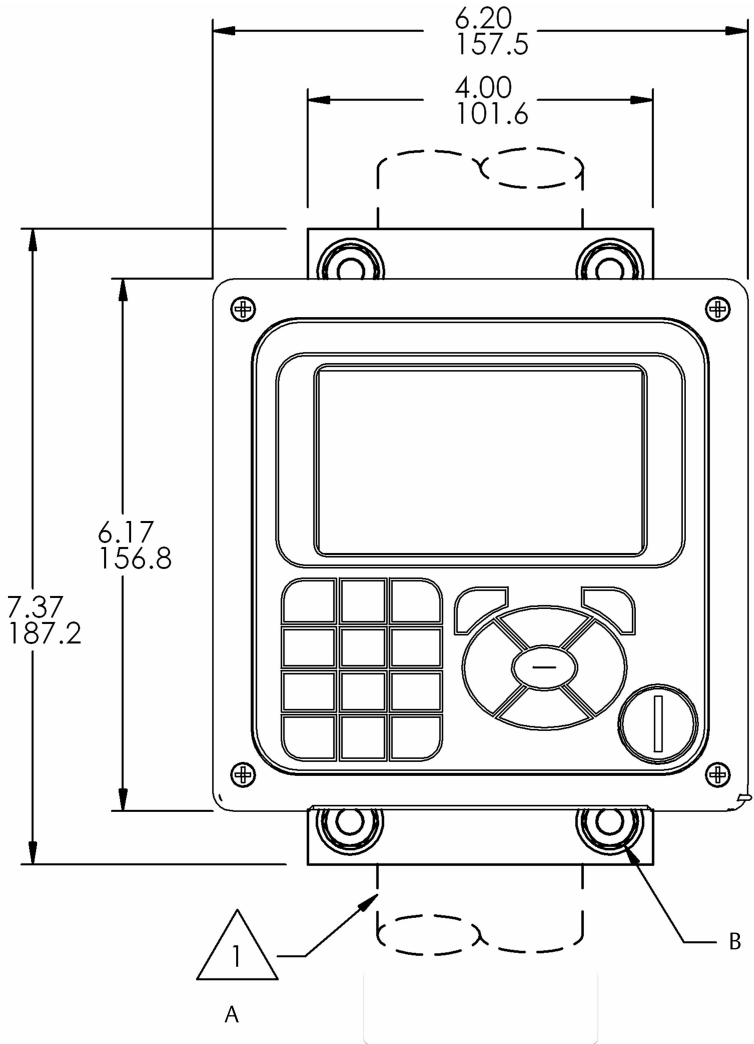
A. Conduit openings

Figure 1-4: Panel cut-out



A. Maximum

Figure 1-5: Wall mount, front view



- A. 2 in (51 mm) pipe supplied by customer
