

Rosemount 3051 Pressure Transmitter

with 4-20 mA HART[®] and 1-5 Vdc Low Power Protocol

Rosemount 3051CF Series Flowmeter Transmitter

with 4-20 mA HART and 1-5 Vdc Low Power Protocol



NOTICE

This guide provides basic guidelines for Rosemount 3051 Transmitters. It does not provide instructions for configuration, diagnostics, maintenance, service, troubleshooting, Explosion-Proof, Flame-Proof, or intrinsically safe (I.S.) installations. Refer to the 3051 Reference Manual (document number 00809-0100-4001) for more instruction. This manual is also available electronically on www.emersonprocess.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. Please review the approvals section of the 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/Flame-Proof 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. Only use plugs, adapters, glands, or conduit with a compatible thread form when closing these entries.

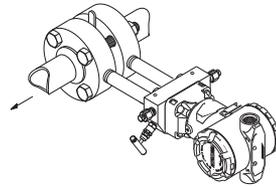
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Step 1: Mount the transmitter

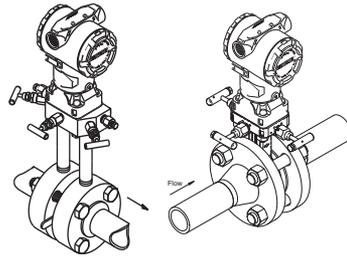
Liquid flow applications

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.



Gas flow applications

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



Steam flow applications

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

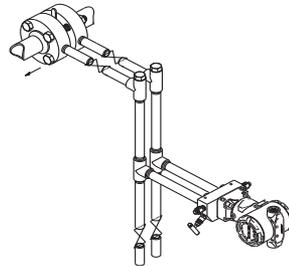
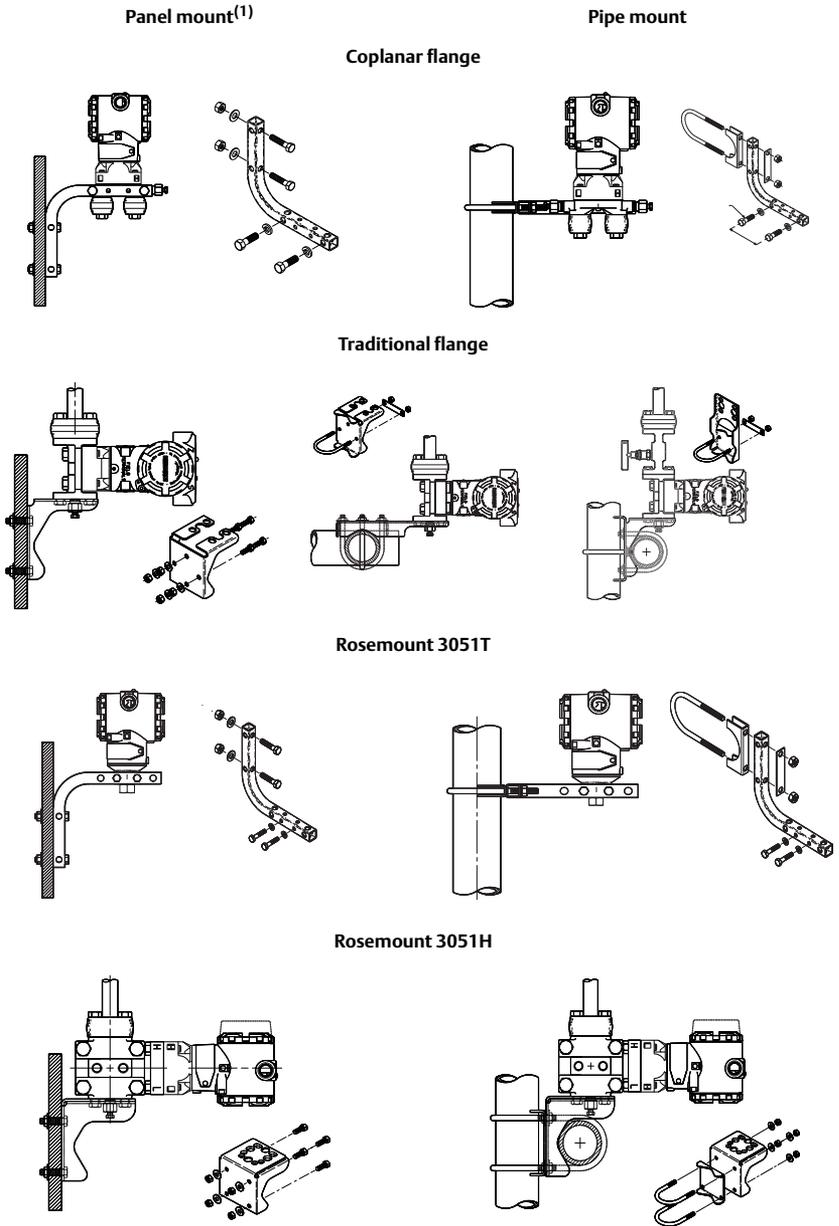


