

Rosemount™ 2051 Pressure Transmitter and Rosemount 2051CF Series Flow Meter

with 4–20 mA HART® and 1–5 Vdc Low
Power HART Protocol (Revision 5 and 7)



Safety messages

This guide provides basic guidelines for the Rosemount 2051 Pressure Transmitter. It does not provide instructions for configuration, diagnostics, maintenance, service, troubleshooting, explosionproof, flameproof, or intrinsically safe (IS) installations.

⚠ WARNING

Explosions could result in death or serious injury.

Installation of this transmitter in an explosive environment must be in accordance with the appropriate local, national, and international standards, codes, and practices. Review the approvals section of this manual for any restrictions associated with a safe installation.

Before connecting a handheld communicator in an explosive atmosphere, be sure that the instruments in the loop are installed in accordance with intrinsically safe or non-incendive field wiring practices.

In an explosionproof/flameproof installation, do not remove the transmitter covers when power is applied to the transmitter.

⚠ WARNING

Process leaks could result in death or serious injury.

Install and tighten process connectors before applying pressure.

Do not attempt to loosen or remove flange bolts while the transmitter is in service.

⚠ WARNING

Electrical shock can result in death or serious injury.

Avoid contact with the leads and terminals. High voltage that may be present on leads can cause electrical shock.

Before connecting a handheld communicator in an explosive atmosphere, be sure that the instruments in the loop are installed in accordance with intrinsically safe or non-incendive field wiring practices.

In an explosionproof/flameproof installation, do not remove the transmitter covers when power is applied to the transmitter.

⚠ WARNING

Physical access

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

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

⚠ WARNING

Replacement equipment or spare parts not approved by Emerson for use as spare parts could reduce the pressure retaining capabilities of the transmitter and may render the instrument dangerous.

Use only bolts supplied or sold by Emerson as spare parts.

⚠ WARNING

Improper assembly of manifolds to traditional flange can damage sensor module.

For safe assembly of manifold to traditional flange, bolts must break back plane of flange web (bolt hole) but must not contact sensor module housing.

NOTICE

The products described in this document are NOT designed for nuclear-qualified applications. Using non-nuclear qualified products in applications that require nuclear-qualified hardware or products may cause inaccurate readings. For information on Rosemount nuclear-qualified products, contact your local Emerson Sales Representative.

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1 System readiness

Note

Before installing the transmitter, confirm the correct device driver is loaded on the host systems.

1.1 Confirm HART® Revision capability

If using HART-based control or AMS, confirm the HART capability of those systems prior to transmitter installation.

Not all systems are capable of communicating with HART Revision 7 protocol. You can configure this transmitter for either HART Revision 5 or 7.

Related information

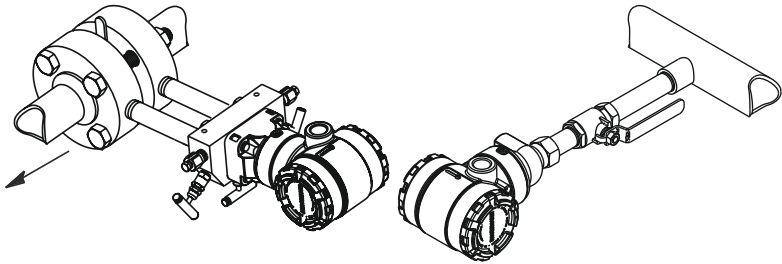
[Switch HART Revision mode](#)

1.2 Confirm correct device driver

- Verify the correct device driver (DD/DTM™) is loaded on your systems to ensure proper communications.
- Download the correct device driver at your host vendor download site, [Emerson.com/DeviceInstallKits](https://emerson.com/DeviceInstallKits), or FieldCommGroup.org.

2 Mounting the transmitter

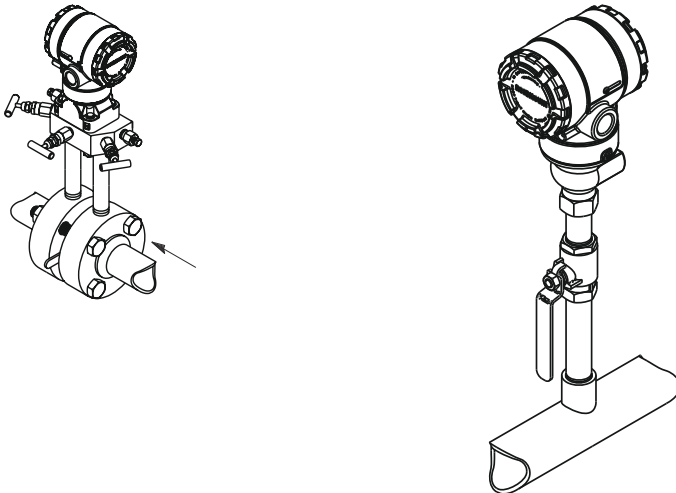
2.1 Mount the transmitter in liquid applications



Procedure

1. Place taps to the side of the line.
2. Mount the transmitter beside or below the taps.
Mount the transmitter so the drain/vent valves are oriented upward.

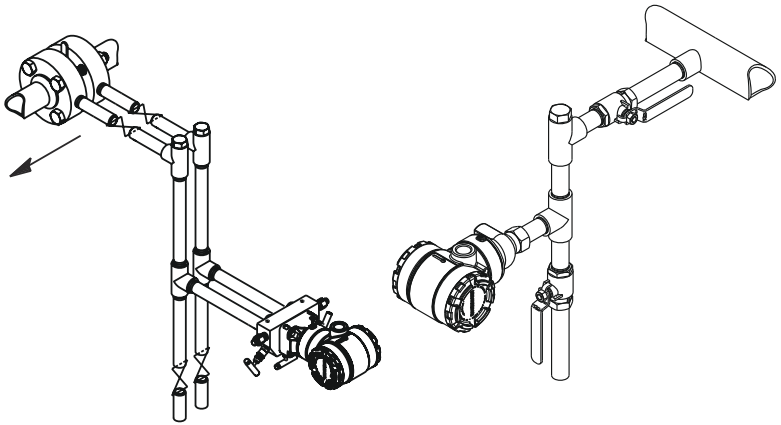
2.2 Mount the transmitter in gas applications