- B. Four cover screws

Figure 1-6: Wall mount, side view

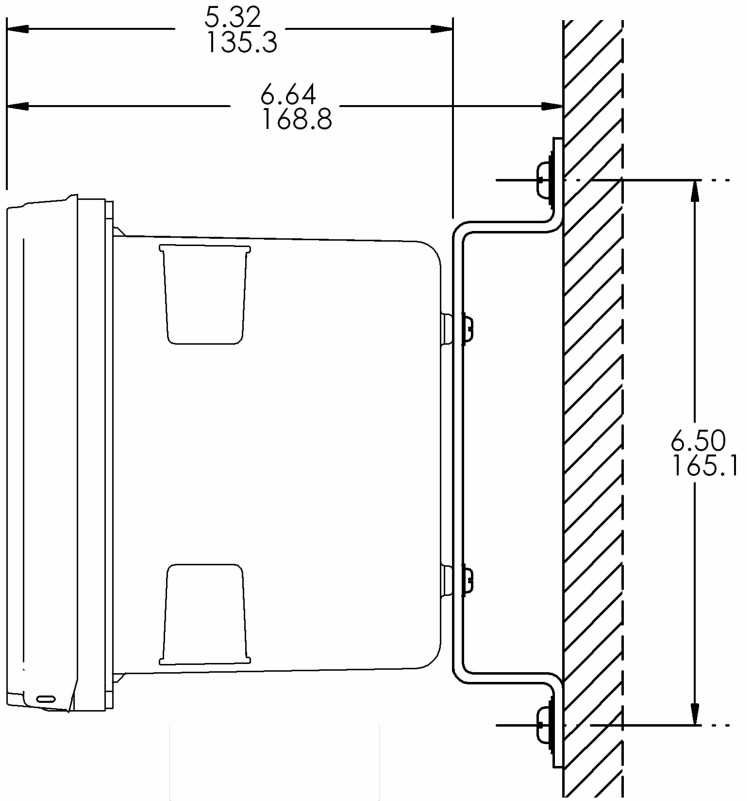
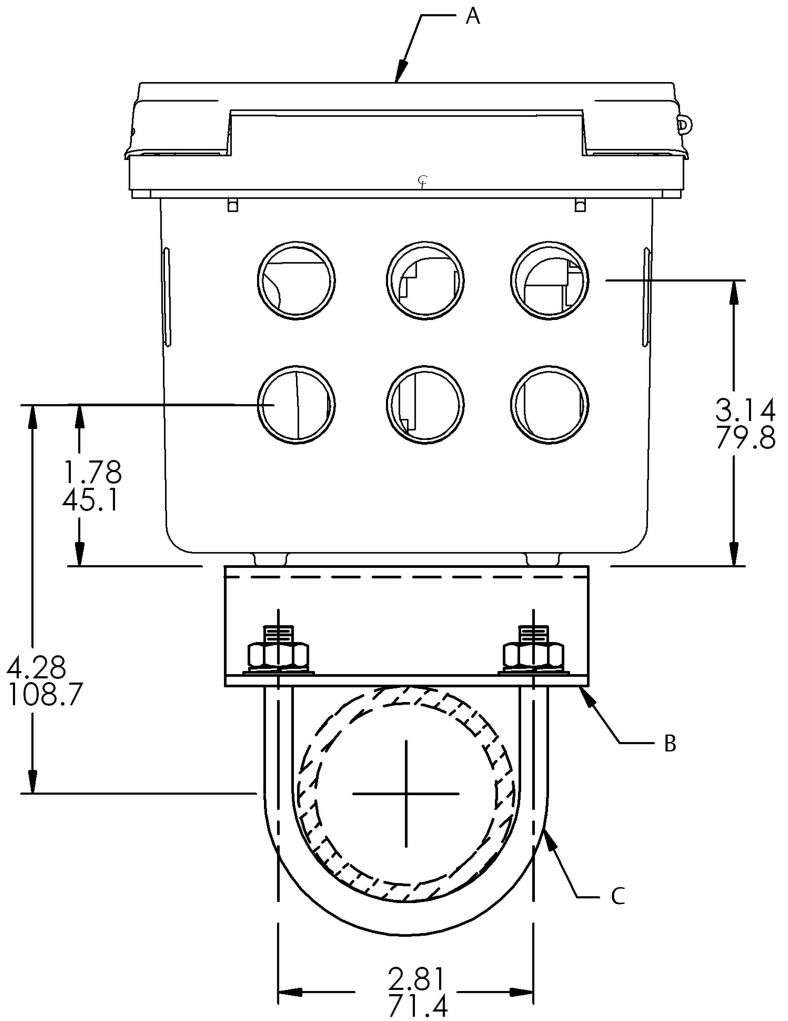
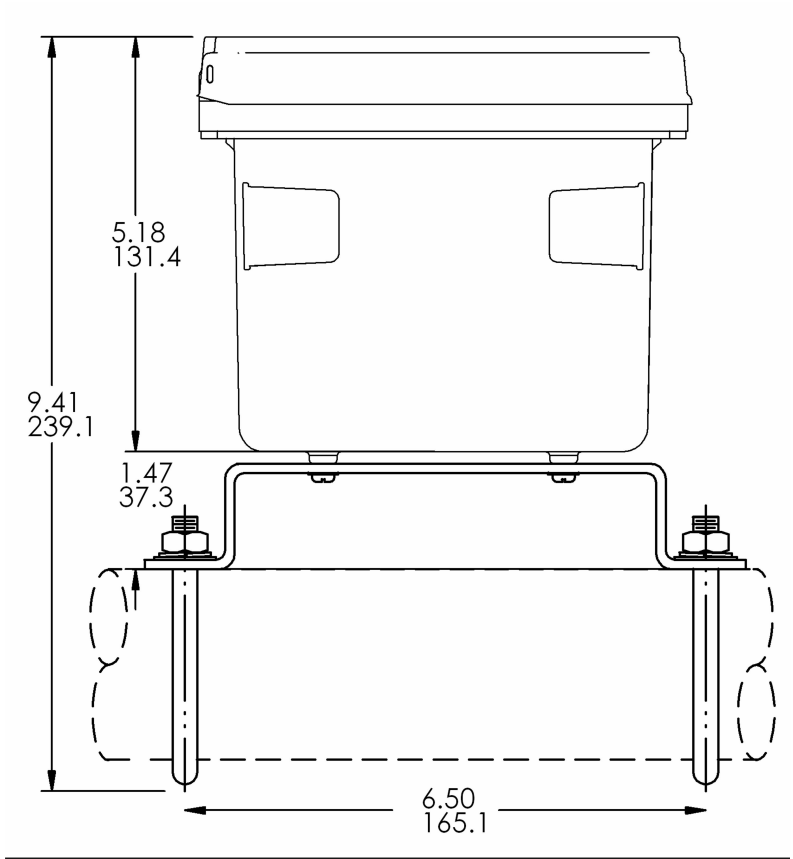