Figure 1. Panel and Pipe Mount

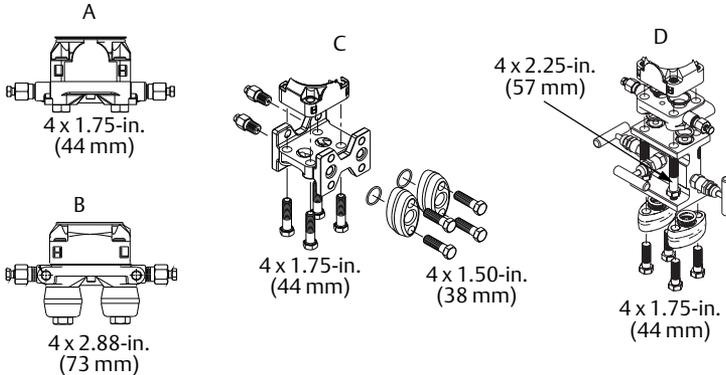


1. Panel bolts are customer supplied.

Bolting considerations

If the transmitter installation requires assembly of the process flanges, manifolds, or flange adapters, follow these 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](#) illustrates common transmitter assemblies with the bolt length required for proper transmitter assembly.

Figure 2. Common Transmitter Assemblies



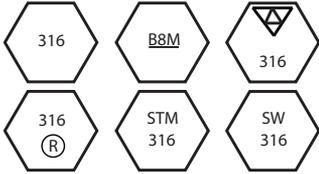
- A. Transmitter with coplanar flange
 B. Transmitter with coplanar flange and optional flange adapters
 C. Transmitter with traditional flange and optional flange adapters
 D. Transmitter with coplanar flange and optional manifold and flange adapters

Bolts are typically carbon steel or stainless steel. Confirm the material by viewing the markings on the head of the bolt and referencing [Table 1](#). If bolt material is not shown in [Table 1](#), contact the local Emerson Process Management 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 1](#) for initial torque value.
4. Torque the bolts to the final torque value using the same crossing pattern. See [Table 1](#) for final torque value.
5. Verify that the flange bolts are protruding through the isolator plate before applying pressure.

Table 1. Torque Values for the Flange and Flange Adapter Bolts

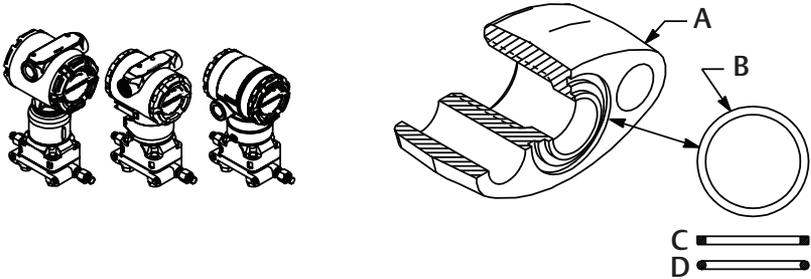
Bolt material	Head markings	Initial torque	Final torque
Carbon Steel (CS)		300 in.-lbs.	650 in.-lbs.
Stainless Steel (SST)		150 in.-lbs.	300 in.-lbs.

O-rings with flange adapters

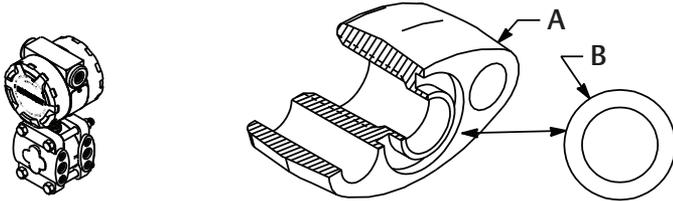
⚠ WARNING

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.

Rosemount 3051S/3051/2051/3095



Rosemount 1151



- A. Flange adaptor
- B. O-ring
- C. PTFE
- D. Elastomer

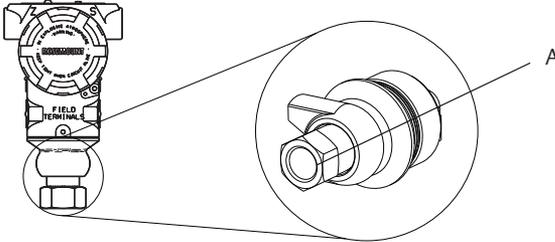
⚠ Whenever the flanges or adaptors are removed, visually inspect the O-rings. Replace them if there are any signs of damage, such as nicks or cuts. If you replace the O-rings, re-torque the flange bolts and alignment screws after installation to compensate for seating of the PTFE O-rings.

