Quick Start Guide
00825-0100-4007, Rev DD
January 2017

Rosemount™ 3051 Pressure Transmitter and Rosemount 3051CF Series Flowmeters

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



Note

Before installing the transmitter, confirm the correct device driver is loaded on the host systems. See page 3 for 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 the Rosemount 3051 HART Revision 5 and 7 Reference Manual for more instruction. This manual is also available electronically on Emerson.com/Rosemount.

⚠ 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 the Rosemount 3051 Reference Manual for any restrictions associated with a safe installation.

- Before connecting a HART-based communicator in an explosive atmosphere, make sure the instruments in the loop 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 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 can result in death or serious injury.

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

Conduit/cable entries

- Unless marked, the conduit/cable entries in the transmitter housing use a $^{1}/_{2}$–14 NPT thread form.
- Entries marked “M20” are M20 × 1.5 thread form. On devices with multiple conduit entries, all entries will have the same thread form.
- Only use plugs, adapters, glands, or conduit with a compatible thread form when closing these entries.

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1.0 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 page 13.

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 device driver at Emerson.com or Hartcomm.org.

Rosemount 3051 device revisions and drivers

Table 1 provides the information necessary to ensure you have the correct device driver and documentation for your device.

Table 1. Rosemount 3051 Device Revisions and Files

	Identify device		Find device driver		Review instructions	Review functionality
Software release date	**NAMUR software revision(1)**	**HART software revision(2)**	**HART universal revision**	**Device revision(3)**	**Manual document number**	**Changes to software(4)**
Dec-11	1.0.0	01	7	10	00809-0100-4007	See Footnote 4 for list of changes.
			5	9		
Jan-98	N/A	178	5	3	00809-0100-4001	N/A

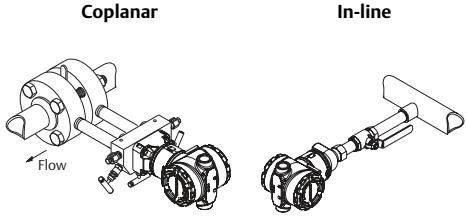
1. NAMUR software revision is located on the hardware tag of the device. In accordance with NE53, revisions of the least significant level X (of 1.0.X) do not change functionality or operation of the device and will not be reflected in this device revision history.
2. HART software revision can be read using a HART capable configuration tool.
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, the new device driver must be downloaded. It is recommended to download new device driver files to ensure full functionality.
4. HART Revision 5 and 7 Selectable, Power Diagnostics, Safety Certified, Local Operator Interface (LOI), Process Alerts, Scaled Variable, Configurable Alarms, Expanded Engineering Units.

2.0 Transmitter installation

2.1 Mount the transmitter

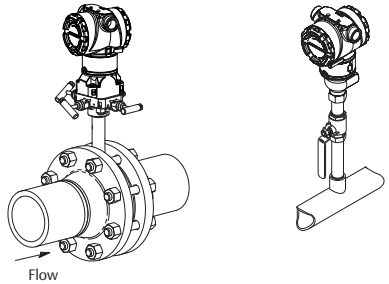
Liquid applications

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



Gas applications

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



Steam applications

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

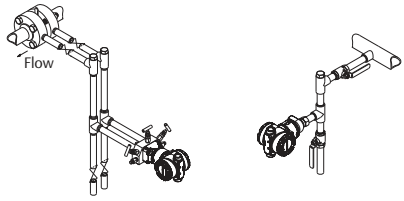
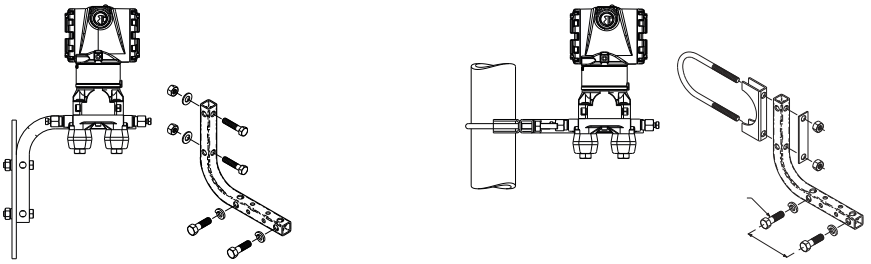


