

Rosemount™ 3051 Pressure Transmitter and Rosemount 3051CF Series Flow Meters

with 4-20 mA HART® Revision 5 and 7
Protocol



HART 
COMMUNICATION PROTOCOL



Scan here for product documentation
and drawings.

Safety messages

Note

Before installing the transmitter, confirm the correct device driver is loaded on the host systems. See [System readiness](#).

NOTICE

This guide provides basic guidelines for Rosemount 3051 Transmitters. It does not provide instructions for configuration, diagnostics, maintenance, service, troubleshooting, Explosion-proof, Flameproof, or intrinsically safe (I.S.) installations. Refer to Rosemount 3051 HART Revision 5 and 7 [Reference Manual](#) for more instructions. This manual is also available electronically at Emerson.com/Rosemount.

⚠ WARNING

Explosions

Explosions could result in death or serious injury.

Installation of device in an explosive environment must be in accordance with appropriate local, national, and international standards, codes, and practices. Review [Product certifications](#) for any restrictions associated with a safe installation.

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

In an explosion-proof/flameproof installation, do not remove the transmitter covers when power is applied to the unit.

Process leaks

Process leaks may cause harm or result in death.

To avoid process leaks, only use the O-ring designed to seal with the corresponding flange adapter.

Electrical shock

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.

Physical access

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

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

⚠ CAUTION

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.

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1 System readiness

1.1 Confirm HART Revision capability

- If using HART based control or asset management systems, confirm the HART capability of those systems prior to transmitter installation. Not all systems are capable of communicating with HART Revision 7 protocol. This transmitter can be configured for either HART Revision 5 or 7.
- For instructions on how to change the HART Revision of your transmitter, see [Switch HART Revision mode](#).

1.2 Confirm correct device driver

- Verify the latest Device Driver (DD/DTM™) is loaded on your systems to ensure proper communications.
- Download the latest DD at Emerson.com or FieldCommGroup.org
- In the **Browse by Member** dropdown menu, select Rosemount business unit of Emerson™.
- Select desired product.

Table 1-1: Rosemount 3051 Device Revisions and Files

Release date	Device identification			Device driver identification		Review instructions	Review functionality
	NAMUR software revision ⁽¹⁾	HART hardware revision ⁽¹⁾	HART software revision ⁽²⁾	HART universal revision	Device revision ⁽³⁾	Manual document number	Change description
April 2012	1.0xx	1.0xx	01	7	10	00809-0100-4007	⁽⁴⁾
				5	9		
January 1998	N/A	N/A	178	5	3	00809-0100-4001	N/A

- (1) NAMUR Revision is located on the hardware tag of the device. Differences in level 3 changes, signified above by xx, represent minor product changes as defined per NES3. Compatibility and functionality are preserved, and you can use the product interchangeably.
- (2) You can read the HART software revision with a HART capable configuration tool. Value shown is minimum revision that could correspond to NAMUR Revisions.
- (3) Device Driver file names use Device and DD Revision, e.g., 10_01. HART Protocol is designed to enable legacy device driver revisions to continue to communicate with new HART devices. To access new functionality, you must download the new Device Driver. Emerson recommends downloading new Device Driver files to ensure full functionality.
- (4) HART Revision 5 and 7 selectable, power diagnostics, safety certified, LOI, process alerts, scaled variable, configurable alarms, expanded engineering units.

2 Transmitter installation

2.1 Mount the transmitter

Figure 2-1: Panel Mount Coplanar Flange

5/16 x 1½ panel bolts are customer supplied.

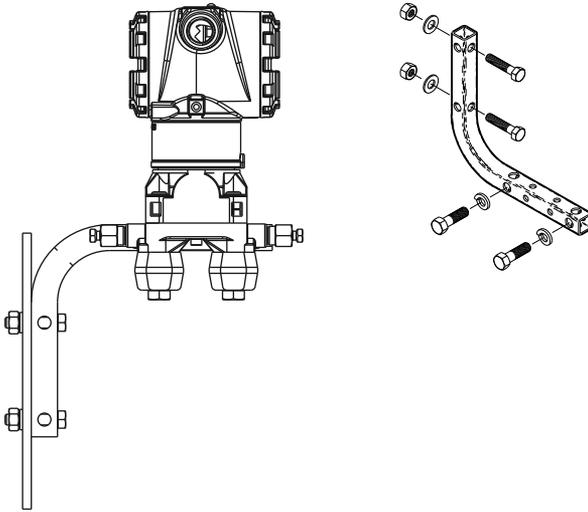


Figure 2-2: Pipe Mount Coplanar Flange

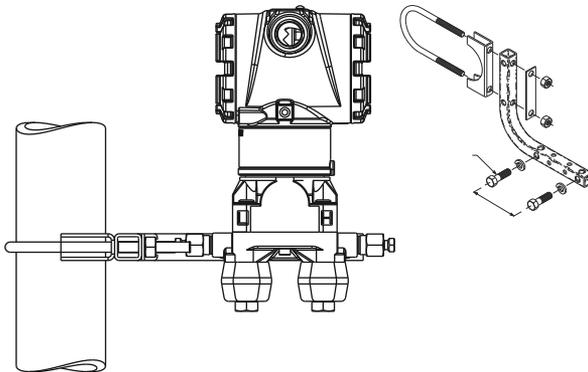


Figure 2-3: Panel Mount Traditional Flange

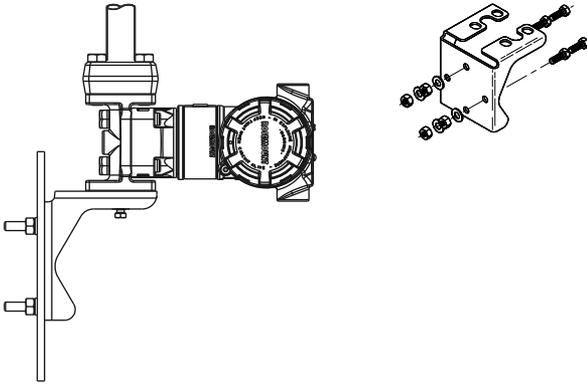


Figure 2-4: Pipe Mount Traditional Flange

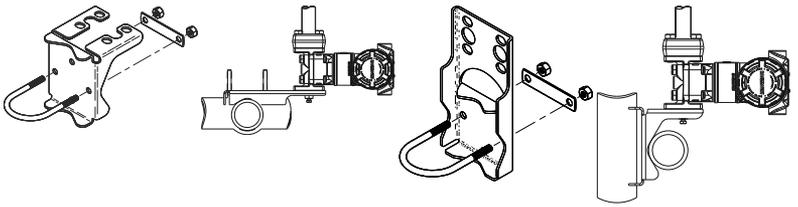


Figure 2-5: Panel Mount Rosemount 3051T

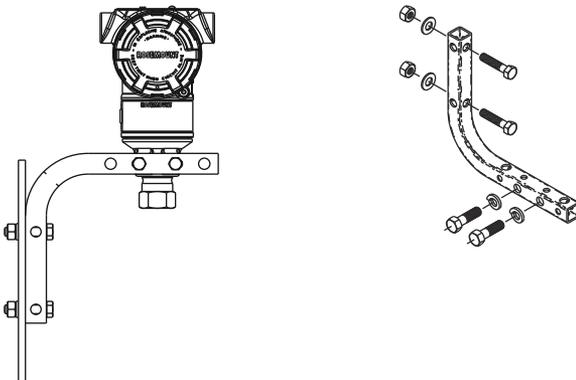
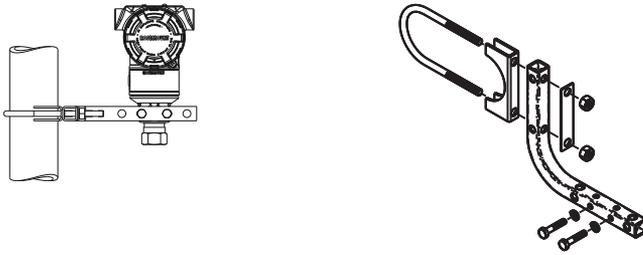