Procedure

1. Place taps on the top or side of the line.
2. Mount the transmitter beside or above the taps.

2.3 Mount the transmitter in steam applications

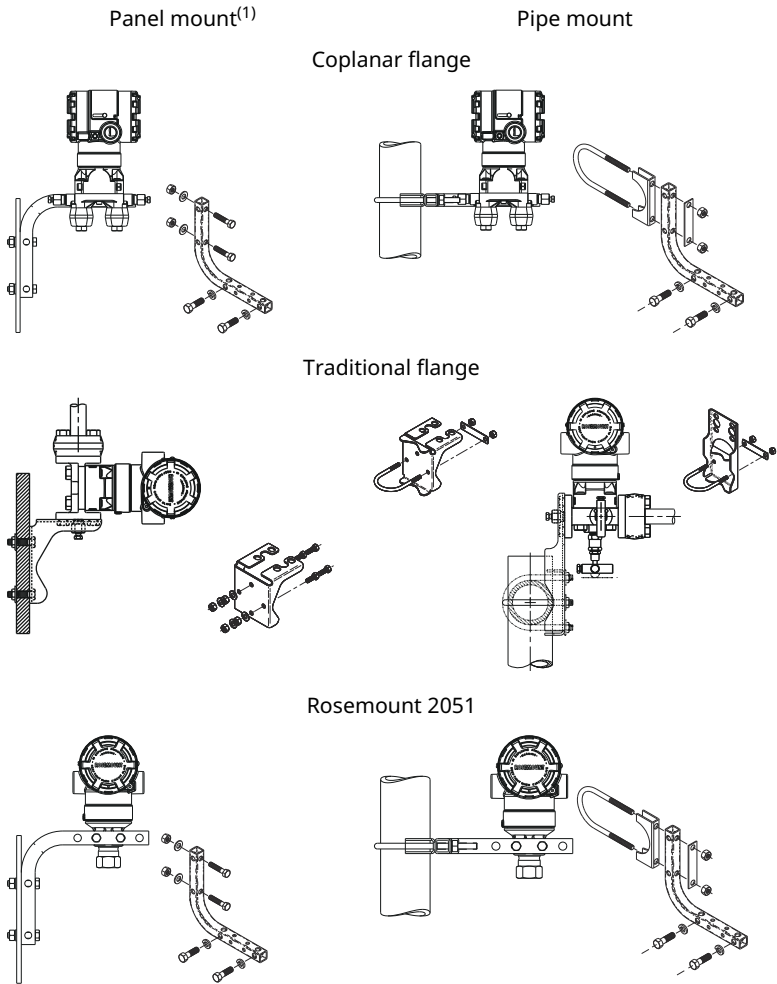


Procedure

1. Place taps to the side of the line.
2. Mount the transmitter beside or below the taps.
3. Fill impulse lines with water.

2.4 Panel and pipe mounting

Figure 2-1: Panel and pipe mounting



(1) 5/16 × 1½ panel bolts are customer supplied.

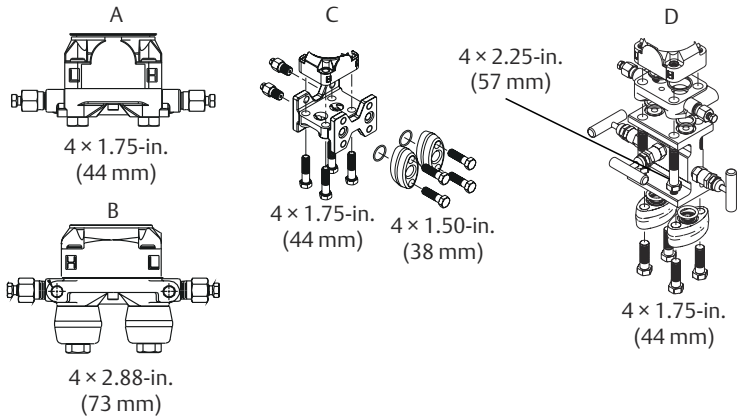
2.5 Install bolts

If the transmitter installation requires assembly of the process flanges, manifolds, or flange adapters, follow the assembly

guidelines to ensure a tight seal for optimal performance characteristics of the transmitter.

Use only bolts supplied with the transmitter or sold by Emerson as spare parts. [Figure 2-2](#) illustrates common transmitter assemblies with the bolt length required for proper transmitter assembly.

Figure 2-2: Common transmitter assemblies



- A. *Transmitter with coplanar flange*
- B. *Transmitter with coplanar flange and optional flange adapters*
- C. *Transmitter with traditional flange and optional flange adapters*
- D. *Transmitter with coplanar flange and optional manifold and flange adapters*

Bolts are typically carbon steel (CS) or stainless steel (SST). Confirm the material by viewing the markings on the head of the bolt and referencing [Table 2-1](#). If bolt material is not shown in [Table 2-1](#), contact a local Emerson representative for more information.

Carbon steel bolts do not require lubrication, and the stainless steel bolts are coated with a lubricant to ease installation. However, do not apply any additional lubricant when installing either type of bolt.


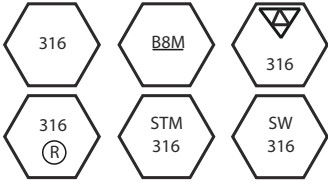
Procedure

1. Tighten the bolts by hand.
2. Torque the bolts to the initial torque value using a crossing pattern.
See [Table 2-1](#) for initial torque value.
3. Torque the bolts to the final torque value using the same crossing pattern.

See [Table 2-1](#) for final torque value.

- Verify the flange bolts are protruding through the sensor module bolt holes before applying pressure.

Table 2-1: Torque values for the flange and flange adapter bolts

Bolt material	Head markings	Initial torque	Final torque
CS		300 in.-lb.	650 in.-lb.
SST		150 in.-lb.	300 in.-lb.

2.6 O-rings

The two styles of Rosemount flange adapters (Rosemount 3051/2051/2024/3095) each require a unique O-ring (see [Figure 2-3](#)). Use only the O-ring designed for the corresponding flange adapter.

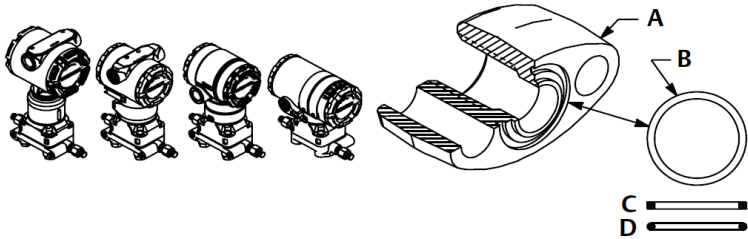
⚠ WARNING

Failure to install proper flange adapter O-rings may cause process leaks, which can result in death or serious injury.

The two flange adapters are distinguished by unique O-ring grooves. Only use the O-ring that is designed for its specific flange adapter, as shown in [Figure 2-3](#). When compressed, PTFE O-rings tend to cold flow, which aids in their sealing capabilities.

Figure 2-3: O-rings

ROSEMOUNT 3051S/3051/2051/3001/3095/2024



- A. Flange adapter
- B. O-ring
- C. PTFE based
- D. Elastomer

NOTICE

Replace PTFE O-rings if you remove the flange adapter.

2.7 Environmental seal for housing

Thread sealing (PTFE) tape or paste on male threads of conduit is required to provide a water/dust tight conduit seal and meets requirements of NEMA® Type 4X, IP66, and IP68. Consult factory if other Ingress Protection ratings are required.

For M20 threads, install conduit plugs to full thread engagement or until mechanical resistance is met.

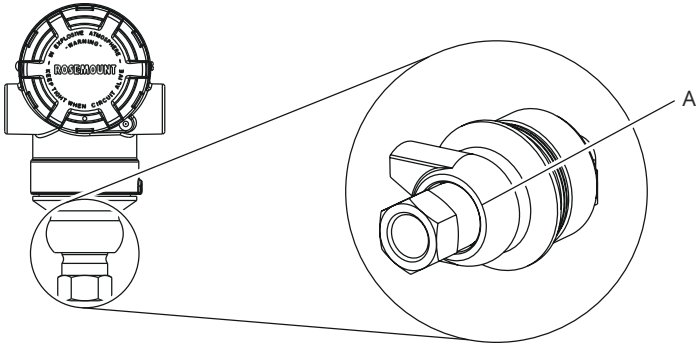
2.8 In-line gauge transmitter orientation

The low side pressure port (atmospheric reference) on the in-line gauge transmitter is located in the neck of the transmitter, behind the housing. The vent path is 360° around the transmitter between the housing and sensor.

(See [Figure 2-4](#).)

Keep the vent path free of any obstruction, including but not limited to paint, dust, and lubrication by mounting the transmitter so fluids can drain away.