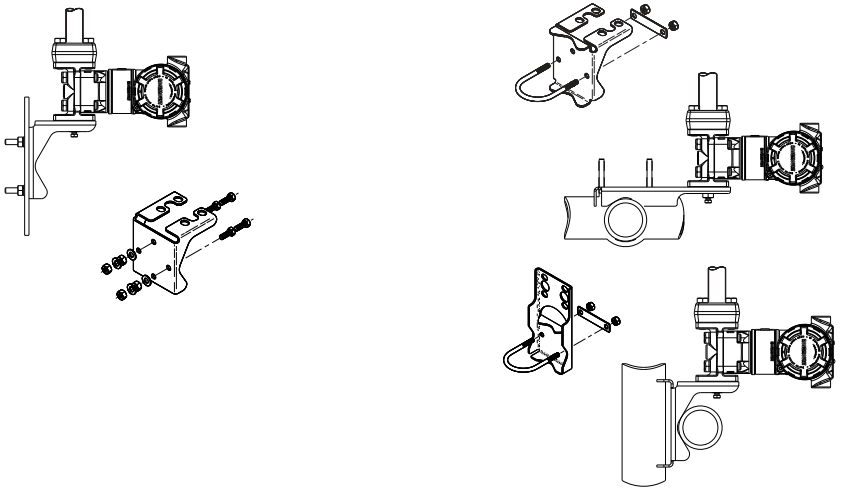
Figure 1. Panel and Pipe Mounting

Panel mount[1] **Pipe mount**

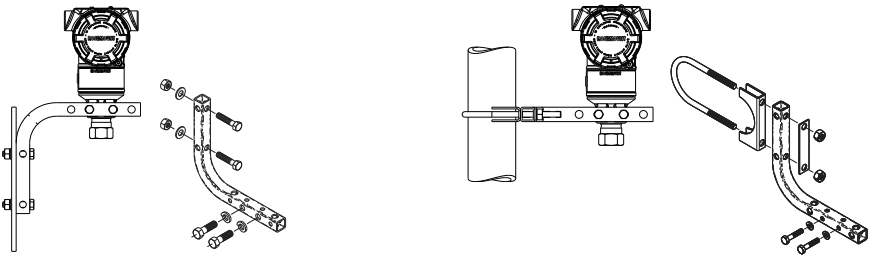
Coplanar flange



Traditional flange



Rosemount 3051T

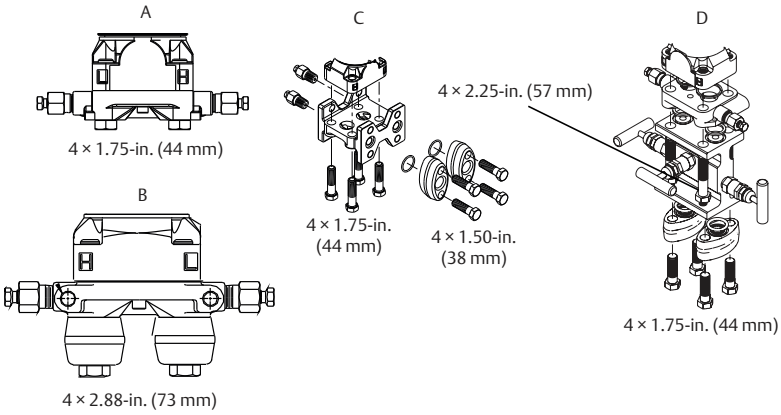


1. $^{5}/_{16} \times 1^{1}/_{2}$ panel bolts are customer supplied.

Bolting considerations

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 on page 6 illustrates common transmitter assemblies with the bolt length required for proper transmitter assembly.

Figure 2. Common Transmitter Assemblies



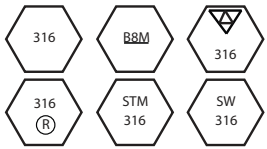
A. Transmitter with coplanar flange
B. Transmitter with coplanar flange and optional flange adapters
C. Transmitter with traditional flange and optional flange adapters
D. Transmitter with coplanar flange and optional manifold and flange adapters

Bolts are typically carbon steel or stainless steel. Confirm the material by viewing the markings on the head of the bolt and referencing Table 2 on page 7. If bolt material is not shown in Table 2, contact a local Emerson representative for more information.

Use the following bolt installation procedure:

1. Carbon steel bolts do not require lubrication and the stainless steel bolts are coated with a lubricant to ease installation. However, no additional lubricant should be applied when installing either type of bolt.
2. Finger-tighten the bolts.
3. Torque the bolts to the initial torque value using a crossing pattern. See Table 2 for initial torque value.
4. Torque the bolts to the final torque value using the same crossing pattern. See Table 2 for final torque value.
5. Verify the flange bolts are protruding through the isolator plate before applying pressure.

Table 2. 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

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.

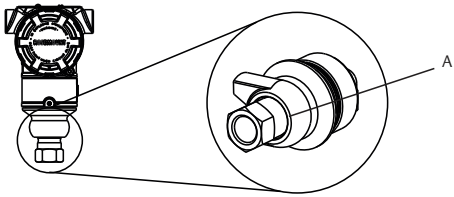
For M20 threads, install conduit plugs to full thread engagement or until mechanical resistance is met.

In-line gage transmitter orientation

The low side pressure port (atmospheric reference) on the in-line gage 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 3.)

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

Figure 3. In-line Gage Low Side Pressure Port



A. Low side pressure port (atmospheric reference)

Installing high pressure coned and threaded connection

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

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 applied to the tube cone to help prevent galling and facilitate sealing. Insert the tubing into the connection and tighten finger tight.
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

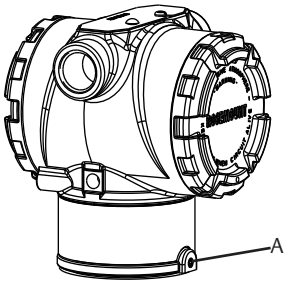
To improve field access to wiring or to better view the optional LCD display:

1. Loosen the housing rotation set screw using a 5/64-in. hex wrench.
2. Turn the housing left or right maximum up to 180° from its original position.(1)

Note
Over rotating can damage the transmitter.