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° 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. Inline Gage Low Side Pressure Port



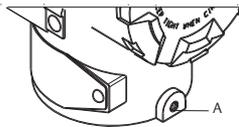
A. Low side pressure port (atmospheric reference)

Step 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.
2. First rotate the housing clockwise to the desired location. If the desired location cannot be achieved due to thread limit, rotate the housing counter clockwise to the desired location (up to 360° from thread limit).
3. Retighten the housing rotation set screw.

Figure 4. Housing Rotation Set Screw



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

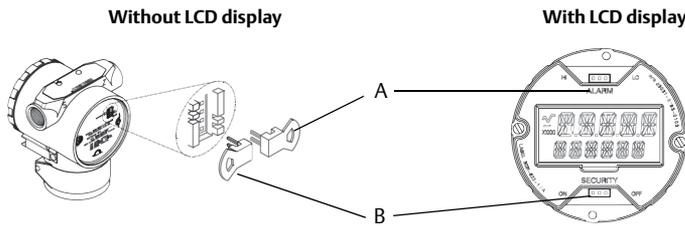
Step 3: Set the jumpers

If alarm and security jumpers are not installed, the transmitter will operate normally with the default alarm condition alarm *high* and the security *off*.

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. Reposition the jumper. Avoid contact with the leads and the terminals. See [Figure 5](#) for the location of the jumper and the ON and OFF positions.

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

Step 4: Connect the wiring and power up

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. Ensure proper grounding. It is important that the instrument cable shield:
 - be trimmed close and insulated from touching the transmitter housing
 - be connected to the next shield if cable is routed through a junction box
 - be connected to a good earth ground at the power supply end

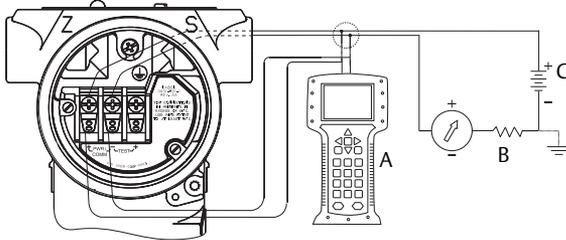
Note

Do not connect the powered signal wiring to the test terminals. Power could damage the test diode in the test connection. Shielded twisted pair cable should be used for best results. Use 24 AWG or larger wire and do not exceed 5,000 feet (1500 meters).

4. Plug and seal unused conduit connections.
5. 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.
6. Replace the housing cover.

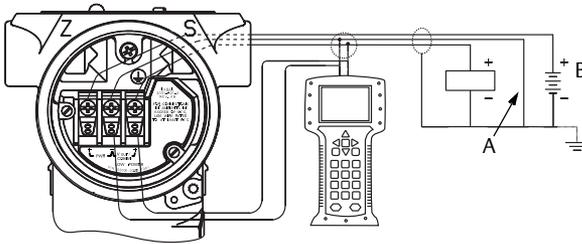
Figure 6 shows wiring connections necessary to power a 3051 and enable communications with a hand-held Field Communicator. For low-power transmitters, refer to the reference manual.

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



- A. Current Meter
 B. $R_l \geq 250 \Omega$
 C. 24 Vdc Supply

Figure 7. Low Power Transmitter Wiring



- A. Voltmeter
 B. 6-12 Vdc Supply

Note

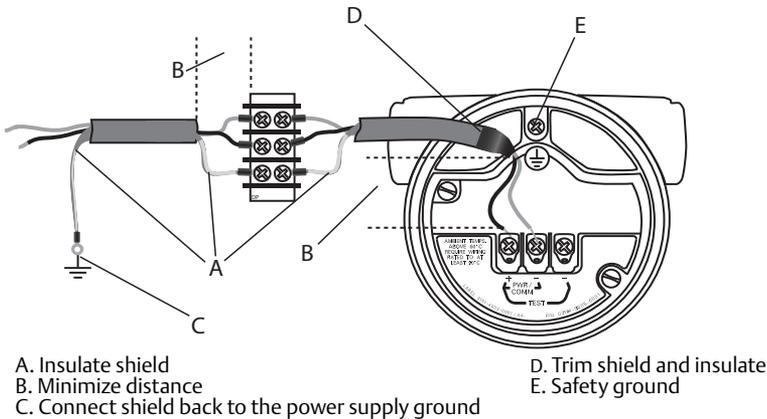
Installation of the transient protection terminal block does not provide transient protection unless the 3051 case is properly grounded.