Figure 1-7: Pipe mount, bottom view



- A. Front panel
- B. 2 in (51 mm) pipe mount bracket
- C. Two sets U-bolts for 2 in (51 mm) pipe in kit, PN 23820-00

Figure 1-8: Pipe mount, side view



2 Installation

2.1 General installation information

1. Install the transmitter with a sun shield 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).
2. 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 1 ft (0.30 m) 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 [Mounting](#).
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.

⚠ WARNING**Electrical shock**

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

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

The equipment is protected throughout by double insulation. Disconnect main power, wired to separate power source, before servicing.

Ensure that all equipment doors are closed and protective covers are in place, except when maintenance is being performed by qualified personnel.

Signal wiring must be rated at least 240 V.

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

Make sure that the instrument is connected and properly grounded through a three-wire power source.

Proper use and configuration is the operator's responsibility.

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

Operate only with front panel fastened and in place.

Disconnect and lock out power before connecting the power supply.



This symbol identifies a risk of electrical shock.



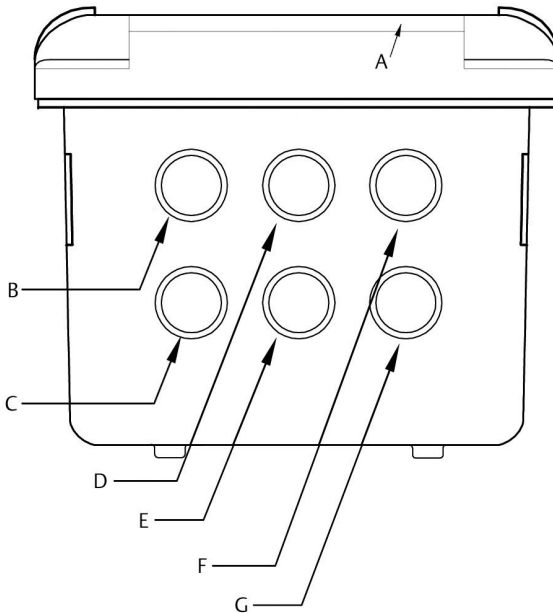
This symbol identifies a potential hazard. When this symbol appears, consult the manual for appropriate action.

2.2 Preparing 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

NOTICE

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

Conduit openings accept 0.5 in (13 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.

NOTICE

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 Wiring

3.1 General wiring information

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 to facilitate 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 Wire the 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.