3. Re-tighten the housing rotation set screw to no more than 7 in-lb when desired location is reached.

Figure 4. Transmitter Housing Set Screw



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

2.3 Set the switches

Set alarm and security switch configuration before installation as shown in Figure 5.

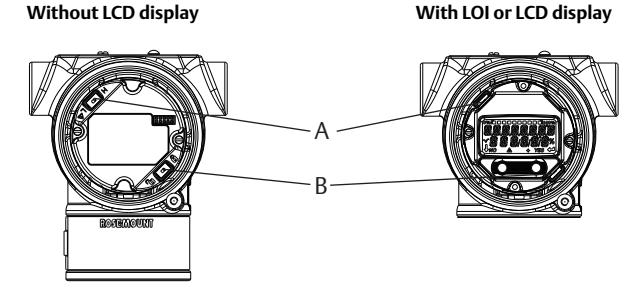
- The alarm switch sets the analog output alarm to high or low.
  - Default alarm is high.
- The security switch allows (unlocked symbol) or prevents (locked symbol) any configuration of the transmitter.
  - Default security is off (unlocked symbol).

1. *Rosemount 3051C original position aligns with "H" side; Rosemount 3051T original position is the opposite side of bracket holes.*

Use the following procedure to change the switch configuration:

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 alarm switches into the preferred position using a small screwdriver.
4. Reattach the transmitter cover. The cover must be fully engaged to comply with explosion-proof requirements.

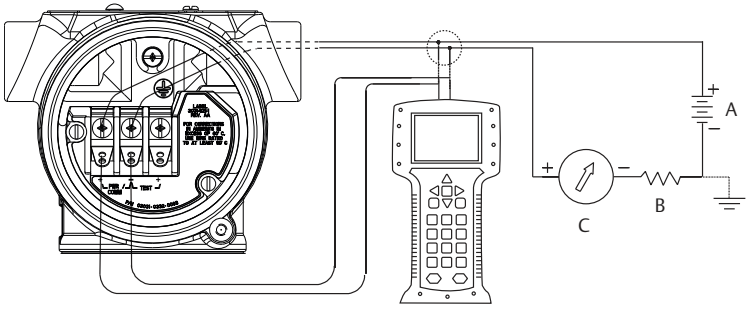
Figure 5. Transmitter Electronics Board



A. Alarm
B. Security

2.4 Connect the wiring and power up

Figure 6. Transmitter Wiring Diagrams (4–20 mA)



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

Shielded twisted pair cable should be used for best results. Use 24 AWG or larger wire that does not exceed 5,000 feet (1500 meters) 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.

⚠ CAUTION

- Installation of the transient protection terminal block does not provide transient protection unless the Rosemount 3051 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.

Use the following steps to wire the transmitter:

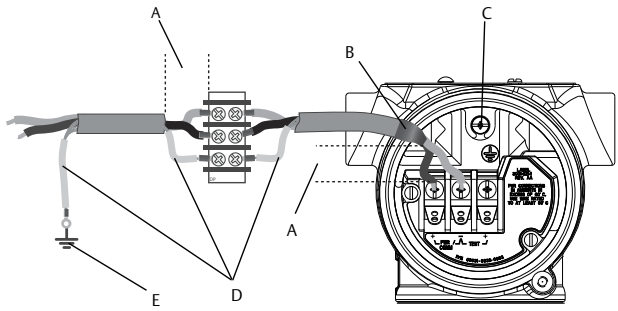
1. Remove the housing cover on the FIELD TERMINALS side.
2. Connect the positive lead to the "+" terminal (PWR/COMM) and the negative lead to the "–" terminal.
3. Tighten the terminal screws to ensure full contact with the terminal block screw and washer. When using a direct wiring method, wrap wire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

Note

The use of a pin or ferrule wire terminal is not recommended 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 that the instrument cable shield be:
   a. Trimmed close and insulated from touching the transmitter housing
   b. Connected to the next shield if cable is routed through a junction box
   c. Connected to a good earth ground at the power supply end
6. If transient protection is needed, refer to section "Grounding for transient terminal block" on page 11 for grounding instructions.
7. Plug and seal unused conduit connections.
8. Replace the housing cover.

Figure 7. 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

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. It is recommended that 18 AWG or larger wire is used to connect housing ground to earth ground (internal or external).

If the transmitter is currently not wired for power up and communication, follow Connect the wiring and power up , step 1 through 8. When the transmitter is properly wired, refer to Figure 7 for internal and external transient grounding locations.

2.5 Verify configuration

Verify the configuration using any HART capable configuration tool or LOI - option code M4. Configuration instructions for a Field Communicator and LOI are included in this step. See Rosemount 3051 Reference Manual for configuration instructions using AMS™ Device Manager.

Verifying configuration with a Field Communicator

A Rosemount 3051 DD must be installed on the Field Communicator to verify configuration. Fast Key sequences for the latest DD are shown in Table 3 on page 11. For Fast Key sequences using legacy DD's, contact your local Emerson Process Management 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.