Figure 2-6: Pipe Mount Rosemount 3051T



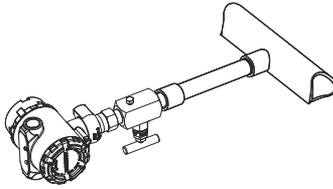
2.1.1 Mount the transmitter in liquid applications

Procedure

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

Figure 2-7: Mounting the Transmitter in Liquid Applications

In-line



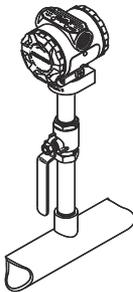
2.1.2 Mount the transmitter in gas applications

Procedure

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

Figure 2-8: Mounting the Transmitter in Gas Applications

In-line



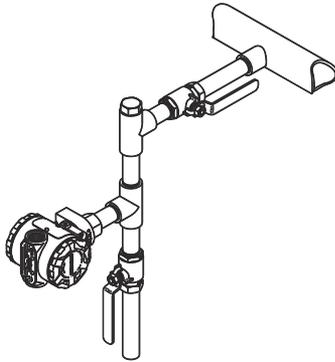
2.1.3 Mount the transmitter in steam applications

Procedure

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

Figure 2-9: Mounting the Transmitter in Steam Applications

In-line

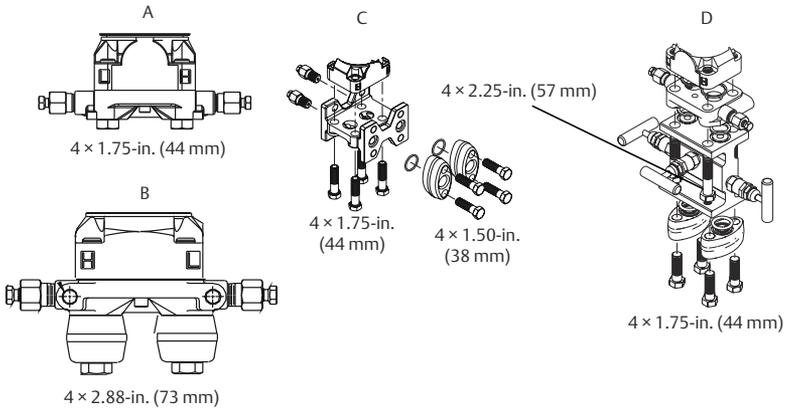


2.1.4 Bolting consideration

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 transmitters.

Use only bolts supplied with the transmitter or sold by Emerson as spare parts. [Figure 2-10](#) illustrates common transmitter assemblies with the bolt length required for proper transmitter assembly.

Figure 2-10: 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 or stainless steel. 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 additional lubricant when installing either type of bolt.

Table 2-1: Torque Values for the Flange and Flange Adapter Bolts

Bolt material	Head markings	Initial torque	Final torque
Carbon Steel (CS)		300 in-lb	650 in-lb
Stainless Steel (SST)		150 in-lb	300 in-lb

Use the following bolt installation procedure:

Procedure

1. Use the fingers to tighten the bolts.
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.
4. Verify the flange bolts are protruding through the sensor module bolt holes before applying pressure.

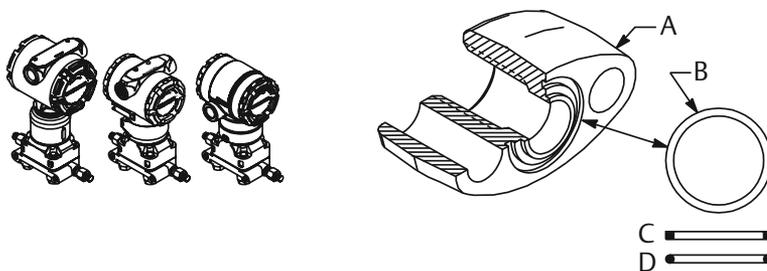
2.1.5 O-rings with flange adapters

⚠ 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 below.

Figure 2-11: O-ring Location

Rosemount 3051S/3051/2051



- A. Flange adapter
- B. O-ring
- C. PTFE-based profile (square)
- D. Elastomer profile (round)

Whenever the flanges or adapters are removed, visually inspect the O-rings. Replace them if there are any signs of damage, such as nicks or cuts. If you replace the O-rings, re-torque the flange bolts and alignment screws after installation to compensate for seating of the PTFE O-ring.

2.1.6 Environmental seal for housing

For NEMA® 4X, IP66, and IP68 requirements, use thread sealing (PTFE) tape or paste on male threads of conduit to provide a water and dust tight seal. Consult factory if other ingress protection ratings are required.

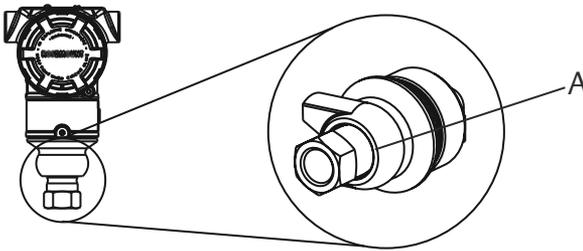
For M20 threads, install conduit plugs to full thread engagement or until mechanical resistance is met.

2.1.7 Inline gage transmitter orientation

The low side pressure port (atmospheric reference) on the inline gage transmitter is located in the neck of the transmitter, behind the housing. The vent path is 360 degrees around the transmitter between the housing and sensor (see [Figure 2-12](#)).

Keep the vent path free of any obstruction, such as paint, dust, and lubrication, by mounting the transmitter so that the process can drain away.

Figure 2-12: Inline Gage Low Side Pressure Port



A. Low side pressure port (atmospheric reference)

2.1.8 Install high pressure coned and threaded connection

The transmitter comes with an autoclave connection designed for pressure applications. Follow the steps below to properly connect the transmitter to your process.

Procedure

1. Apply a process-compatible lubricant to the gland nut threads.
2. Slip the gland nut onto the tube; then thread the collar onto the tube end.
The collar is reverse threaded.
3. Apply a small amount of process-compatible lubricant to the tube cone to help prevent galling and facilitate sealing. Insert the tubing into the connection and use the fingers to tighten the bolts.
4. Tighten the gland nut to a torque of 25 ft-lb.

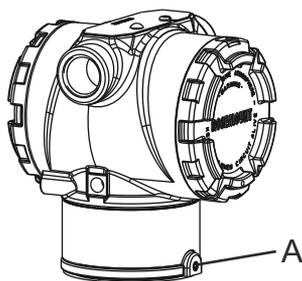
Note

A weep hole has been designed into the transmitter for safety and leak detection. If fluid begins to leak from the weep hole, isolate the process pressure, disconnect the transmitter, and reseal until the leak is resolved.

2.2 Consider housing rotation

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

Figure 2-13: Housing Rotation



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

Procedure

1. Loosen the housing rotation set screw using a 5/64-in. hex wrench.
2. Rotate the housing clockwise to the desired location.
3. If the desired location cannot be achieved due to thread limit, 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-lb when it reaches the desired location.

2.3 Set the switches

Use the following procedure to change the switch configuration:

Set **Simulate** and **Security** switch configuration before installation as shown in [Figure 2-14](#).

- The **Simulate** switch enables or disables simulated alerts and simulated AI Block status and values. The default **Simulate** switch position is Enabled.
- The **Security** switch allows (unlocked symbol) or prevents (locked symbol) any configuration of the transmitter.

- Default **Security** is Off (unlocked symbol).
- You can enable or disable the **Security** switch in the software.

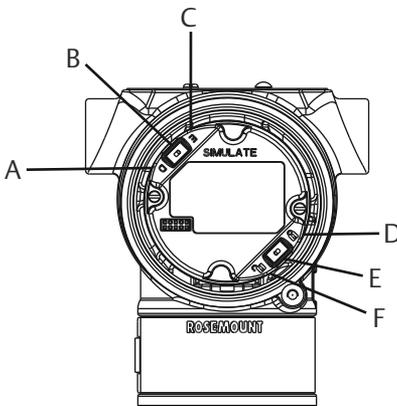
Procedure

1. If the transmitter is installed, secure the loop and remove power.
2. Remove the housing cover opposite the field terminal side. Do not remove the instrument cover in explosive atmospheres when the circuit is live.
3. Slide the **Security** and **Simulate** switches into the preferred position.
4. Replace the housing cover.