Signal wiring grounding

Do not run signal wiring in conduit or open trays with power wiring, or near heavy electrical equipment. Grounding terminations are provided on the outside of the electronics housing and inside the Terminal Compartment. These grounds are used when transient protect terminal blocks are installed or to fulfill local regulations. See Step 2 below for more information on how the cable shield should be grounded.

1. Remove the field terminals housing cover.
2. Connect the wiring pair and ground as indicated in [Figure 8](#). The cable shield should:
 - a. Be trimmed close and insulated from touching the transmitter housing.
 - b. Continuously connect to the termination point.
 - c. Be connected to a good earth ground at the power supply end.

Figure 8. Wiring



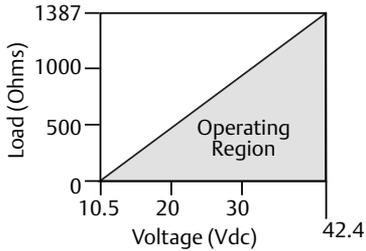
3. Replace the housing cover. It is recommended that the cover be tightened until there is no gap between the cover and the housing.
4. Plug and seal unused conduit connections.

Power supply for 4-20 mA HART

Transmitter operates on 10.5 - 42.4 Vdc. The dc power supply should provide power with less than two percent ripple.

Figure 9. Load Limitation

Maximum Loop Resistance = $43.5 * (\text{Power Supply Voltage} - 10.5)$



The Field Communicator requires a minimum loop resistance of 250Ω for communication.

The total resistance load is the sum of the resistance of the signal leads and the load resistance of the controller, indicator, and related pieces. Note that the resistance of intrinsic safety barriers, if used, must be included.

Power supply for 1-5 Vdc HART Low Power

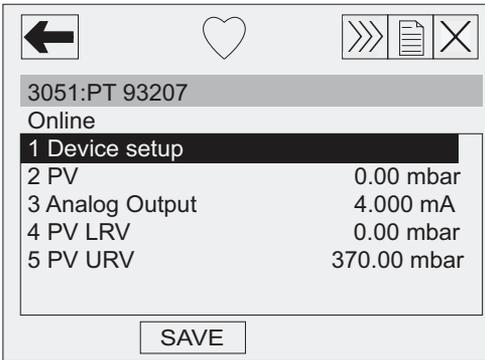
Low power transmitters operate on 6–12 Vdc. The dc power supply should provide power with less than two percent ripple. The V_{out} load should be 100 kW or greater.

Step 5: Verify configuration

Field Communicator user interface

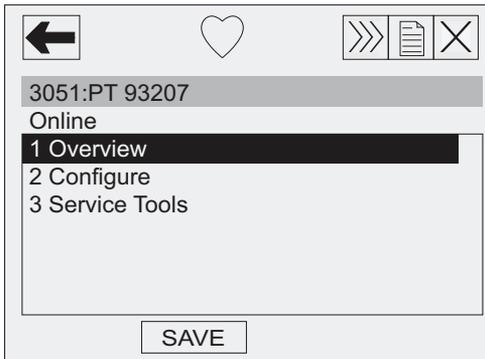
The Traditional Interface - Device Revision 3 and DD Revision 2 Fast Key Sequence can be found on [page 14](#).

Figure 10. Traditional Interface - Device Revision 3 and DD Revision 2



The Device Dashboard - Device Revision 3 and DD Revision 6 Fast Key Sequence can be found on [page 15](#).

Figure 11. Device Dashboard - Device Revision 3 and DD Revision 6



Note

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

Table 2. Traditional Interface - Device Revision 3 and DD Revision 2 Fast Key Sequence

Function	Fast Key sequence
Alarm and Saturation Levels	1, 4, 2, 7
Analog Output Alarm Type	1, 4, 3, 2, 4
Burst Mode Control	1, 4, 3, 3, 3
Burst Operation	1, 4, 3, 3, 3
Custom Meter Configuration	1, 3, 7, 2
Custom Meter Value	1, 4, 3, 4, 3
✓ Damping	1, 3, 6
Date	1, 3, 4, 1
Descriptor	1, 3, 4, 2
Digital To Analog Trim (4-20 mA Output)	1, 2, 3, 2, 1
Disable Local Span/Zero Adjustment	1, 4, 4, 1, 7
Field Device Information	1, 4, 4, 1
Full Trim	1, 2, 3, 3
Keypad Input – Rerange	1, 2, 3, 1, 1
Local Zero and Span Control	1, 4, 4, 1, 7
Loop Test	1, 2, 2
Lower Sensor Trim	1, 2, 3, 3, 2
Message	1, 3, 4, 3
Meter Options	1, 4, 3, 4
Number of Requested Preambles	1, 4, 3, 3, 2
Poll Address	1, 4, 3, 3, 1
Poll a Multidropped Transmitter	Left Arrow, 4, 1, 1
Range Values	1, 3, 3
Rerange	1, 2, 3, 1
Scaled D/A Trim (4–20 mA Output)	1, 2, 3, 2, 2
Self Test (Transmitter)	1, 2, 1, 1
Sensor Info	1, 4, 4, 2
Sensor Temperature	1, 1, 4
Sensor Trim Points	1, 2, 3, 3, 5
Status	1, 2, 1, 1