1. Verify device configuration using the fast key sequences in Table 3.
   a. A check (✓) indicates the basic configuration parameters. At minimum, these parameters should be verified as part of configuration and startup.

Table 3. Device Revision 9 and 10 (HART 7), DD Revision 1 Fast Key Sequence

	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

Table 3. Device Revision 9 and 10 (HART 7), DD Revision 1 Fast Key Sequence

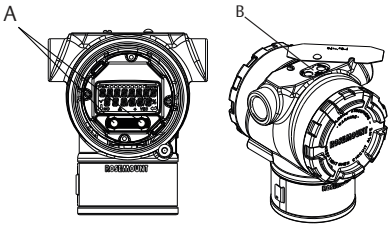
Function	Fast Key sequence	
	HART 7	HART 5
Descriptor	2, 2, 7, 1, 5	2, 2, 7, 1, 4
Digital to Analog Trim (4–20 mA Output)	3, 4, 2	3, 4, 2
Disable Configuration Buttons	2, 2, 6, 3	2, 2, 6, 3
Rerange with Keypad	2, 2, 2, 1	2, 2, 2, 1
Loop Test	3, 5, 1	3, 5, 1
Lower Sensor Trim	3, 4, 1, 2	3, 4, 1, 2
Message	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 (3051S)	3, 3, 3	3, 3, 3
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.

Verifying configuration with LOI

The optional LOI can be used for commissioning 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. LOI button functionality is shown on the bottom corners of the display. See Table 4 and Figure 9 for button operation and menu information.

Figure 8. Internal and External LOI Buttons



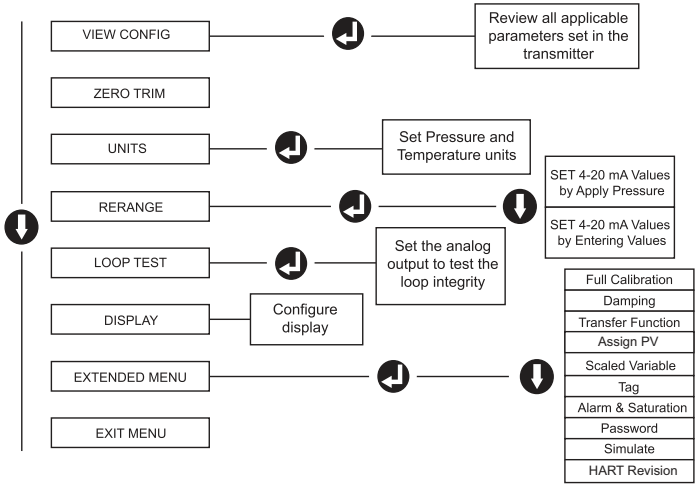
A. Internal buttons
B. External buttons

Note
See Figure 10 on page 15 to confirm external button functionality.

Table 4. LOI Button Operation

Button	EXIT MENU? NO YES	EXIT MENU
Left	No	SCROLL
Right	Yes	ENTER

Figure 9. LOI Menu



Switch HART revision mode

If the HART configuration tool is not capable of communicating with HART Revision 7, the Rosemount 3051 will load a generic menu with limited capability. The following procedures will switch the HART revision mode from the generic menu:

1. *Manual Setup* > *Device Information* > *Identification* > *Message*

a. To change to HART Revision 5, Enter: **HART5** in the Message field.
b. To change to HART Revision 7, Enter: **HART7** in the Message field.

Note
See Table 3 on page 11 to change HART Revision when the correct device driver is loaded.

2.6 Trim the transmitter

Devices are calibrated by the factory. Once installed, it is recommended to perform a zero trim on gage and differential pressure transmitters to eliminate error due to mounting position or static pressure effects. A zero trim can be performed using either a Field Communicator or configuration buttons.

For instructions using 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

It is not recommended to zero an absolute transmitter, Rosemount 3051CA or 3051TA models.

1. Choose your trim procedure.
   a. 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.
   b. 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 3% of the URL [0 + 3% × URL].

Example

URV = 250 inH_2O
Applied Zero Pressure = + 0.03 × 250 inH_2O = + 7.5 inH_2O (compared to factory settings) values outside this range will be rejected by the transmitter.

Trimming with a Field Communicator

1. Connect the Field Communicator, see "Connect the wiring and power up" on page 9 for instructions.
2. Follow the HART menu to perform the desired zero trim.

Table 5. Zero Trim Fast Keys

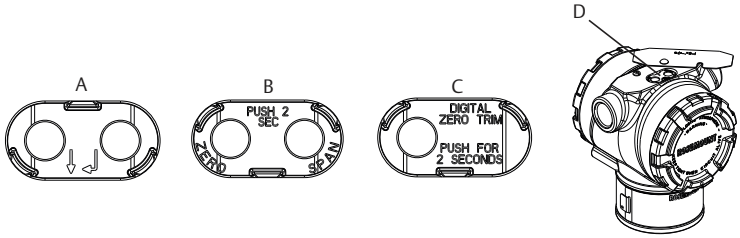
	Analog zero (set 4 mA)	Digital zero
Fast Key Sequence	3, 4, 2	3, 4, 1, 3

Trimming with configuration buttons

A zero trim is to be performed 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 10.