Note

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

Figure 2-14: Simulate and Security Switches



- A. *Simulate disabled position*
- B. *Simulate switch*
- C. *Simulate enabled position*
- D. *Security locked position*
- E. *Security switch*
- F. *Security unlocked position*

2.4 Connect wiring and power up

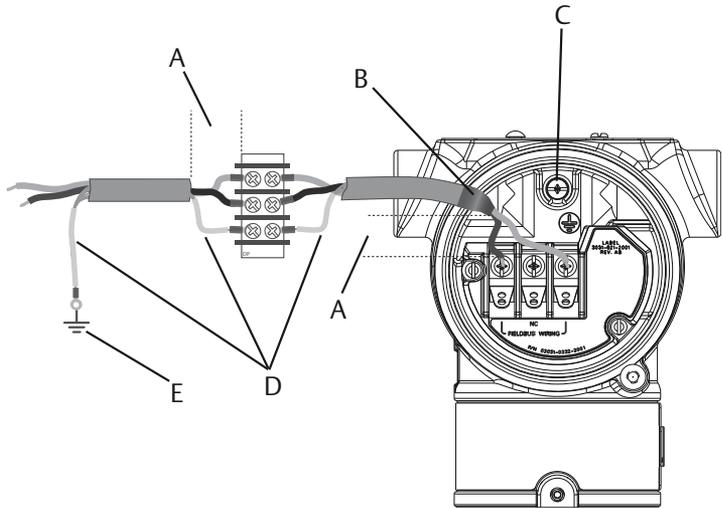
Use copper wire of sufficient size to ensure that the voltage across the transmitter power terminals does not drop below 9 Vdc. Power supply voltage can be variable, especially under abnormal conditions, such as when

operating on battery backup. Emerson recommends a minimum of 12 Vdc under normal operating conditions and shielded twisted pair Type A cable.

Procedure

1. To power the transmitter, connect the power leads to the terminals indicated on the terminal block label.

Figure 2-15: Wiring Terminals



- A. Minimize distance
- B. Trim shield and insulate
- C. Protective grounding terminal (do not ground cable shield at the transmitter)
- D. Insulate shield
- E. Connect shield back to the power supply ground

Note

The Rosemount 3051 power terminals are polarity insensitive, which means the electrical polarity of the power leads does not matter when connecting to the power terminals. If polarity sensitive devices are connected to the segment, follow terminal polarity. When wiring to the screw terminals, Emerson recommends using crimped legs.

2. 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.

Note

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

2.4.1 Ground signal wiring

Do not run signal wiring in conduit or open trays with power wiring or near heavy electrical equipment. Emerson provides grounding terminations on the outside of the electronics housing and inside the terminal compartment. Use these grounds when transient protect terminal blocks are installed or to fulfill local regulations.

Procedure

1. Remove the field terminals housing cover.
2. Connect the wiring pair and ground as indicated in [Figure 2-15](#).
 - a) Trim the cable shield as short as practical and insulate from touching the transmitter housing.

Note

Do not ground the cable shield at the transmitter; if the cable shield touches the transmitter housing, it can create ground loops and interfere with communications.

- b) Continuously connect the cable shields to the power supply ground.
- c) Connect the cable shields for the entire segment to a single good earth ground at the power supply.

Note

Improper grounding is the most frequent cause of poor segment communications.

3. Replace the housing cover. Emerson recommends tightening the cover until there is no gap between the cover and the housing.
4. Plug and seal unused conduit connections.

2.4.2 Power supply

The transmitter requires between 9 and 32 Vdc (9 and 30 Vdc for intrinsic safety and 9 and 17.5 Vdc for FISCO intrinsic safety) to operate and provide complete functionality.

2.4.3 Power conditioner

A Fieldbus segment requires a power conditioner to isolate the power supply filter and decouple the segment from other segments attached to the same power supply.

2.4.4 Grounding

Signal wiring of the Fieldbus segment cannot be grounded. Grounding out one of the signal wires will shut down the entire Fieldbus segment.

2.4.5 Shield wire ground

To protect the Fieldbus segment from noise, grounding techniques for shield wire require a single grounding point for shield wire to avoid creating a ground loop. Connect the cable shields for the entire segment to a single good earth ground at the power supply.

2.4.6 Signal termination

For every Fieldbus segment, install a terminator at the beginning and end of each segment.

2.4.7 Locating devices

Frequently, different personnel install, configure, and commission devices over time. A Locate Device capability uses the LCD display (when installed) to assist personnel in finding the desired device.

From the device Overview screen, select the Locate Device button. This launches a method allowing you to display a Find me message or enter a custom message to display on the device LCD display.

When you exit the Locate Device method, the device LCD display automatically returns to normal operation.

Note

Some hosts do not support Locate Device in the DD.

2.5 Verifying configuration

Verify the configuration using any HART capable configuration tool or LOI option code M4.

This section includes configuration instructions for a Field Communicator and LOI. See Rosemount 3051 [Reference Manual](#) for instruction on configuring with AMS Device Manager.

2.5.1 Verify configuration with a Field Communicator

You must install a Rosemount 3051 DD on the Field Communicator to verify configuration.

[Table 2-2](#) shows Fast Key sequences for the latest DD. For Fast Key sequences using legacy DD's, contact your local Emerson representative.

Note

Emerson recommends installing the latest DD to access the complete functionality. Visit Emerson.com/Field-Communicator for information on updating the DD library.

Verify device configuration using the Fast Key sequences in [Table 2-2](#).

Table 2-2: Device Revision 9 and 10 (HART 7), DD Revision 1 Fast Key Sequence

A check (✓) indicates the basic configuration parameters. At minimum, verify these parameters as part of configuration and startup.

	Function	Fast Key sequence	
		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
	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 (3051S)	3, 3, 3	3, 3, 3

Table 2-2: Device Revision 9 and 10 (HART 7), DD Revision 1 Fast Key Sequence (continued)

	Function	Fast Key sequence	
		HART 7	HART 5
	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

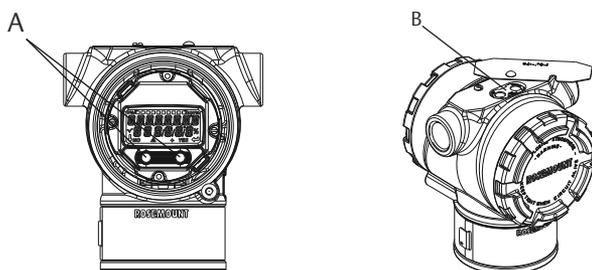
(1) Only available in HART Revision 7 mode.

2.5.2 Verify configuration with LOI

You can use the optional LOI to commission the device. The LOI is a two-button design with internal and external buttons. The internal buttons are located on the display of the transmitter, while the external buttons are located underneath the top metal tag.

To activate the LOI, push any button. The bottom corners of the display show LOI button functionality. See [Table 2-3](#) and [Figure 2-16](#) for button operation and menu information.

Figure 2-16: Internal and External LOI Buttons



A. Internal buttons

B. External buttons

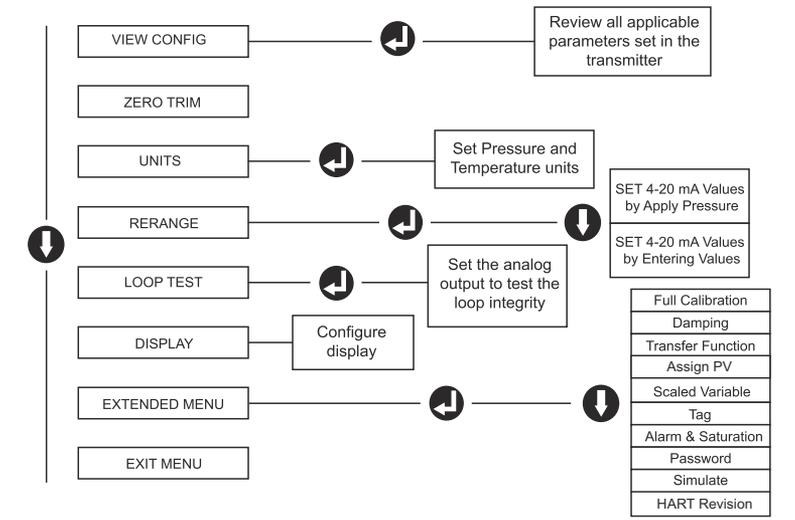
Note

See [Figure 2-18](#) to confirm external button functionality.