Figure 2-4: In-line gauge low side pressure port



A. Pressure port location

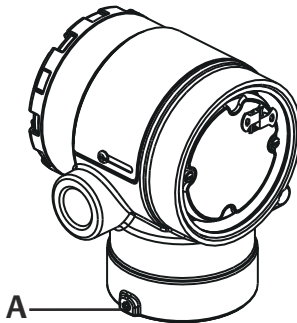
3 Rotate housing

To improve field access to wiring or to better view the optional LCD display:

Procedure

1. Loosen the housing rotation set screw using a 5/64 -in. hex wrench.

Figure 3-1: Housing rotation



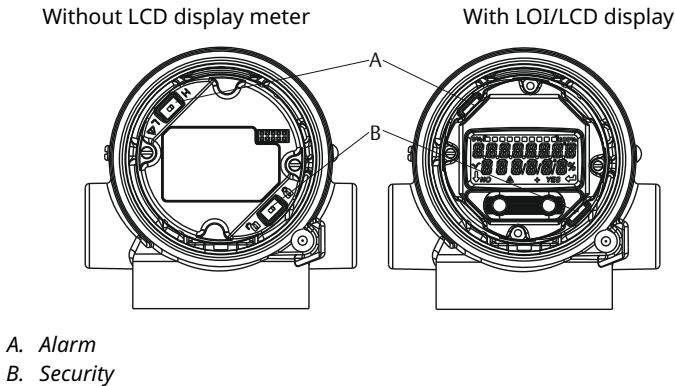
A. Housing rotation set screw (5/64-in.)

2. Rotate the housing clockwise to the desired location.
3. If the desired location cannot be achieved due to thread limitation, rotate the housing counterclockwise to the desired location (up to 360° from thread limit).
4. Retighten the housing rotation set screw to no more than 7 in.-lbs. when desired location is reached.

4 Set the switches

Set alarm and security switch configuration before installation as shown in [Figure 4-1](#).

Figure 4-1: Transmitter electronics board



- The alarm switch sets the analog output alarm to high or low.
- Default alarm is high.
- The security switch allows (🔓) or prevents (🔒) any configuration of the transmitter.
- Default security is off (🔓).

To change the switch configuration:

Procedure

1. If the transmitter is installed, secure the loop, and remove power.
2. Remove the housing cover opposite the field terminal side.

⚠ WARNING

Do not remove the instrument cover in explosive atmospheres when the circuit is live.

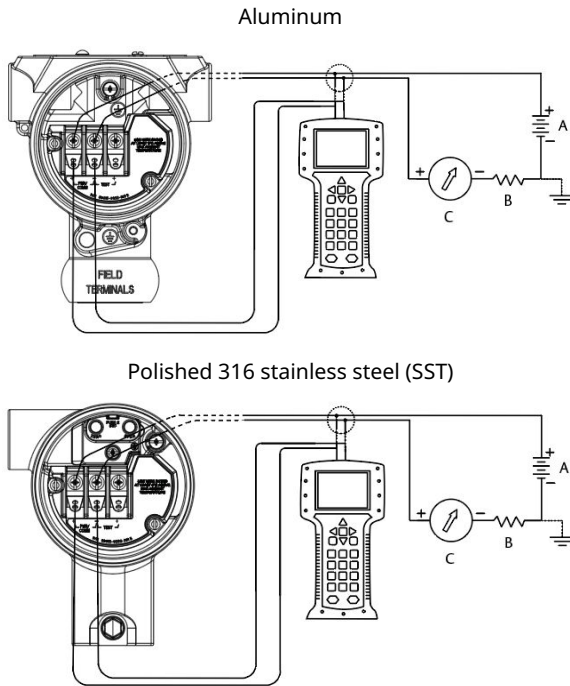
3. Slide the security and alarm switches into the preferred position using a small screwdriver.
4. Reattach the transmitter cover.

⚠ WARNING

The cover must be fully engaged to comply with explosion-proof requirements.

5 Connect the wiring and power up

Figure 5-1: Transmitter wiring diagrams (4–20 mA)



- A. 24 Vdc supply
- B. $R_L \geq 250$
- C. Current meter (optional)

Use shielded twisted pair cable for best results. Use 24 American Wire Gauge (AWG) or larger wire that does not exceed 5,000 ft. (1500 m) in length. If applicable, install wiring with a drip loop. Arrange the drip loop so the bottom is lower than the conduit connections and the transmitter housing.

⚠ WARNING

Installation of the transient protection terminal block does not provide transient protection unless the Rosemount 2051HT case is properly grounded.

Do not run signal wiring in conduit or open trays with power wiring, or near heavy electrical equipment.

Do not connect the powered signal wiring to the test terminals. Power could damage the test diode in the terminal block.

To wire the transmitter:

Procedure

1. Remove the housing cover on the FIELD TERMINALS side.
2. Connect the positive lead to the “+” terminal (PWR/COMM) and the negative lead to the “-” terminal.
3. Ensure full contact with terminal block screw and washer. When using a direct wiring method, wrap wire clockwise to ensure it is in place when tightening the terminal block screw.

NOTICE

Emerson does not recommend using a pin or a ferrule wire terminal, as the connection may be more susceptible to loosening over time or under vibration

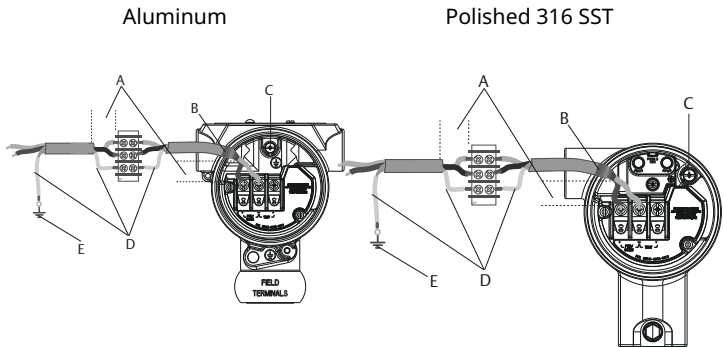
4. Ground housing to fulfill local grounding regulations.
5. Ensure proper grounding.
It is important the instrument cable shield be:
 - Trimmed close and insulated from touching the transmitter housing
 - Connected to the next shield if cable is routed through a junction box
 - Connected to a good earth ground at the power supply end
6. If transient protection is needed, refer to [Grounding for transient terminal block](#) for grounding instructions.
7. Plug and seal unused conduit connections.

8. Reattach the transmitter covers.

Emerson recommends tightening the cover until there is no gap between the cover and the housing.

The covers must only be capable of being released or removed with the aid of a tool to comply with applicable ordinary locations requirements.

Figure 5-2: Wiring



- A. *Minimize distance*
- B. *Trim shield and insulate*
- C. *Protective grounding terminal*
- D. *Insulate shield*
- E. *Connect shield back to the power supply ground*

5.1 Grounding for transient terminal block

Ground termination is provided on the outside of the electronics housing and inside the terminal compartment. These grounds are used when the transient protection terminal blocks are installed. Emerson recommends using 18 American Wire Gauge (AWG) or larger wire to connect housing ground to earth ground (internal or external).

NOTICE

The Rosemount 2051HT polished 316 stainless steel (SST) housing only provides ground termination inside the terminal compartment.

6 Verifying configuration

Verify the configuration using any HART®-capable configuration tool or local operator interface (LOI) - option code M4. Configuration instructions for a handheld communicator and LOI are included in this section.

6.1 Verify configuration with a handheld communicator

Prerequisites

Install a Rosemount 2051 device driver (DD) on the handheld communicator to verify configuration.

Fast Key sequences for the latest DD are shown in [Table 6-1](#). For Fast Key sequences using legacy DDs, contact your local Emerson representative.

NOTICE

Emerson recommends installing the latest DD to access the complete functionality. Visit [Emerson.com/FieldCommunicator](https://emerson.com/FieldCommunicator) for information on updating the DD library.

Procedure

Verify device configuration using the Fast Key sequences in [Table 6-1](#). A check (✓) indicates the basic configuration parameters. At minimum, verify these parameters as part of configuration and startup.