Figure 10. 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:

Perform trim with LOI (option M4)

1. Set the transmitter pressure.
2. See Figure 9 on page 13 for the operating menu.
   a. Perform an analog zero trim by selecting Rerange.
   b. Perform a digital zero trim by selecting Zero Trim.

Perform trim with analog zero and span (option D4)

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

Perform trim with digital zero (option DZ)

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

3.0 Safety instrumented systems installation

For safety certified installations, refer to Rosemount 3051 HART Revision 5 and 7 Reference Manual for installation procedure and system requirements.

4.0 Product certifications

Rev 1.6

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).

North America

E5 USA Explosionproof (XP) and Dust-Ignitionproof (DIP)
Certificate: 0T2H0.AE
Standards: FM Class 3600 – 2011, FM Class 3615 – 2006, FM Class 3810 – 2005, ANSI/NEMA 250 – 2003
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

I5 USA Intrinsic Safety (IS) and Nonincendive (NI)
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 °C ≤ T_a ≤ +70 °C) [HART], T5(–50 °C ≤ T_a ≤ +40 °C) [HART]; T4(–50 °C ≤ T_a ≤ +60 °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.

IE USA FISCO
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 °C ≤ T_a ≤ +60 °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.

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; Dust-Ignitionproof Class II, Division 1, Groups E, F, G; Class III Division 1; Intrinsically Safe Class I, Division 1 Groups A, B, C, D when connected in accordance with Rosemount drawing 03031-1024, Temperature Code T3C; 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)

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; Class I, Division 2, Groups A, B, C and D; Suitable for Class I Zone 2, Group IIC; Type 4X; Factory Sealed; Single Seal (See drawing 03031-1053)

Europe

E8 ATEX Flameproof and Dust
Certificate: KEMA00ATEX2013X; Baseefa11ATEX0275X
Standards: EN60079-0:2012 + A11:2013, EN60079-1:2014, EN60079-26:2015, EN60079-31:2009
Markings:  II 1/2 G Ex db IIC T6...T4 Ga/Gb, T6(–60 °C ≤ T_a ≤ +70 °C), T4/T5(–60 °C ≤ T_a ≤ +80 °C);
 II 1 D Ex ta IIIC T95 °C T_{500} 105 °C Da (–20 °C ≤ T_a ≤ +85 °C)

Table 6. Process Temperature

Temperature class	Process temperature
T6	–60 to +70 °C
T5	–60 to +80 °C
T5	–60 to +120 °C

Special Conditions for Safe Use (X):

1. This device contains a thin wall diaphragm. 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. Some variants of the equipment have reduced markings on the nameplate. Refer to the Certificate for full equipment marking.

I1 ATEX Intrinsic Safety and Dust
Certificate: BAS97ATEX1089X; Baseefa11ATEX0275X
Standards: EN60079-0:2012, EN60079-11:2012, EN60079-31:2009
Markings: HART: Ex 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: Ex II 1 G Ex ia IIC Ga T4(–60 °C ≤ T_a ≤ +60 °C)
DUST: Ex II 1 D Ex ta IIIC T95 °C T_{500} 105 °C Da (–20 °C ≤ T_a ≤ +85 °C)

Table 7. 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):

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 if located in Zone 0.
3. Some variants of the equipment have reduced markings on the nameplate. Refer to the Certificate for full equipment marking.

IA ATEX FISCO
Certificate: BAS97ATEX1089X
Standards: EN60079-0:2012, EN60079-11:2009
Markings: Ex II 1 G Ex ia IIC T4 Ga (–60 °C ≤ T_a ≤ +60 °C)

Table 8. 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. 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 if located in Zone 0.

N1 ATEX Type n and Dust
Certificate: BAS00ATEX3105X; Baseefa11ATEX0275X
Standards: EN60079-0:2012, EN60079-15:2010, EN60079-31:2009
Markings:  II 3 G Ex nA IIC T5 Gc (–40 °C ≤ T_a ≤ +70 °C);
 II 1 D Ex ta IIIC T95 °C T_{500} 105 °C Da (–20 °C ≤ T_a ≤ +85 °C)

Special Conditions for Safe Use (X):

1. This apparatus is not capable of withstanding the 500 V insulation test that is required by 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.

International

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, IEC60079-31:2008
Markings: Ex db IIC T6...T4 Ga/Gb, T6(–60 °C ≤ T_a ≤ +70 °C), T4/T5(–60 °C ≤ T_a ≤ +80 °C);
Ex ta IIIC T95 °C T_{500} 105 °C Da (–20 °C ≤ T_a ≤ +85 °C)

Table 9. Process Temperature

Temperature class	Process temperature
T6	–60 to +70 °C
T5	–60 to +80 °C
T4	–60 to +80 °C

Special Conditions for Safe Use (X):

1. This device contains a thin wall diaphragm. 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. Some variants of the equipment have reduced markings on the nameplate. Refer to the Certificate for full equipment marking.