Table 2-3: LOI Button Operation

Button		
Left	No	SCROLL
Right	Yes	ENTER

Figure 2-17: LOI Menu



2.5.3 Switch HART revision mode

If the HART configuration tool is not capable of communicating with HART Revision 7, the Rosemount 3051 loads a generic menu with limited capability. To switch the HART revision mode from the generic menu:

Go 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.

Note

See [Table 2-2](#) to change HART revision when the correct device driver is loaded.

2.6 Trim the transmitter

Emerson calibrates the devices at the factory. Once they are installed, Emerson recommends performing a zero trim on gage and differential pressure transmitters to eliminate error due to mounting position or static pressure effects. You can perform a zero trim using either a Field Communicator or configuration buttons.

For instructions on trimming the transmitter with AMS Device Manager, see the Rosemount 3051 HART Revision 5 and 7 [Reference Manual](#).

Note

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

⚠ CAUTION

Emerson does not recommend zeroing an absolute transmitter, Rosemount 3051CA or 3051TA models.

Choose your trim procedure.

1. Analog zero trim: Sets the analog output to 4 mA.
 - Also referred to as *rerange*, it sets the lower range value (LRV) equal to the measured pressure.
 - The display and digital HART output remains unchanged.
2. 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 zero.
 - This requires that the factory calibrated zero pressure is within a range of 3% of the URL ($0 + 3\% \times \text{URL}$).

Example

URV = 250 inH₂O

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

2.6.1 Trim with a Field Communicator

Procedure

1. Connect the Field Communicator.

See [Connect wiring and power up](#) for instructions.

2. Follow the HART menu to perform the desired zero trim.

Table 2-4: Zero Trim Fast Keys

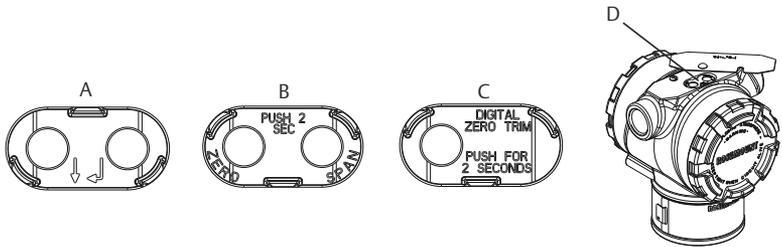
	Analog zero (set 4 mA)	Digital zero
Fast Key Sequence	3, 4, 2	3, 4, 1, 3

2.6.2 Trimming with configuration buttons

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

To access the configuration buttons, loosen the screw and slide the tag on the top of the transmitter. Confirm the functionality using [Figure 2-18](#).

Figure 2-18: External Configuration Buttons



- A. LOI
- B. Analog zero and span
- C. Digital zero
- D. Configuration buttons

Use the following procedures to perform a zero trim:

Trim with LOI (option M4)

Procedure

1. Set the transmitter pressure.
2. See [Figure 2-17](#) for the operating menu.
 - To perform an analog zero trim, select **Rerange**.
 - To perform a digital zero trim, select **Zero Trim**.

Trim with analog Zero and Span (option D4)

Procedure

1. Set the transmitter pressure.
2. Press and hold the **Zero** button for two seconds to perform an analog zero trim.

3 Safety instrumented systems installation

For safety certified installations, refer to the Rosemount 3051 HART Revision 5 and 7 [Reference Manual](#) for installation procedure and system requirements.

4 Product certifications

Rev 2.8

4.1 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.

4.2 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).

4.3 North America

4.3.1 E5 USA Explosionproof (XP) and Dust-Ignitionproof (DIP)

Ranges 1-5 (HART)

Certificate FM16US0121

Standards FM Class 3600 – 2018, FM Class 3615 – 2018, FM Class 3616 - 2011, FM Class 3810 – 2005, ANSI/NEMA 250 – 2008

Markings XP CL I, DIV 1, GP B, C, D; DIP CL II, DIV 1, GP E, F, G; CL III; T5(-50 °C ≤ T_a ≤ +85 °C); Factory Sealed; Type 4X

Range 6 (HART/Fieldbus/PROFIBUS®)

Certificate 1053834

Standards ANSI/ISA 12.27.01-2003, CSA Std. C22.2 No. 30 -M1986, CSA Std. C22.2 No.142-M1987, CSA Std. C22.2 No. 213 - M1987

Markings XP Class I, Division 1, Groups B, C and D, T5, (-50 °C ≤ T_a ≤ 85 °C) Suitable for Class I, Zone 1, Group IIB+H2, T5; DIP Class II and Class III, Division 1, Groups E, F and G, T5, (-50 °C ≤ T_a ≤ 85 °C) ; Type 4X; Factory Sealed; Single Seal (See drawing 03031-1053)

4.3.2 I5 USA Intrinsic Safety (IS) and Nonincendive (NI)

Range 1-5 (HART)

Certificate FM16US0120X

Standards FM Class 3600 - 2011, FM Class 3610 - 2010, FM Class 3611 - 2004, FM Class 3810 - 2005, ANSI/NEMA 250 - 2008

Markings IS CL I, DIV 1, GP A, B, C, D; CL II, DIV 1, GP E, F, G; Class III; DIV 1 when connected per Rosemount drawing 03031-1019; NI CL 1, DIV 2, GP A, B, C, D; T4 ($-50\text{ }^{\circ}\text{C} \leq T_a \leq +70\text{ }^{\circ}\text{C}$) [HART], T4 ($-50\text{ }^{\circ}\text{C} \leq T_a \leq +60\text{ }^{\circ}\text{C}$) [Fieldbus/PROFIBUS]; Type 4X

Special Conditions for Safe Use (X):

1. The Rosemount 3051 Transmitter housing contains aluminum and is considered a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact and friction.
2. The Rosemount 3051 Transmitter with the transient terminal block (Option code T1) will not pass the 500 Vrms dielectric strength test, and this must be taken into account during installation.

Range 1-6 (HART/Fieldbus/PROFIBUS)

Certificate 1053834

Standards ANSI/ISA 12.27.01-2003, CSA Std. C22.2 No.142-M1987, CSA Std. C22.2. No.157-92

Markings IS Class I, II, III, Division 1 Groups A, B, C, D, E, F, and G when connected in accordance with Rosemount drawing 03031-1024, Suitable for Class I, Zone 0 Group IIC; Class I, Division 2, Groups A, B, C, and D; NIFW; Suitable for Class I, Zone 2, Group IIC; HART: T4 ($-60\text{ }^{\circ}\text{C} \leq T_a \leq +70\text{ }^{\circ}\text{C}$), T5 ($-60\text{ }^{\circ}\text{C} \leq T_a \leq +40\text{ }^{\circ}\text{C}$)
Fieldbus/PROFIBUS: T4 ($-60\text{ }^{\circ}\text{C} \leq T_a \leq +60\text{ }^{\circ}\text{C}$)
Type 4X

4.3.3 IE USA FISCO

Range 1-5 (HART)

Certificate FM16US0120X

Standards FM Class 3600 - 2011, FM Class 3610 - 2010, FM Class 3611 - 2004, FM Class 3810 - 2005

Markings IS CL I, DIV 1, GP A, B, C, D when connected per Rosemount drawing 03031-1019 ($-50\text{ }^{\circ}\text{C} \leq T_a \leq +60\text{ }^{\circ}\text{C}$); Type 4X

Special Conditions for Safe Use (X):

1. The Rosemount 3051 Transmitter housing contains aluminum and is considered a potential risk of ignition by impact or friction. Care must

be taken into account during installation and use to prevent impact and friction.