All 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

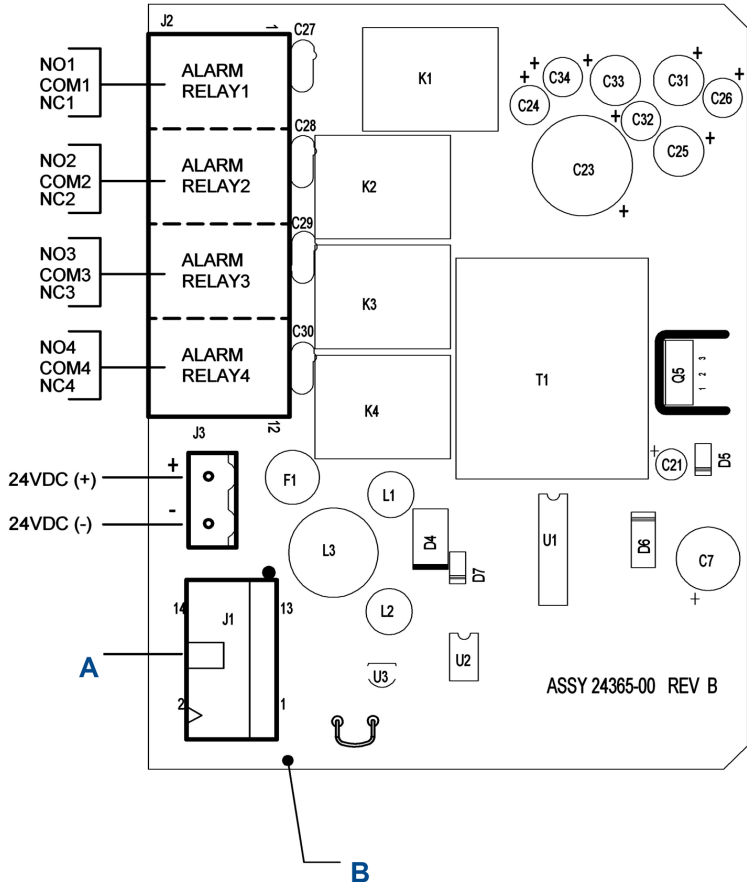
Procedure

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 fully into the enclosure slot and take up the excess sensor cable through the cable gland.

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.

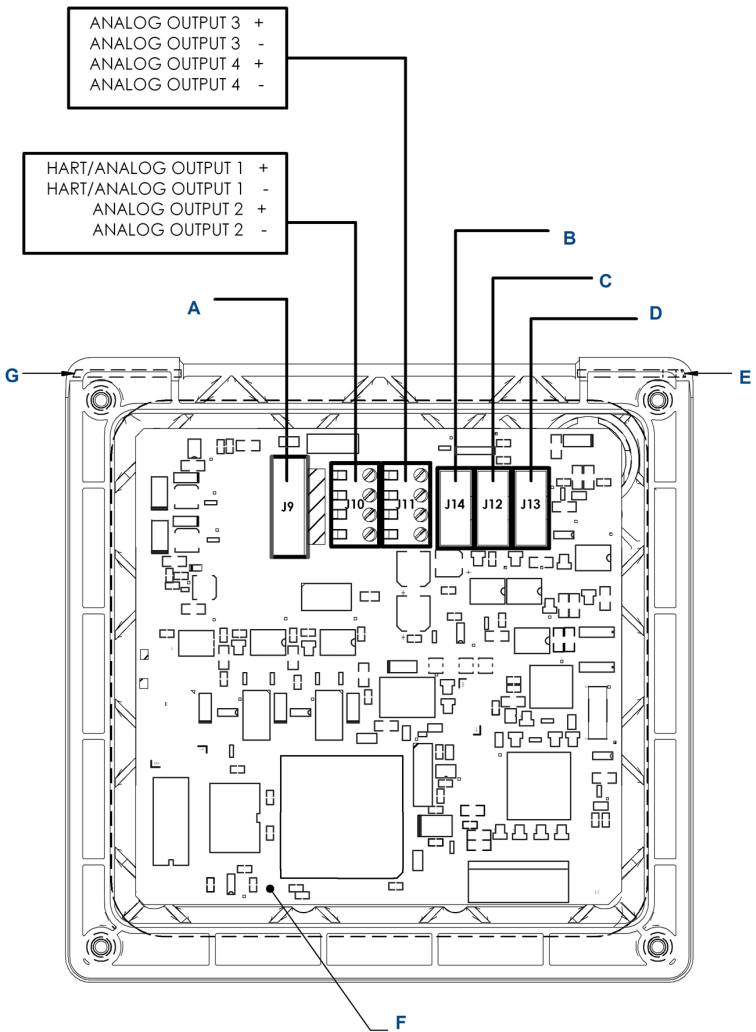
Figure 3-1: Power Wiring for 24 Vdc Power Supply (02 Order Code) PN 24365-00



A. To main board (ribbon cable)

B. Rosemount 56 DC power supply board PN 24365-00

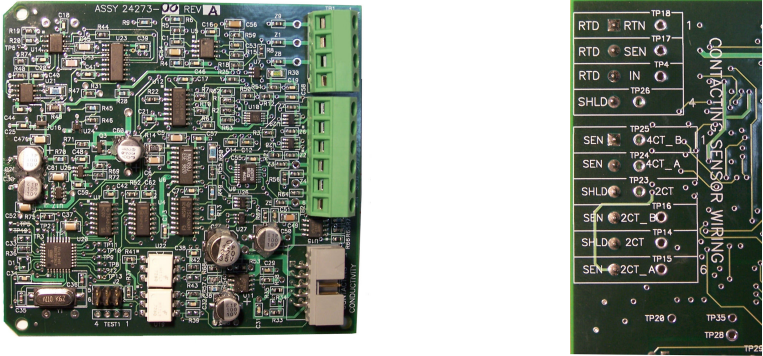
Figure 3-3: Output Wiring for Main PCB PN 24308-00



- 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 alpha-numeric 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, measurements, 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 [Wiring](#) 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.