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 °C ≤ T_a ≤ +40 °C), T4(–60 °C ≤ T_a ≤ +70 °C)
Fieldbus/PROFIBUS: Ex ia IIC T4(–60 °C ≤ T_a ≤ +60 °C)

Table 10. 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):

1. If the apparatus is fitted with 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. 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.

IECEx Mining (Special A0259)
Certificate: IECEx TSA 14.0001X
Standards: IEC60079-0:2011, IEC60079-11:2011
Markings: Ex ia I Ma (–60 °C ≤ T_a ≤ +70 °C)

Table 11. 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 µF	0 µF	<5 nF
Inductance L_i	0 mH	0 mH	<10 µH

Special Conditions for Safe Use (X):

1. If the apparatus is fitted with 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.
3. 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 I applications.

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):

1. The apparatus is not capable of withstanding the 500 V insulation test required by IEC60079-15. This must be taken into account when installing the apparatus.

Brazil

E2 INMETRO Flameproof
Certificate: UL-BR 13.0643X
Standards: ABNT NBR IEC60079-0:2008 + Errata 1:2011,
ABNT NBR IEC60079-1:2009 + Errata 1:2011,
ABNT NBR IEC60079-26:2008 + Errata 1:2008
Markings: Ex d IIC T6/T5 Ga/Gb, T6(–50 °C ≤ T_a ≤ +65 °C), T5(–50 °C ≤ T_a ≤ +80 °C)

Special Conditions for Safe Use (X):

1. This device contains a thin wall diaphragm. 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. In case of repair, contact the manufacturer for information on the dimensions of the flameproof joints.
3. The capacitance of the wrap around label, being 1.6 nF, exceeds the limit in Table 9 of ABNT NBR IEC 60079-0. The user shall determine suitability for the specific application.

I2 INMETRO Intrinsic Safety
Certificate: UL-BR 13.0584X
Standards: ABNT NBR IEC60079-0:2008 + Errata 1:2011, ABNT NBR IEC60079-11:2009
Markings: HART: Ex ia IIC T5/T4 Ga, T5(–60 °C ≤ T_a ≤ +40 °C), T4(–60 °C ≤ T_a ≤ +70 °C)
Fieldbus/PROFIBUS: Ex ia IIC T4 Ga (–60 °C ≤ T_a ≤ +60 °C)

Table 12. 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):

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 a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in Zone 0.

IB INMETRO FISCO
Certificate: UL-BR 13.0584X
Standards: ABNT NBR IEC60079-0:2008 + Errata 1:2011,
ABNT NBR IEC60079-11:2009
Markings: Ex ia IIC T4 Ga (–60 °C ≤ T_a ≤ +60 °C)

Table 13. 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 a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in Zone 0.

China

E3 China Flameproof
Certificate: GYJ14.1041X; GYJ15.1368X [Flowmeters]
Standards: GB12476-2000; GB3836.1-2010, GB3836.2-2010, GB3836.20-2010
Markings: Ex d IIC T6/T5 Ga/Gb, T6(−50 °C ≤ T_a ≤ +65 °C), T5(−50 °C ≤ T_a ≤ +80 °C)

Special Conditions for Safe Use (X):

1. The relation between ambient temperature arrange and temperature class is as follows:

T_a	Temperature class
−50 °C~+80 °C	T5
−50 °C~+65 °C	T6

When used in a combustible dust environment, the maximum ambient temperature is 80 °C.

2. The earth connection facility in the enclosure should be connected reliably.
3. Cable entry certified by notified body with type of protection Ex d IIC in accordance with GB3836.1-2000 and GB3836.2-2000, should be applied when installed in a hazardous location. When used in combustible dust environment, cable entry in accordance with IP66 or higher level should be applied.
4. Obey the warning “Keep tight when the circuit is alive.”
5. End users are not permitted to change any internal components.
6. During installation, use and maintenance of this product, observe the following standards: GB3836.13-1997, GB3836.15-2000, GB3836.16-2006, GB50257-1996, GB12476.2-2006, GB15577-2007.

I3 China Intrinsic Safety
Certificate: GYJ13.1362X; GYJ15.1367X [Flowmeters]
Standards: GB3836.1-2010, GB3836.4-2010, GB3836.20-2010, GB12476.1-2000
Markings: Ex ia IIC Ga T4/T5

Special Conditions for Safe Use (X):

1. Symbol "X" is used to denote specific conditions of use:
   a. If the apparatus is fitted with an optional 90 V transient suppressor, it is not capable of withstanding the 500 V insulation test for 1 minute. This must be taken into account when installing the apparatus.
   b. 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.
2. The relation between T code and ambient temperature range is:

Model	T code	Temperature range
HART	T5	$-60\ °C \leq T_a \leq +40\ °C$
HART	T4	$-60\ °C \leq T_a \leq +70\ °C$
Fieldbus/PROFIBUS/FISCO	T4	$-60\ °C \leq T_a \leq +60\ °C$

3. Intrinsically Safe parameters:

Parameter	HART	Fieldbus/PROFIBUS	FISCO
Voltage U_i	30 V	30V	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 µF	0 µF	<5 nF
Inductance L_i	0 mH	0mH	<10 µH

Note

FISCO parameters apply to both Group IIC and IIB.