2. The Rosemount 3051 Transmitter with the transient terminal block (Option code T1) will not pass the 500 Vrms dielectric strength test, and this must be taken into account during installation.

Range 1-6 (HART/Fieldbus/PROFIBUS)

Certificate 1053834

Standards ANSI/ISA 12.27.01-2003, CSA Std. C22.2 No.142-M1987, CSA Std. C22.2. No.157-92

Markings IS Class I, Division 1 Groups A, B, C, D, T4 ($-60\text{ }^{\circ}\text{C} \leq T_a \leq +60\text{ }^{\circ}\text{C}$) when connected in accordance with Rosemount drawing 03031-1024, Suitable for Class I, Zone 0 Group IIC; Type 4X; Factory Sealed; Single Seal (See drawing 03031-1053)

4.3.4 C6 Canada Explosionproof, Dust-Ignitionproof, Intrinsic Safety and Nonincendive

Certificate 1053834

Standards ANSI/ISA 12.27.01-2003, CSA Std. C22.2 No. 30 -M1986, CSA Std. C22.2 No.142-M1987, CSA Std. C22.2. No.157-92, CSA Std. C22.2 No. 213 - M1987

Markings Explosionproof for Class I, Division 1, Groups B, C and D; Suitable for Class I, Zone 1, Group IIB+H2, T5 ($-50\text{ }^{\circ}\text{C} \leq T_a \leq +85\text{ }^{\circ}\text{C}$);
Dust-Ignitionproof Class II, III Division 1, Groups E, F, G; T5 ($-50\text{ }^{\circ}\text{C} \leq T_a \leq +85\text{ }^{\circ}\text{C}$);
Intrinsically Safe Class I, Division 1, Groups A, B, C, D when connected in accordance with Rosemount drawing 03031-1024, Temperature Code T4; Suitable for Class I, Zone 0;
Class I Division 2 Groups A, B, C, and D, T5; Suitable for Class I Zone 2, Group IIC; Type 4X; Factory Sealed; Single Seal (See drawing 03031-1053)

4.3.5 E6 Canada Explosionproof, Dust-Ignitionproof and Division 2

Certificate 1053834

Standards ANSI/ISA 12.27.01-2003, CSA Std. C22.2 No. 30 -M1986, CSA Std. C22.2 No.142-M1987, CSA Std. C22.2 No. 213 - M1987

Markings Explosionproof Class I, Division 1, Groups B, C, and D; Suitable for Class I, Zone 1, Group IIB+H2, T5;

Dust-Ignitionproof for Class II and Class III, Division 1, Groups E, F, and G; T5 ($-50\text{ °C} \leq T_a \leq +85\text{ °C}$);
 Class I, Division 2, Groups A, B, C, and D; T5; Suitable for Class I Zone 2, Group IIC; Type 4X; Factory Sealed; Single Seal (See drawing 03031-1053)

4.4 Europe

4.4.1 E8 ATEX Flameproof and Dust

Certificate	KEMA00ATEX2013X; Baseefa11ATEX0275X
Standards Used	EN60079-0:2012 + A11:2013, EN60079-1:2014, EN60079-26:2015, EN60079-31:2009
Markings	<p>⊕ II ½ G Ex db IIC T6...T4 Ga/Gb T6 ($-60\text{ °C} \leq T_a \leq +70\text{ °C}$), T4/T5 ($-60\text{ °C} \leq T_a \leq +80\text{ °C}$);</p> <p>⊕ II 1 D Ex ta IIIC T95 °C T₅₀₀ 105 °C Da ($-20\text{ °C} \leq T_a \leq +85\text{ °C}$)</p>

Table 4-1: Process Temperature

Temperature class	Process connection temperature
T6	-60 °C to $+70\text{ °C}$
T5	-60 °C to $+80\text{ °C}$
T4	-60 °C to $+120\text{ °C}$

Special Conditions for Safe Use (X):

1. This device contains a thin wall diaphragm less than 1 mm thick that forms a boundary between Category 1 (process connection) and Category 2 (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.

- Some variants of the equipment have reduced markings on the nameplate. Refer to the Certificate for full equipment marking.

4.4.2 I1 ATEX Intrinsic Safety and Dust

Certificate BAS97ATEX1089X; Baseefa11ATEX0275X

Standards EN60079-0:2012 + A11:2013, EN60079-11:2012, EN60079-31:2014

Markings HART:  II 1 G Ex ia IIC T5/T4 Ga, T5 (-60 °C ≤ T_a ≤ +40 °C), T4 (-60 °C ≤ T_a ≤ +70 °C)

Fieldbus/PROFIBUS:  II 1 G Ex ia IIC Ga T4 (-60 °C ≤ T_a ≤ +60 °C)

DUST:  II 1 D Ex ta IIIC T95 °C T₅₀₀ 105 °C Da (-20 °C ≤ T_a ≤ +85 °C)

Table 4-2: Input Parameters

Parameter	HART	Fieldbus/PROFIBUS
Voltage U _i	30 V	30 V
Current I _i	200 mA	300 mA
Power P _i	0.9 W	1.3 W
Capacitance C _i	0.012 μF	0 μF
Inductance L _i	0 mH	0 mH

Special Conditions for Safe Use (X):

- The apparatus is not capable of withstanding the 500 V insulation test required by clause 6.3.12 of EN60079-11: 2012. This must be taken into account when installing the apparatus.
- 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 of located in Zone 0.
- Some variants of the equipment have reduced markings on the nameplate. Refer to the Certificate for full equipment marking.

4.4.3 IA ATEX FISCO

Certificate BAS97ATEX1089X

Standards EN60079-0:2012 + A11:2013, EN60079-11:2012

Markings  II 1 G Ex ia IIC T4 Ga (-60 °C ≤ T_a ≤ +60 °C)

Table 4-3: Input Parameters

Parameter	Fieldbus/PROFIBUS
Voltage U_i	17.5 V
Current I_i	380 mA
Power P_i	5.32 W
Capacitance C_i	≤ 5 nF
Inductance L_i	≤ 10 μ H

Special Conditions for Safe Use (X):

1. The apparatus is not capable of withstanding the 500 V insulation test required by clause 6.3.12 of EN60079-11: 2012. This must be taken into account when installing the apparatus.
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 of located in Zone 0.

4.4.4 N1 ATEX Type n and Dust

Certificate BAS00ATEX3105X; Baseefa11ATEX0275X

Standards EN60079-0:2012 + A11:2013, EN60079-15:2010, EN60079-31:2014

Markings  II 3 G Ex nA IIC T5 Gc ($-40\text{ }^{\circ}\text{C} \leq T_a \leq +70\text{ }^{\circ}\text{C}$);
 II 1 D Ex ta IIIC T95 $^{\circ}\text{C}$ T₅₀₀ 105 $^{\circ}\text{C}$ Da ($-20\text{ }^{\circ}\text{C} \leq T_a \leq +85\text{ }^{\circ}\text{C}$)

Special Conditions for Safe Use (X):

1. This apparatus is not capable of withstanding the 500 V insulation test that is required by clause 6.8.1 of EN60079-15. This must be taken into account when installing the apparatus.
2. Some variants of the equipment have reduced markings on the nameplate. Refer to the Certificate for full equipment marking.

4.5 International**4.5.1 E7 IECEx Flameproof and Dust**

Certificate IECEx KEM 09.0034X; IECEx BAS 10.0034X

Standards IEC60079-0:2011, IEC60079-1:2014-06, IEC60079-26:2014-10, IEC60079-31:2013

Markings Ex db IIC T6...T4 Ga/Gb T6($-60\text{ °C} \leq T_a \leq +70\text{ °C}$), T4/T5($-60\text{ °C} \leq T_a \leq +80\text{ °C}$); Ex ta IIIC T95 °C T₅₀₀ 105 °C Da ($-20\text{ °C} \leq T_a \leq +85\text{ °C}$)

Table 4-4: Process Temperature

Temperature class	Process connection temperature
T6	-60 °C to $+70\text{ °C}$
T5	-60 °C to $+80\text{ °C}$
T4	-60 °C to $+120\text{ °C}$

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.
4. Some variants of the equipment have reduced markings on the nameplate. Refer to the Certificate for full equipment marking.