	Function	Fast Key sequence
✓	Tag	1, 3, 1
	Transfer Function (Setting Output Type)	1, 3, 5
✓	Transmitter Security (Write Protect)	1, 3, 4, 4
	Trim Analog Output	1, 2, 3, 2
✓	Units (Process Variable)	1, 3, 2
	Upper Sensor Trim	1, 2, 3, 3, 3
	Zero Trim	1, 2, 3, 3, 1

Table 3. Device Dashboard - Device Revision 3 and DD Revision 6 Fast Key Sequence

	Function	Fast Key sequence
✓	Alarm and Saturation Levels	1,7,5
	Burst Mode Control	2,2,4,1
	Burst Option	2,2,4,2
	Custom Display Configuration	2,2,3
✓	Damping	2,2,1,2
	Date	2,2,6,1,4
	Descriptor	2,2,6,1,5
	Digital to Analog Trim (4 - 20 mA Output)	3,4,2,1
	Disable Zero & Span Adjustment	2,2,5,2
	Rerange with Keypad	2,2,2,1
	Loop Test	3,5,1
	Lower Sensor Trim	3,4,1,2
	Message	2,2,6,1,6
✓	Range Values	2,2,2
	Scaled D/A Trim (4 - 20 mA Output)	3,4,2,2
	Sensor Temperature/Trend (3051S)	2,2,1,6
✓	Tag	2,2,6,1,1
✓	Transfer Function	2,2,1,3
	Transmitter Security (Write Protect)	2,2,5,1
✓	Units	2,2,1,1
	Upper Sensor Trim	3,4,1,1
	Zero Trim	3,4,1,3

Step 6: Trim the transmitter

Note

Transmitters are shipped fully calibrated per request or by the factory default of full scale (span = upper range limit).

Zero Trim

A zero trim is a single-point adjustment used for compensating mounting position effects. When performing a zero trim, ensure the equalizing valve is open and all wet legs are filled to the correct level.

There are two methods to compensate for mounting effects:

- Field Communicator
- Transmitter Zero Adjustment Buttons

Select the appropriate method and follow instructions below.

Using the Field Communicator

If zero offset is within 3% of URL, follow the [Using the Field Communicator](#) instructions below. This zero trim will affect the 4-20 mA value, the HART PV, and the display value.

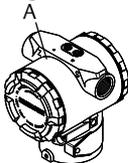
1. Equalize or vent the transmitter and connect Field Communicator.
2. At the menu, input the HART Fast Key sequence (refer to [Table 2](#) or [Table 3](#)).
3. Follow the commands to perform a zero trim.

Using the transmitter Zero Adjustment Buttons

Using the transmitter Zero Adjustment Buttons, the Lower Range Value (LRV) will be set to the pressure applied to the transmitter. This adjustment will affect the 4-20 mA value only. Perform the following steps to perform a rerange using the zero adjustment buttons.

1. Loosen the certifications label screw and slide the label to expose the zero adjustment buttons.
2. Set the 4 mA point by pressing the zero button for 2 seconds. Verify that the output is 4 mA. The optional LCD will display ZERO PASS.

Figure 12. Zero Adjustment Buttons



A. Zero adjustment buttons

Safety Instrumented Systems

The following section applies to 3051C transmitters used in SIS applications.

Installation

No special installation is required in addition to the standard installation practices outlined in this document. Always ensure a proper seal by installing the electronics housing cover(s) so that metal contacts metal.

The loop must be designed so the terminal voltage does not drop below 10.5 Vdc when the transmitter output is 22.5 mA.

Position the security switch to the “ON” position to prevent accidental or deliberate change of configuration data during normal operation.