[For Flowmeters] When Rosemount 644 Temperature Transmitter is used, the transmitter should be used with Ex-certified associated apparatus to establish explosion protection system that can be used in explosive gas atmospheres. Wiring and terminals should comply with the instruction manual of both Rosemount 644 and associated apparatus. The cables between Rosemount 644 and associated apparatus should be shielded cables (the cables must have insulated shield). The shielded cable has to be grounded reliably in a non-hazardous area.

4. Transmitters comply with the requirements for FISCO field devices specified in IEC60079-27:2008. For the connection of an intrinsically safe circuit in accordance with FISCO Model, FISCO parameters are listed in the table above.
5. The product should be used with Ex-certified associated apparatus to establish explosion protection system that can be used in explosive gas atmospheres. Wiring and terminals should comply with the instruction manual of the product and associated apparatus.
6. The cables between this product and associated apparatus should be shielded cables (the cables must have insulated shield). The shielded cable has to be grounded reliably in a non-hazardous area.

7. End users are not permitted to change any intern components but to settle the problem in conjunction with the manufacturer to avoid damage to the product.
8. During installation, use and maintenance of this product, observe the following standards: GB3836.13-1997, GB3836.15-2000, GB3836.16-2006, GB50257-1996, GB12476.2-2006, GB15577-2007.

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)

Special Condition for Safe Use (X):

1. Symbol "X" is used to denote specific conditions of use: The apparatus is not capable of withstanding the 500 V test to earth for one minute. The must be taken into consideration during installation.

Japan

E4 Japan Flameproof
Certificate: TC20577, TC20578, TC20583, TC20584 [HART]; TC20579, TC20580, TC20581, TC20582 [Fieldbus]
Markings: Ex d IIC T5

Technical Regulations Customs Union (EAC)

EM EAC Flameproof
Certificate: RU C-US.GB05.B.01197
Markings: Ga/Gb Ex d IIC T5/T6 X, T5(–60 °C ≤ T_a ≤ +80 °C), T6(–60 °C ≤ T_a ≤ +65 °C)

Special Condition for Safe Use (X):

1. See certificate for special conditions.

IM EAC Intrinsically Safe
Certificate: RU C-US.GB05.B.01197
Markings: HART: 0Ex ia IIC T4/T5 Ga X, T4(–60 °C ≤ T_a ≤ +70 °C),
T5(–60 °C ≤ T_a ≤ +40 °C)
Fieldbus/PROFIBUS: 0Ex ia IIC T4 Ga X (–60 °C ≤ T_a ≤ +60 °C)

Special Condition for Safe Use (X):

1. See certificate for special conditions.

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

Conduit plugs and adapters

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

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 14. Conduit Plug Thread Sizes

Thread	Identification mark
M20 × 1.5	M20
1/2–14 NPT	1/2 NPT

Table 15. Thread Adapter Thread Sizes

Male thread	Identification mark
M20 × 1.5–6H	M20
1/2–14 NPT	1/2–14 NPT
3/4–14 NPT	3/4–14 NPT
Female thread	**Identification mark**
M20 × 1.5–6H	M20
1/2–14 NPT	1/2–14 NPT
G1/2	G1/2

Special Conditions for Safe Use (X):

1. When the thread adapter 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. G1/2 thread forms are only acceptable for existing (legacy) equipment installations.

Additional Certifications

SBS American Bureau of Shipping (ABS) Type Approval
Certificate: 09-HS446883A-5-PDA
Intended Use: Marine and Offshore Applications — Measurement of either gauge or absolute pressure for liquid, gas, and vapor.

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

SDN Det Norske Veritas (DNV) Type Approval
Certificate: TAA000004F
Intended Use: DNV GL Rules for Classification — Ships and offshore units