4.5.2 I7 IECEx Intrinsic Safety

Certificate IECEx BAS 09.0076X

Standards IEC60079-0:2011, IEC60079-11:2011

Markings HART: Ex ia IIC T5/T4 Ga, T5($-60\text{ °C} \leq T_a \leq +40\text{ °C}$), T4 ($-60\text{ °C} \leq T_a \leq +70\text{ °C}$)

Fieldbus/PROFIBUS: Ex ia IIC T4($-60\text{ °C} \leq T_a \leq +60\text{ °C}$)

Table 4-5: Input Parameters

Parameter	HART	Fieldbus/PROFIBUS
Voltage U_i	30 V	30 V

Table 4-5: Input Parameters (continued)

Parameter	HART	Fieldbus/PROFIBUS
Current I_i	200 mA	300 mA
Power P_i	0.9 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 apparatus is fitted with an optional 90 V transient suppressor, it is not capable of withstanding the 500 V insulation test required by clause 6.3.12 of IEC 60079-11. This must be taken into account when installing the apparatus.
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 of located in Zone 0.

IECEx Mining (Special A0259)

Certificate	IECEx TSA 14.0001X
Standards	IEC60079-0:2011, IEC60079-11:2011
Markings	Ex ia I Ma ($-60\text{ }^{\circ}\text{C} \leq T_a \leq +70\text{ }^{\circ}\text{C}$)

Table 4-6: Input Parameters

Parameter	HART	Fieldbus/ PROFIBUS	FISCO
Voltage U_i	30 V	30 V	17.5 V
Current I_i	200 mA	300 mA	380 mA
Power P_i	0.9 W	1.3 W	5.32 W
Capacitance C_i	0.012 μ F	0 μ F	<5 nF
Inductance L_i	0 mH	0 mH	<10 μ H

Special Conditions for Safe Use (X):

1. If the apparatus is fitted with an optional 90 V transient suppressor, it is not capable of withstanding the 500 V insulation test required by IEC60079-11. This must be taken into account when installing the apparatus.
2. It is a condition of safe use that the above input parameters shall be taken into account during installation.

- It is a condition of manufacture that only the apparatus fitted with housing, covers, and sensor module housing made out of stainless steel are used in Group 1 applications.

4.5.3 IG IECEx FISCO

Certificate	IECEx BAS 09.0076X
Standards	IEC60079-0:2011, IEC60079-11:2011
Markings	Ex ia IIC T4 Ga (-60 °C ≤ T _a ≤ +60 °C)

Table 4-7: Input Parameters

Parameters	Fieldbus/PROFIBUS
Voltage U _i	17.5 V
Current I _i	380 mA
Power P _i	5.32 W
Capacitance C _i	≤ 5 nF
Inductance L _i	≤ 10 μH

Special Conditions for Safe Use (X):

- If the apparatus is fitted with an optional 90 V transient suppressor, it is not capable of withstanding the 500 V insulation test required by clause 6.3.12 of IEC 60079-11. This must be taken into account when installing the apparatus.
- 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 of located in Zone 0.

4.5.4 N7 IECEx Type n

Certificate	IECEx BAS 09.0077X
Standards	IEC60079-0:2011, IEC60079-15:2010
Markings	Ex nA IIC T5 Gc (-40 °C ≤ T _a ≤ +70 °C)

Special Condition for Safe Use (X):

- This apparatus is not capable of withstanding the 500 V insulation test required by clause 6.5.1 of IEC 60079-15. This must be taken into account when installing the apparatus.

4.6 Brazil

4.6.1 E2 INMETRO Flameproof

Certificate UL-BR 13.0643X

Standards ABNT NBR IEC 60079-0:2013; ABNT NBR IEC 60079-1:2016;
ABNT NBR IEC 60079-26:2016

Markings Ex db IIC T6...T4 Ga/Gb, T6($-60\text{ °C} \leq T_a \leq +70\text{ °C}$), T4/T5 ($-60\text{ °C} \leq T_a \leq +80\text{ °C}$)

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.

4.6.2 I2 INMETRO Intrinsic Safety

Certificate UL-BR 13.0584X

Standards ABNT NBR IEC60079-0:2013, ABNT NBR IEC60079-11:2013

Markings HART: Ex ia IIC T5/T4 Ga, T5($-60\text{ °C} \leq T_a \leq +40\text{ °C}$), T4 ($-60\text{ °C} \leq T_a \leq +70\text{ °C}$)
Fieldbus/PROFIBUS: Ex ia IIC T4 Ga ($-60\text{ °C} \leq T_a \leq +60\text{ °C}$)

Table 4-8: Input Parameters

Parameter	HART	Fieldbus/PROFIBUS
Voltage U_i	30 V	30 V
Current I_i	200 mA	300 mA
Power P_i	0.9 W	1.3 W
Capacitance C_i	0.012 μF	0 μF

Table 4-8: Input Parameters (continued)

Parameter	HART	Fieldbus/PROFIBUS
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 not capable of withstanding the 500 V insulation test required by ABNT NBR IRC 60079-11. This must be taken into account when installing the equipment.
2. The enclosure may be made of aluminum alloy and given protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if equipment requires EPL Ga.

4.6.3 IB INMETRO FISCO

Certificate UL-BR 13.0584X**Standards** ABNT NBR IEC60079-0:2013, ABNT NBR IEC60079-11:2013**Markings** Ex ia IIC T4 Ga (-60 °C ≤ T_a ≤ +60 °C)**Table 4-9: Input Parameters**

Parameter	FISCO
Voltage U_i	17.5 V
Current I_i	380 mA
Power P_i	5.32 W
Capacitance C_i	≤5 nF
Inductance L_i	≤10 μH

Special Conditions for Safe Use (X):

1. If the equipment is fitted with an optional 90 V transient suppressor, it is not capable of withstanding the 500 V insulation test required by ABNT NBR IEC 60079-11. This must be taken into account when installing the equipment.
2. The enclosure may be made of aluminum alloy and given protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if equipment requires EPL Ga.

4.7 China

4.7.1 E3 China Flameproof

Certificate GYJ19.1056X [Transmitters]; GYJ15.1368X [Flow meters]

Standards GB3836.1-2010, GB3836.2-2010, GB3836.20-2010, GB12476.1-2013, GB12476.5-2013

Markings 3051 Series: Ex d IIC T6 ~ T4 Ga/Gb, Ex tD A20 IP66 T95 °C T₅₀₀ 105 °C (-20 °C ≤ Ta ≤ +85 °C)
3051CF Series: Ex d IIC T5/T6 Ga/Gb

一、产品安全使用特殊条件

证书编号后缀“X”表明产品具有安全使用特殊条件：涉及隔爆接合面的维修须联系产品制造商。

1. 涉及隔爆接合面的维修须联系产品制造商。
2. 产品使用厚度小于 1mm 的隔膜作为 0 区（过程连接）和 1 区（产品其他部分）的隔离，安装和维护时需严格遵守制造商提供的说明书，以确保安全性。
3. 产品外部涂层可能产生静电危险，使用时须防止产生静电火花，只能用湿布清理。

二、产品使用注意事项

1. 用于爆炸性气体环境中，产品温度组别和使用环境温度之间的关系为：（变送器）

温度组别	环境温度	过程温度
T6	-60 °C ~ +70 °C	-60 °C ~ +70 °C
T5	-60 °C ~ +80 °C	-60 °C ~ +80 °C
T4	-60 °C ~ +80 °C	-60 °C ~ +120 °C

用于爆炸性气体环境中，产品温度组别和使用环境温度之间的关系为：（流量计）

温度组别	使用环境温度
T6	-50 °C ~ +65 °C
T5	-50 °C ~ +80 °C

2. 产品外壳设有接地端子，用户在使用时应可靠接地； $-20\text{ °C} \leq T_a \leq +85\text{ °C}$
3. 产品外壳设有接地端子，用户在使用时应可靠接地