Configuration

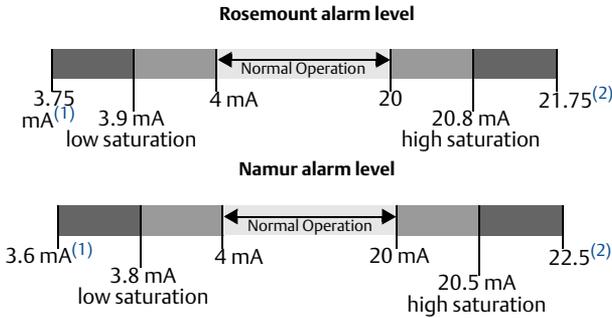
Use any HART-compliant master to communicate with and verify configuration of the 3051.

User-selected damping will affect the transmitters ability to respond to changes in the applied process. The *damping value + response time* must not exceed the loop requirements.

Notes

1. Transmitter output is not safety-rated during the following: configuration changes, multidrop, loop test. Alternative means should be used to ensure process safety during transmitter configuration and maintenance activities.
 2. DCS or safety logic solver must be configured to match transmitter configuration. [Figure 13](#) identifies the two alarm levels available and their operation values. Position the alarm switch to the required HI or LO alarm position.
-

Figure 13. Alarm Levels



(1) Transmitter failure, hardware alarm in LO position.

(2) Transmitter failure, hardware alarm in HI position.

Note

Some detected faults are indicated on the analog output at a level above high alarm regardless of the alarm switch selection.

Operation and maintenance

Proof test and inspection

The following proof tests are recommended. Proof test results and corrective actions taken must be documented at http://rosemount.d1asia.ph/rosemount/safety/ReportAFailure_newweb.asp in the event that an error is found in the safety functionality.

Use the fast key sequences in [Table 2 on page 1-14](#) or [Table 3 on page 1-15](#) to perform a Loop Test, Analog Output Trim, or Sensor Trim. See the 3051 Reference Manual (00809-0100-4001) for additional information.

Proof Test 1⁽¹⁾

This proof test will detect 59.6% of DU failures not detected by the 3051 automatic diagnostics.

1. Execute the Master Reset command to initiate start-up diagnostics.
2. Enter the milliampere value representing a high alarm state
3. Check the reference meter to verify the mA output corresponds to the entered value.
4. Enter the milliampere value representing a low alarm state
5. Check the reference meter to verify the mA output corresponds to the entered value.

1. This test will detect approximately 59.6% of possible DU failures in the transmitter.

Proof-Test 2 ⁽¹⁾

This proof test, when combined with the Five-year Proof-Test, will detect 94.6% of DU failures not detected by the 3051 automatic diagnostics.

1. Execute the Master Reset command to initiate start-up diagnostics.
2. Perform a minimum two point sensor calibration check using the 4-20 mA range points as the calibration points.
3. Check the reference mA meter to verify the mA output corresponds to the pressure input value.
4. If necessary, use one of the “Trim” procedures available in the 3051 Reference Manual to calibrate.

Note

The user determines the proof-test requirements for impulse piping.

Visual inspection

Not required.

Special tools

Not required.

Product repair

All failures detected by the transmitter diagnostics or by the proof-test must be reported. Feedback can be submitted electronically at http://rosemount.d1asia.ph/rosemount/safety/ReportAFailure_newweb.asp.

The 3051 is repairable by major component replacement. Follow the instructions in the 3051 Reference Manual (document number 00809-0100-4001) for additional information.

Reference

Specifications

The 3051 must be operated in accordance to the functional and performance specifications provided in the 3051 Reference Manual.

Failure rate data

The FMEDA report includes failure rates and common cause Beta factor estimates. This report is available at www.emersonprocess.com/rosemount.

3051 safety failure values

Safety accuracy: 0.065%

Safety response time: 100 msec

Product life

50 years – based on worst case component wear-out mechanisms – not based on wear-out process wetted materials

1. This test will detect approximately 94.6% of possible DU failures in the transmitter.

Product Certifications

European Directive Information

A copy of the EC Declaration of Conformity can be found at the end of the Quick Start Guide. The most recent revision of the EC Declaration of Conformity can be found at www.rosemount.com.

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 ≤ Ta ≤ +85 °C); Factory Sealed; Type 4X

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

Certificate: 1Q4A4.AX

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; 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 ≤ Ta ≤ +70 °C) [HART], T5(-50 °C ≤ Ta ≤ +40 °C) [HART]; T4(-50 °C ≤ Ta ≤ +60 °C) [Fieldbus/PROFIBUS®]; Type 4x

Special Conditions for Safe Use (X):

1. The Model 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 Model 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: 1Q4A4.AX

Standards: FM Class 3600 - 1998, 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 ≤ Ta ≤ +60 °C); Type 4x

Special Conditions for Safe Use (X):

1. The Model 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 Model 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.