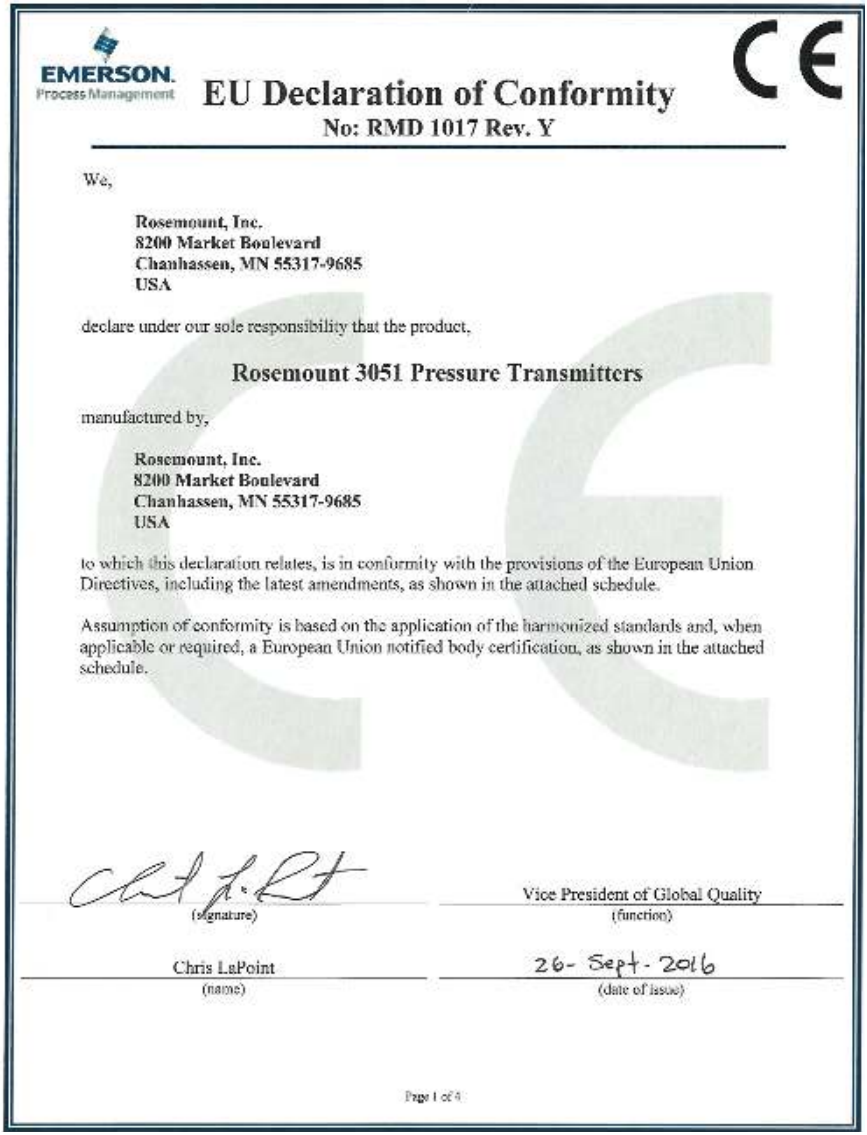
Application:

Location classes	
Temperature	D
Humidity	B
Vibration	A
EMC	B
Enclosure	D

SLL Lloyds Register (LR) Type Approval
Certificate: 11/60002
Application: Environmental categories ENV1, ENV2, ENV3, and ENV5

C5 Custody Transfer - Measurement Canada Accuracy Approval
Certificate: AG-0226; AG-0454; AG-0477

Figure 11. Rosemount 3051 Declaration of Conformity



EMERSON. Process Management

EU Declaration of Conformity

No: RMD 1017 Rev. Y

CE

We,

Rosemount, Inc.
8200 Market Boulevard
Chanhassen, MN 55317-9685
USA

declare under our sole responsibility that the product,

Rosemount 3051 Pressure Transmitters

manufactured by,

Rosemount, Inc.
8200 Market Boulevard
Chanhassen, MN 55317-9685
USA

to which this declaration relates, is in conformity with the provisions of the European Union Directives, including the latest amendments, as shown in the attached schedule.

Assumption of conformity is based on the application of the harmonized standards and, when applicable or required, a European Union notified body certification, as shown in the attached schedule.

(signature)

Vice President of Global Quality
(function)

Chris LaPoint
(name)

26- Sept- 2016
(date of issue)

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EMERSON.
Process Management

EU Declaration of Conformity

No: RMD 1017 Rev. Y

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 - EC Certificate No. 59552-2009-CE-HOU-DNV
Module H Conformity Assessment
Other Standards Used: ANSI/ISA61010-1:2004

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

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EMERSON.
Process Management

EU Declaration of Conformity

No: RMD 1017 Rev. Y

CE

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, EN60079-11:2012

BAS00ATEX3105X - Type n and Certificate
Equipment Group II Category 3 G
Ex nA IIC T5 Gc
Harmonized Standards Used:
EN60079-0:2012, EN60079-15:2010

Baseefa11ATEX0275X - Dust Certificate
Equipment Group II Category 1 D
Ex ta IIIC T95°C T_{sch}105°C Da
Harmonized Standards Used:
EN60079-0:2012, EN60079-31:2009

KEMA00ATEX2013X - Flameproof Certificate
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

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EMERSON
Process Management

EU Declaration of Conformity

No: RMD 1017 Rev. Y

CE

PED Notified Body

Det Norske Veritas (DNV) [Notified Body Number: 0575]
Veritasveien 1, N-1322
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 Baseefa Limited [Notified Body Number: 1180]
Rockhead Business Park
Staden Lane
Buxton, Derbyshire
SK17 9RZ United Kingdom

ATEX Notified Body for Quality Assurance

SGS Baseefa Limited [Notified Body Number: 1180]
Rockhead Business Park
Staden Lane
Buxton, Derbyshire
SK17 9RZ United Kingdom

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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	X	O	O	X	O	O
传感器组件 Sensor Assembly	X	O	O	X	O	O

本表格系依据SJ/T11364的规定而制作.
This table is proposed in accordance with the provision of SJ/T11364.

O: 意为该部件的所有均质材料中该有害物质的含量均低于GB/T 26572所规定的限量要求.
O: Indicate that said hazardous substance in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.

X: 意为在该部件所使用的所有均质材料里，至少有一类均质材料中该有害物质的含量高于GB/T 26572所规定的限量要求.
X: Indicate that said hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.

00825-0100-4007

Quick Start Guide
00825-0100-4007, Rev DD
January 2017

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