4. 安装现场应不存在对产品外壳有腐蚀作用的有害气体。
5. 现场安装时，电缆引入口须选用国家指定的防爆检验机构按检验认可、具有 Ex dIIC, Ex tD A20 IP66 防爆等级的电缆引入装置或堵封件，冗余电缆引入口须用堵封件有效密封。
6. 用于爆炸性气体环境中，现场安装、使用和维护必须严格遵守“断电后开盖！”的警告语。用于爆炸性粉尘环境中，现场安装、使用和维护必须严格遵守“爆炸性粉尘场所严禁开盖！”的警告语。
7. 用于爆炸性粉尘环境中，产品外壳表面需保持清洁，以防粉尘堆积，但严禁用压缩空气吹扫。
8. 用户不得自行更换该产品的零部件，应会同产品制造商共同解决运行中出现的故障，以杜绝损坏现象的发生。
9. 产品的安装、使用和维护应同时遵守产品使用说明书、GB3836.13-2013“爆炸性环境 第 13 部分：设备的修理、检修、修复和改造”、GB/T3836.15-2017“爆炸性环境 第 15 部分：电气装置的设计、选型和安装”、GB/T3836.16-2017“爆炸性环境 第 16 部分：电气装置的检查与维护”、GB50257-2014“电气装置安装工程爆炸和火灾危险环境电力装置施工及验收规范”和 GB15577-2007“粉尘防爆安全规程” GB12476.2-2010“可燃性粉尘环境用电气设备 第 1 部分：用外壳和限制表面温度保护的电气设备 第 2 节 电气设备的选择、安装和维护”的有关规定。

4.7.2 I3 China Intrinsic Safety

Certificate GYJ13.1362X; GYJ15.1367X [Flow meters]

Standards GB3836.1-2010, GB3836.4-2010, GB3836.20-2010, GB12476.1-2000

Markings 3051 Series: Ex ia IIC T4/T5 Ga, DIP A20 T_A 80 °C IP66
3051 CF Series: Ex ia IIC T4/T5 Ga

- 产品安全使用特殊条件:
证书编号后缀“X”表明产品具有安全使用特殊条件：
 1. 产品（选用铝合金外壳）外壳含有轻金属，用于 0 区时需注意防止由于冲击或摩擦产生的点燃危险。
 2. 当选择 T1 瞬态抑制端子时,此设备不能承受 GB3836.4-2010 标准中第 6.3.12 条规定的 500V 交流有效值试验电压的介电强度试验。
 3. Transmitter output 为 X 时，需使用由厂家提供的型号为 701PC 的 Smart Power Green Power Module 电池。
 4. 产品外壳含有非金属部件，使用时须防止产生静电火花，只能用湿布清理。
- 产品使用注意事项:

1. 产品使用环境温度范围：

气体/粉尘	Transmitter output	温度组别	环境温度范围
气体	A, M	T5	-60 °C ~ +40 °C
气体	A, M	T4	-60 °C ~ +70 °C
气体	F, W	T4	-60 °C ~ +60 °C
气体	X	T4	-40 °C ~ +70 °C
粉尘	A, F, W	T80 °C	-20 °C ~ +40 °C

2. 本安电气参数：

Transmitter output	最高输入电压 U_i (V)	最大输入电流 I_i (mA)	最大输入功率 P_i (W)	最大内部等效参数	
				C_i (nF)	L_i (μ H)
A, M	30	200	0.9	12	0
F, W	30	300	1.3	0	0
F, W (FISCO)	17.5	380	5.32	5	10

注：Transmitter Output 为 F、W (FISCO) 时，本安电气参数符合 GB3836.19-2010 对 FISCO 现场仪表的参数要求。

- 该产品必须与已通过防爆认证的关联设备配套共同组成本安防爆系统方可使用于爆炸性气体环境。其系统接线必须同时遵守本产品 and 所配关联设备的使用说明书要求，接线端子不得接错。
- 该产品与关联设备的连接电缆应为带绝缘护套的屏蔽电缆，其屏蔽层应在安全场所接地。
- 对于爆炸性粉尘环境，最大输入电压为：

Transmitter output	最高输入电压
A	55 V
F, W	40 V

- 安装现场应不存在对产品外壳有腐蚀作用的有害气体。
- 现场安装时，电缆引入口须选用国家指定的防爆检验机构按检验认可、具有 DIP A20 IP66 防爆等级的电缆引入装置、转接头或堵封件，冗余电缆引入口须用堵封件有效密封。

8. 对于爆炸性粉尘环境，现场安装、使用和维护必须严格遵守“爆炸性粉尘场所严禁开盖！”的警告语。
9. 用户不得自行更换该产品的零部件，应会同产品制造商共同解决运行中出现的故障，以杜绝损坏现象的发生。
10. 安装现场确认无可燃性粉尘存在时方可维修。
11. 产品的安装、使用和维护应同时遵守产品使用说明书、GB3836.13-2013“爆炸性环境 第 13 部分：设备的修理、检修、修复和改造”、GB3836.15-2000“爆炸性气体环境用电气设备 第 15 部分：危险场所电气安装（煤矿除外）”、GB3836.16-2006“爆炸性气体环境用电气设备 第 16 部分：电气装置的检查和维修（煤矿除外）”、GB3836.18-2010“爆炸性环境 第 18 部分：本质安全系统”和 GB50257-2014“电气装置安装工程爆炸和火灾危险环境电力装置施工及验收规范”，GB50527-1996“电气装置安装工程爆炸和火灾危险环境电气装置施工验收规范”以及 GB15577-2007“粉尘防爆安全规程”、GB12476.2-2006“可燃性粉尘环境用电气设备 第 1 部分：用外壳和限制表面温度保护的电气设备 第 2 节：电气设备的选择、安装和维护”的有关规定。

4.7.3 N3 China Type n

Certificate GYJ15.1105X

Standards GB3836.1-2010, GB3836.8-2003

Markings Ex nA nL IIC T5 Gc (-40 °C ≤ T_a ≤ +70 °C)

- 产品安全使用特殊条件
产品防爆合格证号后缀“X”代表产品安全使用有特殊条件：产品不能承受 GB3836.8-2003 标准第 8.1 条中规定的 500V 对地电压试验 1 分钟，安装时需考虑在内。
- 产品使用注意事项
 1. 产品使用环境温度范围为：-40 °C ≤ T_a ≤ 70 °C
 2. 最高输入电压：

Transmitter output	最高输入电压
A, M (3051 Enhanced & 3051 Low Power HART)	55 Vdc
F, W	40 Vdc

3. 现场安装时，电缆引入口须选用经国家指定的防爆检验机构检验认可的、具有 Ex e 或 Ex n 型的电缆引入装置或堵封件，冗余电缆引入口须用堵封件有效密封。

4. 安装现场确认无可燃性气体存在时方可维修。
5. 用户不得自行更换该产品的零部件，应会同产品制造商共同解决运行中出现的故障，以杜绝损坏现象的发生。
6. 产品的安装、使用和维护应同时遵守产品使用说明书、GB3836.13-2013“爆炸性环境 第 13 部分：设备的修理、检修、修复和改造”、GB3836.15-2000“爆炸性气体环境用电气设备 第 15 部分：危险场所电气安装（煤矿除外）”、GB3836.16-2006“爆炸性气体环境用电气设备 第 16 部分：电气装置的检查和维护（煤矿除外）”、GB50257-1996“电气装置安装工程爆炸和火灾危险环境电力装置施工及验收规范”的有关规定。

4.8 Japan

4.8.1 E4 Japan Flameproof

Certificate TC20577, TC20578, TC20583, TC20584 [HART]; TC20579, TC20580, TC20581, TC20582 [Fieldbus]

Markings Ex d IIC T5

4.9 Republic of Korea

4.9.1 EP Republic of Korea Flameproof

Certificate 11-KB4BO-0188X [Mfg Singapore]

Markings Ex d IIC T6...T4

4.9.2 IP Republic of Korea Intrinsic Safety

Certificate 13-KB4BO-0203X [HART – Mfg USA], 13-KB4BO-0204X [Fieldbus – Mfg USA], 10-KB4BO-0138X [HART – Mfg Singapore], 13-KB4BO-0206X [Fieldbus – Mfg Singapore]

Markings Ex ia IIC T5/T4 (HART); Ex ia IIC T4 (Fieldbus)

4.10 Technical Regulations Customs Union (EAC)

4.10.1 EM EAC Flameproof

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.