Canada

- 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 Used: EN60079-0:2012, EN60079-1:2007, EN60079-26:2007, EN60079-31:2009
 Markings:  II ¹/₂ G Ex d IIC T6/T5 Ga/Gb, T6(-50 °C ≤ Ta ≤ +65°C), T5(-50 °C ≤ Ta ≤ +80 °C);
 II 1 D Ex ta IIIC T95 °C T₅₀₀ 105 °C Da (-20 °C ≤ Ta ≤ +85 °C)

Temperature class	Process temperature
T6	-50 °C to +65 °C
T5	-50 °C 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. For information on the dimensions of the flameproof joints the manufacturer shall be contacted.
3. 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:  II 1 G Ex ia IIC T5/T4 Ga, T5(-60 °C ≤ Ta ≤ +40 °C), T4(-60 °C ≤ Ta ≤ +70 °C)Fieldbus/PROFIBUS:  II 1 G Ex ia IIC Ga T4(-60 °C ≤ Ta ≤ +60 °C)DUST:  II 1 D Ex ta IIIC T95 °C T₅₀₀ 105 °C Da (-20 °C ≤ Ta ≤ +85 °C)

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

	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 ≤ Ta ≤ +70 °C);

 II 1 D Ex ta IIIC T95 °C T₅₀₀ 105 °C Da (-20 °C ≤ Ta ≤ +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 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.

International

E7 IECEx Flameproof and Dust

Certificate: IECEx KEM 09.0034X; IECEx BAS 10.0034X

Standards: IEC60079-0:2011, IEC60079-1:2007-04, IEC60079-26:2006,
IEC60079-31:2008

Markings: Ex d IIC T6/T5 Ga/Gb, T6(-50 °C ≤ Ta ≤ +65 °C), T5(-50 °C ≤ Ta ≤ +80 °C);

Ex ta IIIC T95 °C T₅₀₀ 105 °C Da (-20 °C ≤ Ta ≤ +85 °C)

Temperature class	Process temperature
T6	-50 °C to +65 °C
T5	-50 °C 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. For information on the dimensions of the flameproof joints the manufacturer shall be contacted.
3. 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 ≤ Ta ≤ +40 °C), T4(-60 °C ≤ Ta ≤ +70 °C)

Fieldbus/PROFIBUS: Ex ia IIC T4(-60 °C ≤ Ta ≤ +60 °C)

	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 an optional 90 V transient suppressor, it is not capable of withstanding the 500V insulation test required by clause 6.3.12 of 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 ≤ Ta ≤ +70 °C)

	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 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.
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 ≤ Ta ≤ +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 ≤ Ta ≤ +65 °C), T5(-50 °C ≤ Ta ≤ +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.

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 ≤ Ta ≤ +40 °C), T4(-60 °C ≤ Ta ≤ +70 °C)

Fieldbus/PROFIBUS: Ex ia IIC T4 Ga (-60 °C ≤ Ta ≤ +60 °C)

	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 μ F	0 μ F
Inductance L_i	0 mH	0 mH

Special Conditions for Safe Use (X):

1. If the equipment is fitted with an optional 90 V transient suppressor, it is 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 ≤ Ta ≤ +60 °C)

	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 μ H

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; GYJ10.1313X [Flowmeters]

Standards: GB3836.1-2000, GB3836.2-2010, GB12476-2000

Markings: Ex d IIC T6/T5, T6(-50 °C ≤ Ta ≤ +65 °C), T5(-50 °C ≤ Ta ≤ +80 °C)

Special Conditions for Safe Use (X):

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

Ta	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.

- The earth connection facility in the enclosure should be connected reliably.
- 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.
- Obey the warning "Keep tight when the circuit is alive."
- End users are not permitted to change any internal components.
- 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; GYJ101312X [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):

- Symbol "X" is used to denote specific conditions of use:
 - If the apparatus is fitted with an optional 90V 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.
 - 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.
- The relation between T code and ambient temperature range is:

Model	T code	Temperature range
HART	T5	-60 °C ≤ Ta ≤ +40 °C
HART	T4	-60 °C ≤ Ta ≤ +70 °C
Fieldbus/PROFIBUS/FISCO	T4	-60 °C ≤ Ta ≤ +60 °C
Flowmeter with 644 Temp Housing	T4	-40 °C ≤ Ta ≤ +60 °C

3. Intrinsically Safe parameters:

	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	0mH	<10 μ H

Note

FISCO parameters apply to both Group IIC and IIB.

Note

[For Flowmeters] When 644 temperature transmitter is used, the 644 temperature 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 644 temperature transmitter and associated apparatus. The cables between 644 temperatures transmitter 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: GYJ101111X

Standards: GB3836.1-2000, GB3836.8-2003

Markings: Ex nA IIC T5 (-40 °C ≤ Ta ≤ +70 °C)

Special Conditions 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.
2. The ambient temperature range is -40 °C ≤ Ta ≤ +70 °C.
3. Maximum input voltage: 55 V.