Table 6-1: Device Revision 9 and 10 (HART® 7), DD Revision 1 Fast Key sequence

	Function	HART 7	HART 5
✓	Alarm and Saturation Levels	2, 2, 2, 5, 7	2, 2, 2, 5, 7
✓	Damping	2, 2, 1, 1, 5	2, 2, 1, 1, 5
✓	Range Values	2, 2, 2	2, 2, 2
✓	Tag	2, 2, 7, 1, 1	2, 2, 7, 1, 1
✓	Transfer Function	2, 2, 1, 1, 6	2, 2, 1, 1, 6
✓	Units	2, 2, 1, 1, 4	2, 2, 1, 1, 4
	Burst Mode	2, 2, 5, 3	2, 2, 5, 3
	Custom Display Configuration	2, 2, 4	2, 2, 4
	Date	2, 2, 7, 1, 4	2, 2, 7, 1, 3

Table 6-1: Device Revision 9 and 10 (HART® 7), DD Revision 1 Fast Key sequence (continued)

	Function	HART 7	HART 5
	Descriptor	2, 2, 7, 1, 5	2, 2, 7, 1, 4
	Digital to Analog Trim (4–20 mA output)	3, 4, 2	3, 4, 2
	Disable Configuration Buttons	2, 2, 6, 3	2, 2, 6, 3
	Rerange with Keypad	2, 2, 2, 1	2, 2, 2, 1
	Loop Test	3, 5, 1	3, 5, 1
	Lower Sensor Trim	3, 4, 1, 2	3, 4, 1, 2
	Message	2, 2, 7, 1, 6	2, 2, 7, 1, 5
	Scaled D/A Trim (4–20 mA output)	3, 4, 2	3, 4, 2
	Sensor Temperature/Trend	3, 3, 2	3, 3, 2
	Upper Sensor Trim	3, 4, 1, 1	3, 4, 1, 1
	Digital Zero Trim	3, 4, 1, 3	3, 4, 1, 3
	Password	2, 2, 6, 5	2, 2, 6, 4
	Scaled Variable	3, 2, 2	3, 2, 2
	HART Revision 5 to HART Revision 7 switch	2, 2, 5, 2, 3	2, 2, 5, 2, 3
	Long Tag ⁽¹⁾	2, 2, 7, 1, 2	N/A
	Find Device ⁽¹⁾	3, 4, 5	N/A
	Simulate Digital Signal ⁽¹⁾	3, 4, 5	N/A

(1) Only available in HART Revision 7 mode.

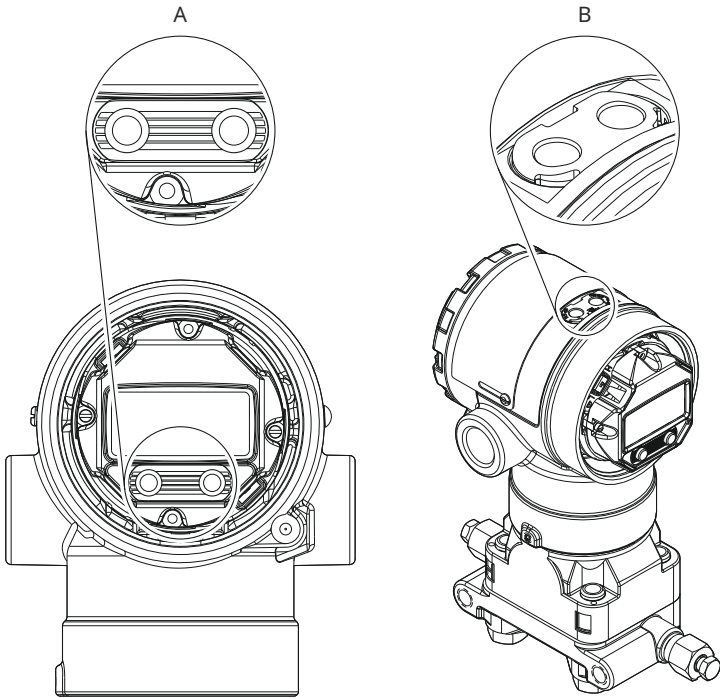
6.2 Verify configuration with local operator interface (LOI)

You can use the optional LOI to configure the device.

The LOI is a two-button design with internal and external/rear buttons. On a polished stainless steel housing, buttons are located internally both on the display and terminal side of the transmitter. On an aluminum housing, buttons are located on the display and externally underneath the top metal tag.

To activate the LOI, push any button. LOI button functionality is shown on the bottom corners of the display. See [Table 6-2](#) and [Figure 6-2](#) for button operation and menu information.

Figure 6-1: Internal and external LOI buttons



- A. Internal buttons
- B. External buttons

Table 6-2: LOI Button operation



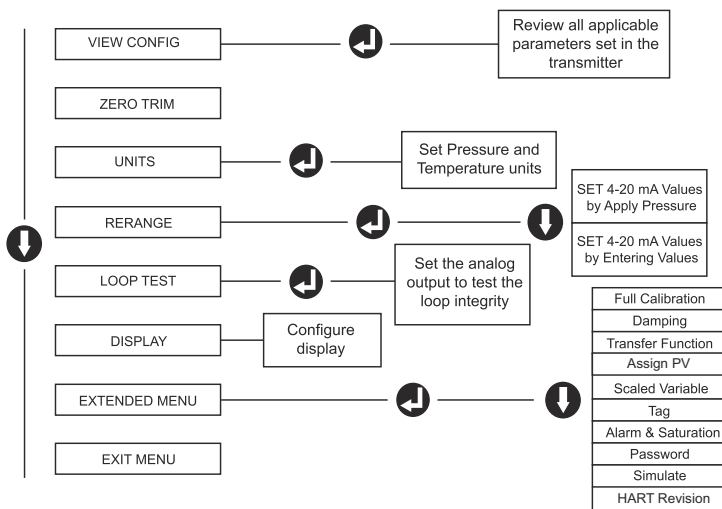
Button		
Left	No	SCROLL
Right	Yes	ENTER

Figure 6-2: LOI menu



6.3 Switch HART® Revision mode

If the HART configuration tool is not capable of communicating with HART Revision 7, the Rosemount 2051 will load a generic menu with limited capability. To switch the HART Revision mode from the generic menu:

Procedure

Navigate to **Manual Setup** → **Device Information** → **Identification** → **Message**.

- To change to HART Revision 5, enter HART5 in the Message field.
- To change to HART Revision 7, enter HART7 in the Message field.

7 Zero trim the transmitter

Emerson calibrates devices at the factory. Once you have installed the transmitter, Emerson recommends performing a zero trim on gauge transmitters to eliminate error due to mounting position or static pressure effects. You can use either a handheld communicator or configuration buttons to perform a zero trim.

NOTICE

When performing a zero trim, ensure the equalization valve is open and all wet legs are filled to the correct level.

NOTICE

Emerson does not recommend zeroing an absolute transmitter, Rosemount 2051HT Hygienic Pressure Transmitter.

Procedure

Choose your trim procedure:

- **Analog zero trim** Sets the analog output to 4 mA. Also referred to as a rerange, it sets the lower range value (LRV) equal to the measured pressure. The display and digital HART® output remains unchanged.
- **Digital zero trim** Recalibrates the sensor zero. The LRV is unaffected. The pressure value will be zero (on display and HART output). 4 mA point may not be at zero. This requires that the factory calibrated zero pressure is within a range of three percent of the upper range value (URV) [$0 \pm 3\% \times \text{URV}$].

Example

URV = 250 inH₂O

Applied Zero Pressure = $\pm 0.03 \times 250 \text{ inH}_2\text{O} = \pm 7.5 \text{ inH}_2\text{O}$ (compared to factory settings). The transmitter will reject values outside this range.