4.10.2 IM EAC Intrinsically Safe

Markings HART: 0Ex ia IIC T4/T5 Ga X, T4(-60 °C ≤ Ta ≤ +70 °C), T5(-60 °C ≤ Ta ≤ +40 °C)
 Fieldbus/PROFIBUS: 0Ex ia IIC T4 Ga X (-60 °C ≤ Ta ≤ +60 °C)

Special Conditions for Safe Use (X)

See certificate for special conditions.

4.11 Combinations

- K2** Combination of E2 and I2
- K5** Combination of E5 and I5
- K6** Combination of C6, E8, and I1
- K7** Combination of E7, I7, and N7
- K8** Combination of E8, I1, and N1
- KB** Combination of E5, I5, and C6
- KD** Combination of E8, I1, E5, I5, and C6
- KM** Combination of EM and IM
- KP** Combination of EP and IP

4.12 Conduit plugs and adapters

4.12.1 IECEx Flameproof and Increased Safety

Certificate IECEx FMG 13.0032X
Standards IEC60079-0:2011, IEC60079-1:2007, IEC60079-7:2006-2007
Markings Ex de IIC Gb

4.12.2 ATEX Flameproof and Increased Safety

Certificate FM13ATEX0076X
Standards EN60079-0:2012, EN60079-1:2007, IEC60079-7:2007
Markings  II 2 G Ex de IIC Gb

Table 4-10: Conduit Plug Thread Sizes

Thread	Identification mark
M20 × 1.5	M20
½ -14 NPT	½ NPT

Table 4-11: Thread Adapter Thread Sizes

Male thread	Identification mark
M20 × 1.5 – 6H	M20
½–14 NPT	½ –14 NPT
¾ –14 NPT	¾ –14 NPT
Female thread	Identification mark
M20 × 1.5 – 6H	M20
½–14 NPT	½–14 NPT
G½	G½

Special Conditions for Safe Use (X):

1. When the thread adapter or blanking plug is used with an enclosure in type of protection increased safety “e,” the entry thread shall be suitably sealed in order to maintain the ingress protection rating (IP) of the enclosure.
2. The blanking plug shall not be used with an adapter.
3. Blanking plug and threaded adapter shall be either NPT or metric thread forms. G½ thread forms are only acceptable for existing (legacy) equipment installations.

4.13 Additional certifications

4.13.1 SBS American Bureau of Shipping (ABS) Type Approval

Certificate 18-HS1814795-PDA**Intended use** Marine & Offshore Applications – Measurement of either gauge or absolute pressure for liquid, gas and vapor.

4.13.2 SBV Bureau Veritas (BV) Type Approval

Certificate 23155**Requirements** Bureau Veritas rules for the classification of steel ships**Application** Class notations: AUT-UMS, AUT-CCS, AUT-PORT and AUT-IMS; Pressure transmitter type 3051 cannot be installed on diesel engines

4.13.3 SDN Det Norske Veritas (DNV) Type Approval

Certificate TAA000004F

Intended Use DNV GL rules for classification - ships and offshore units

Application **Table 4-12: Location Classes**

Temperature	D
Humidity	B
Vibration	A
EMC	B
Enclosure	D

4.13.4 SLL Lloyds Register (LR) Type Approval

Certificate 11/60002

Application Environmental categories ENV1, ENV2, ENV3, and ENV5

4.13.5 C5 Custody Transfer - Measurement Canada Accuracy Approval

Certificate AG-0226; AG-0454; AG-0477

4.14 EU Declaration of Conformity

	
<h2 style="margin: 0;">EU Declaration of Conformity</h2> <p style="margin: 0;">No: RMD 1017 Rev. AD</p>	
<p>We,</p> <p style="margin-left: 40px;">Rosemount, Inc. 8200 Market Boulevard Chanhassen, MN 55317-9685 USA</p> <p>declare under our sole responsibility that the product,</p> <p style="margin-left: 40px;">Rosemount 3051 Pressure Transmitters</p> <p>manufactured by,</p> <p style="margin-left: 40px;">Rosemount, Inc. 8200 Market Boulevard Chanhassen, MN 55317-9685 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 style="border: 0; border-top: 1px solid black;"/> <p style="font-size: small;">(signature)</p>	<p>Vice President of Global Quality (function)</p> <hr style="border: 0; border-top: 1px solid black;"/>
<p>Chris LaPoint (name)</p>	<p>20-Dec-19; Shakopee, MN USA (date of issue & place)</p>
<p style="font-size: x-small;">Page 1 of 4</p>	



EU Declaration of Conformity

No: RMD 1017 Rev. AD

EMC Directive (2014/30/EU)
Harmonized Standards: EN 61326-1:2013, EN 61326-2-3:2013

PED Directive (2014/68/EU)

Rosemount 3051CA4; 3051CD2, 3, 4, 5; 3051HD2, 3, 4, 5; (also with P9 option)
QS Certificate of Assessment - Certificate No. 12698-2018-CE-USA-ACCREDIA
Module H Conformity Assessment
Other Standards Used: ANSI/ISA61010-1:2004
Note – previous PED Certificate No. 59552-2009-CE-HOU-DNY

All other Rosemount 3051 Pressure Transmitters
Sound Engineering Practice

Transmitter Attachments: Diaphragm Seal, Process Flange, or Manifold
Sound Engineering Practice

Rosemount 3051CFx DP Flowmeters
See DSI 1000 Declaration of Conformity

RoHS Directive (2011/65/EU)

Models 3051 Pressure Transmitters
Harmonized standard: EN 50581:2012

Does not apply to the following options:

- Wireless output code X
- Low power output code M

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EU Declaration of Conformity

No: RMD 1017 Rev. AD

ATEX Directive (2014/34/EU)

BAS97ATEX1089X - Intrinsic Safety

Equipment Group II Category 1 G

Ex ia IIC T5/T4 Ga

Harmonized Standards Used:

EN60079-0:2012 + A11:2013, EN60079-11:2012

BAS00ATEX3105X - Typen

Equipment Group II Category 3 G

Ex nA IIC T5 Gc

Harmonized Standards Used:

EN60079-0:2012 + A11:2013, EN60079-15:2010

BaseefallATEX0275X - Dust

Equipment Group II Category 1 D

Ex ta IIIC T95°C T50/105°C Da

Harmonized Standards Used:

EN60079-0:2012 + A11:2013, EN60079-31:2014

KEMA00ATEX2013X - Flameproof

Equipment Group II Category 1/2 G

Ex db IIC T6...T4 Ga/Gb

Harmonized Standards Used:

EN60079-0:2012 + A11:2013, EN60079-1:2014, EN60079-26:2015



EU Declaration of Conformity

No: RMD 1017 Rev. AD

PED Notified Body

DNV GL Business Assurance Italia S.r.l. [Notified Body Number: 0496]
Via Energy Park, 14, N-20871
Vimercate (MB), Italy

*Note – equipment manufactured prior to 20 October 2018 may be marked with the previous PED Notified Body number, previous PED Notified Body information was as follows:
Det Norske Veritas (DNV) [Notified Body Number: 0575]
Veritasveien 1, N-1522
Hovik, Norway*

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 FIMCO OY [Notified Body Number: 0598]
P.O. Box 30 (Särkiniementie 3)
00211 HELSINKI
Finland

ATEX Notified Body for Quality Assurance

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00211 HELSINKI
Finland

4.15 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 Rosemount 3051
List of Rosemount 3051 Parts with China RoHS Concentration above MCVs

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



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