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 electrical 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**.
3. 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 guidelines 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 highlight **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 the Emerson Customer Support Center at 1-800-999-9307 if you need further support.

6 Approvals

Pollution degree	2
Installation category	II
Altitude	6,561.7 ft (2,000 m)
Humidity	80 percent to temperatures up to 88 °F (31 °C) decreasing linearly to 50 percent relative humidity at 104 °F (40 °C). Maximum 80 percent relative humidity, non-condensing.

7 Product certifications

Rev 1.3

7.1 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](https://www.emerson.com/Rosemount).

7.2 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).

7.3 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.

7.4 USA

7.4.1 USA 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.

7.4.2 USA hazardous locations

Certificate	70173522
Standards	CSA Standard C22.2 No. 25-1966, CSA Standard C22.2 No.94.4:20, CSA Standard C22.2 No. 213-M1987, CAN/CSA-C22.2 No. 61010-1-12 AMD 1 CSA Standard C22.2 No. 60529:05 (Reaffirmed 2015), ANSI/IEC 60529-2004 (Reaffirmed 2011), ANSI/ISA 12.12.01:2007, UL Standard 50E, 3rd edition, UL 61010-1, 3rd 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

7.4.3 USA ordinary locations





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

7.5 Canada

7.5.1 Canada hazardous locations

Certificate	70173522
Standards	CSA Standard C22.2 No. 25-1966, CSA Standard C22.2 No. 94.4:20, CSA Standard C22.2 No. 213-M1987, CAN/CSA-C22.2 No. 61010-1-12 AMD 1, CSA Standard C22.2 No. 60529:-5 (reaffirmed 2015), ANSI/IEC 60529-2004 (reaffirmed 2011), ANSI/ISA 12.12.01: 2007, UL Standard 50E, 3rd edition, UL 61010, 3rd 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

No: RAD1121 Rev. D		
	<h2 style="margin: 0;">Declaration of Conformity</h2>	 / 
<p>We, Rosemount Inc. 6021 Innovation Blvd Shakopee, MN 55379 USA</p>		
<p>declare under our sole responsibility that the product,</p> <p style="text-align: center;">Rosemount™ Advanced Dual Input Analyzer, Model 56</p>		
<p>Authorized Representative in Europe:</p> <p>Emerson S.R.L., company No. J12/88/2006, Emerson 4 street, Parcul Industrial Tetarom II, Cluj-Napoca 400638, Romania</p> <p>Regulatory Compliance Shared Services Department Email: europesproductcompliance@emerson.com Phone: +40 374 132 035</p>	<p>For product compliance destination sales questions in Great Britain, contact Authorized Representative:</p> <p>Emerson Process Management Limited at ukproductcompliance@emerson.com or +44 11 6282 23 64, Regulatory Compliance Department.</p> <p>Emerson Process Management Limited, company No 00671801, Meridian East, Leicester LE19 1UX, United Kingdom</p>	
<p>to which this declaration relates, is in conformity with:</p> <ol style="list-style-type: none"> 1) the relevant statutory requirements of Great Britain, including the latest amendments. 2) the provisions of the European Union Directives, including the latest amendments. 		
<p style="text-align: center;"> <i>Oct 17, 2022</i></p> <p style="text-align: center;">(signature & date of issue)</p>		<p>Mark Lee Vice President, Quality Boulder, CO, USA</p> <p>(name) (function) (place of issue)</p>
<p>EMC Directive (2014/30/EU) Harmonized Standards: EN 61326-1:2013</p>	<p>Electromagnetic Compatibility Regulations 2016 (S.I. 2016/1091) Designated Standards: EN 61326-1:2013</p>	
<p>Low Voltage Directive (2014/35/EU) Harmonized Standards: EN 61010-1:2010</p>	<p>Electrical Equipment (Safety) Regulations 2016 (S.I. 2016/1101) Designated Standards: EN 61010-1:2010</p>	
<p>RoHS Directive (2011/65/EU) Amended 2015/863 Harmonized Standards: IEC 63000:2018</p>	<p>The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 (S.I. 2012/3032) Designated Standards: IEC 63000:2018</p>	

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

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

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



Quick Start Guide
00825-0100-3056, Rev. AD
November 2022

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

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