7.1 Zero trim the transmitter with a handheld communicator

Procedure

1. Connect the handheld communicator.
2. Follow the HART® menu to perform the desired zero trim.

	Analog zero (set 4 mA)	Digital zero
Fast Key sequence	3, 4, 2	3, 4, 1, 3

7.2 Zero trim the transmitter with configuration buttons

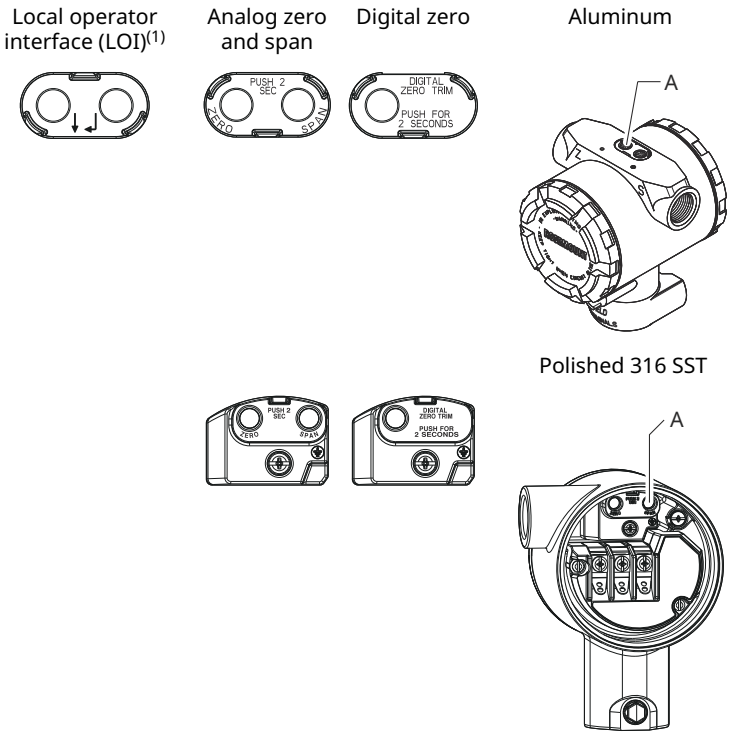
You can perform a zero trim using one of the three possible sets of configuration buttons located above the terminal block or under the top tag.

Procedure

Access the configuration buttons.

- To access the configuration buttons on a polished stainless steel (SST) housing, remove the terminal side housing cover.
- To access the configuration buttons on an aluminum housing, loosen the screw on the top tag and slide the tag on top of the transmitter.

Figure 7-1: External or rear/terminal side configuration buttons



A. Configuration buttons

(1) LOI buttons (option M4) only offer front facing buttons on SST housing (option 1). You can purchase options D4 and DZ for rear/terminal-side facing buttons.

7.2.1 Zero trim with local operator interface (LOI): option M4

Procedure

1. Set the transmitter pressure.
2. See [Figure 6-2](#) for the operating menu.
 - To perform an analog zero trim, select **Re-range**.
 - To perform a digital zero trim, select **Zero Trim**.

7.2.2 Zero trim with analog zero and span (option D4)

Procedure

1. Set the transmitter pressure.
2. Press and hold the **Zero** button for two seconds.

7.2.3 Zero trim with digital zero (option DZ)

Procedure

1. Set the transmitter pressure.
2. Press and hold the **Zero** button for two seconds.

8 Safety instrumented systems

For safety certified installations, refer to the [Rosemount 2051 Pressure Transmitter Manual](#) for installation procedure and system requirements.

9 Rosemount 2051 product certifications

Rev 1.31

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

9.2 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).

9.3 Hazardous location certification

NOTICE

Device ambient temperature ratings and electrical parameters may be limited to the levels dictated by the hazardous location certificate parameters.

9.4 North America

E5 USA Explosionproof (XP) and Dust Ignition-proof (DIP)

Certificate	2041384
Standards	FM 3600: 2022, FM 3615: 2022, FM 3616: 2022, ANSI/UL 61010-1-2019 Third Edition, ANSI/UL 12.27.01: 2022 (Fourth Edition), ANSI/UL 50E (First Edition)
Markings	XP CL I, DIV I, GP B, C, & D T5; Seal not required DIP CL II, DIV I, GP E, F, & G; CL III T5; T5: (-50 °C ≤ Ta ≤ +85 °C) Type 4X, IP 68 Optional: single seal

Specific Conditions of Use:

1. The Rosemount 2051 transmitter housing may contain aluminum and is considered a potential risk of ignition by impact or friction. Care must be taken during installation and use to prevent impact and friction.
2. Equipment evaluated for atmospheric pressure range between 80 kPa (0.8 bar) to 110 kPa (1.1 bar).
3. Process temperature limits shall be in accordance with 03031-1053.

I5 USA Intrinsic Safety (IS), Nonincendive (NI)

Certificate	2041384
Standards	FM3600: 2022, FM3610: 2021, FM3611: 2021, ANSI/UL61010-1-2019 Third Edition, ANSI/UL60079-0: 2017, ANSI/UL60079-11: 2013, ANSI/UL12.27.01: 2022 (Fourth Edition), ANSI/UL50E (First Edition)
Markings	IS: CL I GP A, B, C, D T4; CL II GP EFG; CL III T4; CL I ZN 0 AEx ia IIC T4 Ga; NI: CL I DIV 2 GP ABCD T4; (-50 °C ≤ Ta ≤ +70 °C) Install per 02051-1008. Type 4X, IP 68 Optional: single seal

Specific Conditions of Use:

1. The Model 2051 transmitter housing may contain aluminum and is considered a potential risk of ignition by impact or friction. Care must be taken during installation and use to prevent impact and friction.
2. The Model 2051 with the transient terminal block (Option code T1) will not pass the 500 VRMS dielectric strength test; this must be considered during installation.
3. Equipment evaluated for atmospheric pressure range between 80 kPa (0.8 bar) to 110 kPa (1.1 bar).
4. Maximum process temperature limits shall be in accordance with 03031-1053.

IE USA FISCO

Certificate	2041384
Standards	FM 3600: 2022, FM 3610: 2021, FM 3611: 2021, ANSI/UL 61010-1-2019 Third Edition, ANSI/UL 60079-0: 2017, ANSI/UL 60079-11: 2013, ANSI/UL 12.27.01: 2022 (Fourth Edition), ANSI/UL 50E (First Edition)
Markings	IS: CL I GP ABCD T4 CL I ZN 0 AEx ia IIC T4 Ga -50 °C ≤ Ta ≤ +60 °C FISCO Type 4X, IP 68 Install per 02051-1008 Optional: single seal

Specific Conditions of Use:

1. The Model 2051 transmitter housing may contain aluminum and is considered a potential risk of ignition by impact or friction. Care must be taken during installation and use to prevent impact and friction.
2. Equipment evaluated for atmospheric pressure range between 80 kPa (0.8 bar) to 110 kPa (1.1 bar).
3. Maximum process temperature limits shall be in accordance with 03031-1053.

E6 Canada Explosionproof, Dust Ignition-proof

Certificate	2041384
Standards	CAN/CSA C22.2 No. 61010-1-12, CAN/CSA C22.2 No. 94.2-07, CSA C22.2 No. 25-17, CAN/CSA C22.2 No. 30:20, CAN/CSA C22.2 No. 60079-0:19, CAN/CSA C22.2 No. 60079-1:16, ANSI/UL 12.27.01: 2022 (Fourth Edition)
Markings:	XP: CL I, DIV I, GP B,C, D T5; Ex db IIC T5 Gb; Seal not required DIP: CL II, DIV I, GP E, F, & G; CL III T5; -50 °C ≤ Ta ≤ +85 °C Single seal - temp limits 03031-1053 Type 4X, IP 68

Specific Conditions of Use:

1. The Model 2051 transmitter housing may contain aluminum and is considered a potential risk of ignition by impact or friction. Care must be taken during installation and use to prevent impact and friction.
2. Equipment evaluated for atmospheric pressure range between 80 kPa (0.8 bar) to 110 kPa (1.1 bar).

I6 Canada Intrinsic Safety (IS)

Certificate	2041384
Standards	C22.2 No. 61010-1-12, C22.2 No. 25-17, C22.2 No. 94.2-20 Third Edition, CSA Std C22.2 No. 213-17 + UPD 1 (2018) + UPD 2 (2019) + UPD 3 (2021), CAN/CSA-60079-0:19, CAN/CSA-60079-11:14, ANSI/UL 122701: 2022 (Fourth Edition), ANSI/UL 50E (First Edition)
Markings	IS: CL I GP A, B, C, D T4; CL II GP E, F, G, CL III T4; Ex ia IIC T4 Ga; NI: CL I DIV 2 GP A, B, C, D -50 °C ≤ Ta ≤ +70 °C Install per 02051-1008 Single seal - temp limits per 03031-1053 Type 4X, IP 68

Specific Conditions of Use:

1. The Model 2051 transmitter housing may contain aluminum and is considered a potential risk of ignition by impact or friction. Care must be taken during installation and use to prevent impact and friction.
2. The Model 2051 with the transient terminal block (Option code T1) will not pass the 500 VRMS dielectric strength test; this must be considered during installation.
3. Equipment evaluated for atmospheric pressure range between 80 kPa (0.8 bar) to 110 kPa (1.1 bar).

IF Canada FISCO

Certificate	2041384
Standards	C22.2 No. 61010-1-12, C22.2 No. 25-17, C22.2 No. 94.2-20 Third Edition, CSA Std C22.2 No. 213-17 +

UPD 1 (2018) + UPD 2 (2019) + UPD 3 (2021), CAN/CSA-60079-0:19, CAN/CSA-60079-11:14, ANSI/UL 12.27.01:2022 (Fourth Edition), ANSI/UL 50E (First Edition)

Markings: IS: CL I GP ABCD T4;
Ex ia IIC T4 Ga
-50 °C ≤ Ta ≤ +60 °C
FISCO
Install per 02051-1008
Single seal - temp limits per 03031-1053
Type 4X, IP 68

Specific Conditions of Use:

1. The Model 2051 transmitter housing may contain aluminum and is considered a potential risk of ignition by impact or friction. Care must be taken during installation and use to prevent impact and friction.
2. Equipment evaluated for atmospheric pressure range between 80 kPa (0.8 bar) to 110 kPa (1.1 bar).

9.5 Europe

E1 ATEX/UKEX Flameproof

ATEX Certificate KEMA 08ATEX0090X

UKEX Certificate DEKRA 21UKEX0288X

Standards EN IEC 60079-0: 2018, EN 60079-1: 2014, EN 60079-26: 2015


Markings:  II 1/2 G Ex db IIC Ga/Gb T6 (-60 °C ≤ Ta ≤ +70 °C), T4/T5 (-60 °C ≤ Ta ≤ +80 °C)

Table 9-1: Process connection temperature

Temperature class	Process connection temperature	Ambient temperature
T6	-60 °C to +70 °C	-60 °C to +70 °C
T5	-60 °C to +80 °C	-60 °C to +80 °C
T4	-60 °C to +120 °C	-60 °C to +80 °C

Special Conditions for Safe Use (X):

1. Appropriate cable, glands, and plugs need to be suitable for a temperature of 5 °C greater than maximum specified temperature for location where installed.
2. Non-standard paint options may cause risk from electrostatic discharge. Avoid installations that could cause electrostatic build-up on painted surfaces and only clean the painted surfaces with a damp cloth. If paint is ordered through a special option code, contact the manufacturer for more information.
3. This device contains a thin wall diaphragm less than 1 mm thick that forms a boundary between Category 1G (process connection) and Category 2G (all other parts of the equipment). The model code and datasheet are to be consulted for details of the diaphragm material. During installation, maintenance, and use, the environmental conditions to which the diaphragm will be subjected shall be taken into account. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.
4. Flameproof joints are not intended for repair.

Conduit/cable entries

Unless otherwise marked, the conduit/cable entries in the housing enclosure use a ½-14 NPT form. Only use plugs, adapters, glands, or conduit with a compatible thread form when closing these entries. Entries marked M20 are M20 x 1.5 thread form. On devices with multiple conduit entries, all entries will have the same thread form. When installing in a hazardous location, use only appropriately listed or Ex certified plugs, glands, or adapters in cable/conduit entries.

I1 ATEX Intrinsic Safety

Certificate	Baseefa08ATEX0129X
Standards	EN IEC 60079-0: 2018, EN60079-11: 2012
Markings	Ⓔ II 1 G Ex ia IIC T4 Ga (-60 °C ≤ Ta ≤ +70 °C)

Table 9-2: Input parameters

	HART®	Fieldbus/PROFIBUS®
Voltage U_i	30 V	30 V
Current I_i	200 mA	300 mA
Power P_i	1 W	1.3 W
Capacitance C_i	0.012 μ F	0 μ F
Inductance L_i	0 mH	0 mH

Special Conditions for Safe Use (X):

1. If the equipment is fitted with an optional 90 V transient suppressor, it is incapable of withstanding the 500 V isolation from earth test, and this must be taken into account during installation.
2. The enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in Zone 0.

IA ATEX FISCO

Certificate	Baseefa08ATEX0129X
Standards	EN IEC 60079-0: 2018, EN60079-11: 2012
Markings	Ⓔ II 1 G Ex ia IIC T4 Ga (-60 °C ≤ Ta ≤ +60 °C)

Table 9-3: Input parameters

	FISCO
Voltage U_i	17.5 V
Current I_i	380 mA
Power P_i	5.32 W
Capacitance C_i	0 μ F
Inductance L_i	0 mH

Special Conditions for Safe Use (X):

1. If the equipment is fitted with an optional 90 V transient suppressor, it is incapable of withstanding the 500 V isolation from earth test, and this must be taken into account during installation.

- The enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in Zone 0.

N1 ATEX Type n

Certificate	Baseefa08ATEX0130X
Standards	EN IEC 60079-0: 2018, EN60079-15: 2010
Markings	⊕ II 3 G Ex nA IIC T4 Gc (-40 °C ≤ Ta ≤ +70 °C)

Special Conditions for Safe Use (X):

- If the equipment is fitted with an optional 90 V transient suppressor, it is incapable of withstanding the 500 V electrical strength test as defined in clause 6.5.1 of by EN 60079-15: 2010. This must be taken into account during installation.

ND ATEX Dust

Certificate	Baseefa08ATEX0182X
Standards	EN IEC 60079-0: 2018, EN60079-31: 2014
Markings	⊕ II 1 D Ex ta IIIC T ₅₀₀ 105 °C Da (-20 °C ≤ Ta ≤ +85 °C)

Special Conditions for Safe Use (X):

- If the equipment is fitted with an optional 90 V transient suppressor, it is incapable of withstanding the 500 V isolation from earth test, and this must be taken into account during installation.
- Variants with a paint finish must not be installed in a dust-laden airflow.
- Non-standard paint options may cause risk from electrostatic discharge. Avoid installations that could cause electrostatic build-up on painted surfaces and only clean the painted surfaces with a damp cloth. If paint is ordered through a special option code, contact the manufacturer for more information.

9.6 International

E7 IECEx Flameproof

Certificate	IECExKEM08.0024X
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Standards	IEC 60079-0: 2017, IEC 60079-1: 2014-06, IEC 60079-26: 2014-10
Markings	Ex db IIC T6...T4 Ga/Gb T6 (-60 °C ≤ Ta ≤ +70 °C), T4/T5 (-60 °C ≤ Ta ≤ +80 °C)

Table 9-4: Process connection temperature

Temperature class	Process connection temperature	Ambient temperature
T6	-60 °C to +70 °C	-60 °C to +70 °C
T5	-60 °C to +80 °C	-60 °C to +80 °C
T4	-60 °C to +120 °C	-60 °C to +80 °C

Special Conditions for Safe Use (X):

1. This device contains a thin wall diaphragm less than 1 mm thick that forms a boundary between EPL Ga (process connection) and EPL Gb (all other parts of the equipment). The model code and datasheet are to be consulted for details of the diaphragm material. During installation, maintenance, and use, the environmental conditions to which the diaphragm will be subjected shall be taken into account. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.
2. Appropriate cable, glands, and plugs need to be suitable for a temperature of 5 °C greater than maximum specified temperature for location where installed.
3. Flameproof joints are not intended for repair.
4. Non-standard paint options may cause risk from electrostatic discharge. Avoid installations that could cause electrostatic build-up on painted surfaces and only clean the painted surfaces with a damp cloth. If paint is ordered through a special option code, contact the manufacturer for more information.

Conduit/cable entries

Unless otherwise marked, the conduit/cable entries in the housing enclosure use a ½-14 NPT form. Only use plugs, adapters, glands, or conduit with a compatible thread form when closing these entries. Entries marked M20 are M20 x 1.5 thread form. On devices with multiple conduit entries, all entries will have the same thread form. When installing in a hazardous location, use only appropriately listed or Ex certified plugs, glands, or adapters in cable/conduit entries.

I7 IECEx Intrinsic Safety

Certificate IECEx BAS 08.0045X
Standards IEC 60079-0: 2017, IEC 60079-11: 2011
Marking: Ex ia IIC T4 Ga (-60 °C ≤ Ta ≤ +70 °C)

Table 9-5: Input parameters

	HART®	Fieldbus/PROFIBUS®
Voltage U_i	30 V	30 V
Current I_i	200 mA	300 mA
Power P_i	1 W	1.3 W
Capacitance C_i	12 nF	0 μF
Inductance L_i	0 mH	0 mH

Special Conditions for Safe Use (X):

1. If the equipment is fitted with an optional 90 V transient suppressor, it is incapable of withstanding the 500 V isolation from earth test, and this must be taken into account during installation.
2. The enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in Zone 0.
3. The equipment contains thin wall diaphragms. The installation, maintenance, and use shall take into account the environmental conditions to which the diaphragms will be subjected. The manufacturer’s instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.

IG IECEx FISCO

Certificate IECEx BAS 08.0045X
Standards IEC 60079-0: 2017, IEC60079-11: 2011
Markings Ex ia IIC T4 Ga (-60 °C ≤ Ta ≤ +60 °C)

Table 9-6: Input parameters

	FISCO
Voltage U_i	17.5 V
Current I_i	380 mA
Power P_i	5.32 W
Capacitance C_i	0 nF
Inductance L_i	0 μ H

Special Conditions for Safe Use (X):

1. If the equipment is fitted with an optional 90 V transient suppressor, it is incapable of withstanding the 500 V isolation from earth test, and this must be taken into account during installation.
2. The enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in Zone 0.
3. The equipment contains thin wall diaphragms. The installation, maintenance, and use shall take into account the environmental conditions to which the diaphragms will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.

N7 IECEx Type n

Certificate	IECEX BAS 08.0046X
Standards	IEC 60079-0: 2017, IEC60079-15: 2010
Markings	Ex nA IIC T4 Gc (-40 °C ≤ Ta ≤ +70 °C)

Special Conditions for Safe Use (X):

1. If fitted with a 90 V transient suppressor, the equipment is not capable of withstanding the 500 V electrical strength test as defined in clause 6.5.1 of IEC60079-15: 2010. This must be taken into account during installation.

9.7 Brazil**E2 Brazil Flameproof**

Certificate	UL-BR 14.0375X (Sorocaba, Sao Pao Paulo, Brazil), UL-BR22.3806X (Shakopee, MN, USA)
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	UL-BR22.3807X (Singapore)
Standards	ABNT NBR IEC 60079-0, ABNT NBR IEC 60079-1, ABNT NBR IEC 60079-26
Markings:	Ex db IIC T6...T4 Ga/Gb IP66, T6 (-60 °C ≤ Ta ≤ +70 °C), T4/T5 (-60 °C ≤ Ta ≤ +80 °C)

Special Conditions for Safe Use (X):

1. This device contains a thin wall diaphragm with less than 1 mm thickness that forms a boundary between zone 0 (process connection) and zone 1 (all other parts of the equipment). The model code and datasheet are to be consulted for details of the diaphragm material. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.
2. Flameproof joints are not intended for repair.
3. Non-standard paint options may cause risk from electrostatic discharge. Avoid installations that could cause electrostatic build-up on painted surfaces and only clean the painted surfaces with a damp cloth. If paint is ordered through a special option code, contact the manufacturer for more information.

I2 Brazil Intrinsic Safety

Certificate	UL-BR 14.0759X
Standards	ABNT NBR IEC 60079-0: 2013; ABNT NBR IEC 60079-11: 2013
Markings	Ex ia IIC T4 Ga (-60 °C ≤ Ta ≤ +70 °C)

Table 9-7: Input parameters

	HART®	Fieldbus/PROFIBUS®
Voltage U _i	30 V	30 V
Current I _i	200 mA	300 mA
Power P _i	1 W	1.3 W
Capacitance C _i	12 nF	0
Inductance L _i	0	0

Special Conditions for Safe Use (X):

1. If the equipment is fitted with an optional 90 V transient suppressor, it is incapable of withstanding the 500 V insulation from earth test, and this must be taken into account during installation.
2. The enclosure may be made of aluminum alloy and given a protective polyurethane finish; however, care should be taken to protect it from impact and abrasion when located in atmospheres that require EPL Ga.

IB Brazil FISCO

- Certificate** UL-BR 14.0759X
- Standards** ABNT NBR IEC 60079-0: 2008 + Errata 1: 2011;
ABNT NBR IEC 60079-11: 2009
- Markings** Ex ia IIC T4 Ga (-60 °C ≤ Ta ≤ +60 °C)

Table 9-8: Input parameters

	FISCO
Voltage U_i	17.5 V
Current I_i	380 mA
Power P_i	5.32 W
Capacitance C_i	0 nF
Inductance L_i	0 μH

Special Conditions for Safe Use (X):

1. If the equipment is fitted with an optional 90 V transient suppressor, it is incapable of withstanding the 500 V insulation from earth test, and this must be taken into account during installation.
2. The enclosure may be made of aluminum alloy and given a protective polyurethane finish; however, care should be taken to protect it from impact and abrasion when located in atmospheres that require EPL Ga.

9.8 China

China Flameproof

- Certificate** GYJ23.1236X; GYJ20.1485X [Flow meters]
- Standards** GB/T 3836.1-2021 ,GB/T 3836.2-2021, GB 3836.20-2010

Markings Pressure transmitter: Ex db IIC T6...T4 Ga/Gb
 Flow meter: Ex d II C T6~T4 Ga/Gb

I3 China Intrinsic Safety

Certificate GYJ22.1834X; GYJ20.1487X [Flow meters]

Standards GB3/T 3836.1-2021, GB/T 3836.4-2021, GB3836.20-2010

Markings Ex ia IIC T4 Ga, FISCO :Ex iaIICT4 Ga, Ex db+ib/ibIICT4 Ga/Gb

9.9 Korea

EP Korea Flameproof

Certificate 12-KB4BO-0342X, 12-KB4BO-0344X, 19-KB4BO-0978X

Markings Ex d IIC T6...T4 Ga/Gb, T4/T5 (-60 °C ≤ Ta ≤ +80 °C), T6 (-60 °C ≤ Ta ≤ +70 °C)

Special Conditions for Safe Use (X):

See certificate for special conditions.

IP Korea Intrinsic Safety

Certificate 12-KB4BO-0343X, 12-KB4BO-0345X, 13-KB4BO-0205X, 13-KB4BO-0207X, 18-KA4BO-0309X

Markings Ex ia IIC T4 (-60 °C ≤ Ta ≤ +70 °C)

Special Conditions for Safe Use (X):

See certificate for special conditions.

9.10 Japan

E4 Japan Flameproof

Certificate CML20JPN112X

Markings Ex db IIC T6...T4 Ga/Gb, T6 (-60 °C ≤ Ta ≤ +70 °C), T5/T4 (-60 °C ≤ Ta ≤ +80 °C)

Special Conditions for Safe Use (X):

1. This device contains a thin wall diaphragm less than 1 mm thick that forms a boundary between EPL Ga (process connection) and EPL Gb (all other parts of the equipment). The model code and datasheet are to be consulted for details of

the diaphragm material. During installation, maintenance, and use, the environmental conditions to which the diaphragm will be subjected shall be taken into account. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.

2. Flameproof joints are not intended for repair.
3. Non-standard paint options may cause risk from electrostatic discharge. Avoid installations that could cause electrostatic build-up on painted surfaces and only clean the painted surfaces with a damp cloth. If paint is ordered through a special option code, contact the manufacturer for more information.

9.11 EAC

EM EAC Flameproof

Certificate	EAЭEC KZ 7500525.01.01.00647
Markings	Ga/Gb Ex db IIC T4...T6 X, T4/T5 (-60 °C ≤ Ta ≤ +80 °C), T6 (-60 °C ≤ Ta ≤ +70 °C)

Special Conditions for Safe Use (X):

See certificate for special conditions.

IM EAC Intrinsically Safe

Certificate	EAЭEC KZ 7500525.01.01.00647
Markings	0Ex ia IIC T4 Ga X (-60 °C ≤ Ta ≤ +70 °C)

Special Conditions for Safe Use (X):

See certificate for special conditions.

9.12 Combinations

K1	Combination of E1, I1, N1, and ND
K2	Combination of E2 and I2
K5	Combination of E5 and I5
K6	Combination of E6 and I6
K7	Combination of E7, I7, N7, and IECEx Dust

IECEx Dust

Certificate	IECEx BAS 08.0058X
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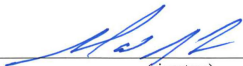
Standards	IEC60079-0: 2011, IEC60079-31: 2008
Markings	Ex ta IIIC T95 °C T500 105 °C Da (-20 °C ≤ Ta ≤ +85 °C)

Special Conditions for Safe Use (X):

1. If the equipment is fitted with an optional 90 V transient suppressor, it is incapable of withstanding a 500 V isolation from earth test, and this must be taken into account during installation.

KA	Combination of E1, I1, and K6
KB	Combination of K5 and K6
KC	Combination of E1, I1, and K5
KD	Combination of K1, K5, and K6
KP	Combination of EP and IP
KM	Combination of EM and IM

9.14 Declaration of Conformity

	<h3>EU Declaration of Conformity</h3> <p>No: RMD 1071 Rev. U</p>	
<p>We,</p> <p style="margin-left: 40px;">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™ Model 2051 Pressure Transmitter</p> <p>manufactured by,</p> <p style="margin-left: 40px;">Rosemount, Inc. 6021 Innovation Blvd. Shakopee, MN 55379 USA</p> <p>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.</p> <p>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.</p>		
 <hr/> <p>(signature)</p>	<p>Vice President of Global Quality</p> <hr/> <p>(function)</p>	
<p>Mark Lee</p> <hr/> <p>(name)</p>	<p>June 14, 2023</p> <hr/> <p>(date of issue & place)</p>	
<p>Page 1 of 3</p>		



EU Declaration of Conformity



No: RMD 1071 Rev. U

EMC Directive (2014/30/EU)

Harmonized Standards:

EN 61326-1:2013, EN 61326-2-3:2013

PED Directive (2014/68/EU)

Rosemount 2051CD2, 3, 4, 5 (also with P9 option)

QS Certificate of Assessment - Certificate No. 12698-2018-CE-ACCREDIA

Module H Conformity Assessment

Other Standards Used:

ANSI / ISA 61010-1:2004

All other Rosemount 2051 Pressure Transmitters

Sound Engineering Practice

Transmitter Attachments: Diaphragm Seal, Process Flange, or Manifold

Sound Engineering Practice

Rosemount 2051CFx DP Flowmeter

See DSI 1000 Declaration of Conformity

ATEX Directive (2014/34/EU)

Baseefa08ATEX0129X - Intrinsic Safety Certificate

Equipment Group II Category 1 G

Ex ia IIC T4 Ga

Equipment Group II Category 1/2 G

Ex db+ib/ib IIC T4 Ga/Gb

Harmonized Standards Used:

EN IEC 60079-0:2018, EN 60079-1:2014, EN 60079-11:2012,
EN 60079-26:2015

Baseefa08ATEX0130X - Type n Certificate

Equipment Group II Category 3 G

Ex nA IIC T4 Gc

Harmonized Standards Used:

EN IEC 60079-0:2018, EN 60079-15:2010

KEMA08ATEX0090X - Flameproof Certificate

Equipment Group II Category 1/2 G

Ex db IIC T6...T4 Ga/Gb

Harmonized Standards Used:

EN IEC 60079-0:2018, EN 60079-1:2014; EN 60079-26:2015



EU Declaration of Conformity



No: RMD 1071 Rev. U

Baseefa08ATEX0182X - Dust Certificate

Equipment Group II Category 1 D

Ex ta IIIC T₃₀₀105°C Da

Harmonized Standards Used:

EN IEC 60079-0:2018, EN 60079-31:2014

RoHS Directive (2011/65/EU)

Model 2051 with 4-20 mA HART protocol only (output code A)

Harmonized Standards:

EN 50581:2012

PED Notified Body

DNV GL Business Assurance Italia S.r.l. [Notified Body Number: 0496]

Via Energy Park, 14, N-20871

Vimercate (MB), Italy

ATEX Notified Bodies

DEKRA [Notified Body Number: 0344]

Utrechtseweg 310, 6812 AR Arnhem

P.O. Box 5185, 6802 ED Arnhem

The Netherlands

Postbank 6794687

SGS FIMKO OY [Notified Body Number: 0598]

Takomotie 8

FI-00380 Helsinki,

Finland

ATEX Notified Body for Quality Assurance

SGS FIMKO OY [Notified Body Number: 0598]

Takomotie 8

FI-00380 Helsinki,

Finland

9.15 China RoHS

有害物质成分表
03031-9021, Rev AB

罗斯蒙特产品型号 2051
3/29/2011

含有China RoHS管控物质超过最大浓度限值的部件型号列表 2051
List of 2051 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	○	○	○	○	○
壳体组件 Housing Assembly	○	○	○	○	○	○
传感器组件 Sensor Assembly	X	○	○	○	○	○

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.

○: 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 端子块组件 Terminal Block Assemblies 升级套件 Upgrade Kits 液晶显示屏或本地操作界面 LCD or LOI Display
壳体组件 Housing Assembly	电子外壳 Electrical Housing
传感器组件 Sensor Assembly	传感器模块 Sensor Module



Quick Start Guide
00825-0100-4107, Rev. FF
October 2023

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

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