4. Cable glands, conduit or blanking plugs, certified by NEPSI with Ex e or Ex n protection type and IP66 degree of protection provided by enclosure, should be used on external connections and redundant cable entries.
5. Maintenance should be done in non-hazardous location.
6. End users are not permitted to change any internal components but to settle the problem in conjunction with manufacturer to avoid damage to the product.
7. During installation, use and maintenance of this product, observe the following standards: GB3836.13-1997, GB3836.15-2000, GB3836.16-2006, GB50257-1996

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.00400

Markings: Ga/Gb Ex d IIC T5/T6 X, T5(-60 °C ≤ Ta ≤ +80 °C), T6(-60 °C ≤ Ta ≤ +65 °C)

Special Condition for Safe Use (X):

See certificate for special conditions.

IM EAC Intrinsically Safe

Certificate: RU C-US.Gb05.B.00400

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 Condition for Safe Use (X):

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 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 4. Conduit Plug Thread Sizes

Thread	Identification mark
M20 x 1.5	M20
$\frac{1}{2}$ - 14 NPT	$\frac{1}{2}$ NPT
G $\frac{1}{2}$ A	G $\frac{1}{2}$

Table 5. Thread Adapter Thread Size

Male thread	Identification mark
M20 x 1.5 – 6H	M20
$\frac{1}{2}$ - 14 NPT	$\frac{1}{2}$ - 14 NPT
$\frac{3}{4}$ - 14 NPT	$\frac{3}{4}$ - 14 NPT
Female thread	Identification mark
M20 x 1.5 – 6H	M20
$\frac{1}{2}$ - 14 NPT	$\frac{1}{2}$ - 14 NPT
PG 13.5	PG 13.5

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. G $\frac{1}{2}$ and PG 13.5 thread forms are only acceptable for existing (legacy) equipment installations.

Additional Certifications

- SBS** American Bureau of Shipping (ABS) Type Approval
 Certificate: 09-HS446883A-PDA
 Intended Use: Measure gauge or absolute pressure of liquid, gas or vapor applications on ABS classed vessels, marine, and offshore installations.
 ABS Rules: 2009 Steel Vessels Rules 1-1-4/7.7, 4-6-2/5.15, 4-8-3/13.1

- SBV** Bureau Veritas (BV) Type Approval
 Certificate: 23155/A3 BV
 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: A-14086

Intended Use: Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards

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 1. EC Declaration of Conformity for 3051 Pressure Transmitters




EC Declaration of Conformity

No: RMD 1017 Rev. V

We,

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

declare under our sole responsibility that the product,

Model 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 Community 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 Community notified body certification, as shown in the attached schedule.



(signature)

Kelly Klein
(name - printed)

Vice President of Global Quality
(function name - printed)

2 Mar 2015
(date of issue)



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Document Rev. T

ROSEMOUNT

EC Declaration of Conformity

No: RMD 1017 Rev. V

EMC Directive (2004/108/EC)

All Models 3051 Pressure Transmitters

EN 61326-1:2006
EN 61326-2-3:2006

PED Directive (97/23/EC)

Models 3051CA4; 3051CD2, 3, 4, 5; 3051HD2, 3, 4, 5; (also with P9 option) Pressure Transmitters

QS Certificate of Assessment - EC Certificate No. 59552-2009-CE-HOU-DNV
Module H Conformity Assessment
Other Standards Used: ANSI/ISA61010-1:2004, EN60770-1:1999

All other model 3051 Pressure Transmitters

Sound Engineering Practice

Transmitter Attachments: Diaphragm Seal - Process Flange - Manifold

Sound Engineering Practice

Model 3051CFx Flowmeter Transmitters

See DSI 1000 Declaration of Conformity for 3051CF Series Flowmeter Information



EC Declaration of Conformity

No: RMD 1017 Rev. V

ATEX Directive (94/9/EC)

Model 3051 Pressure Transmitter

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 T₅₀₀105°C Da
Harmonized Standards Used:
EN60079-0:2012, EN60079-31:2009

KEMA00ATEX2013X - Flameproof Certificate
Equipment Group II Category 1/2 G
Ex d IIC T6 or T5 Ga/Gb
Harmonized Standards Used:
EN60079-0:2012, EN60079-1:2007, EN60079-26:2007



ROSEMOUNT**EC Declaration of Conformity**

No: RMD 1017 Rev. V

PED Notified Body**Model 3051 Pressure Transmitters**

Det Norske Veritas (DNV) [Notified Body Number: 0575]
Veritasveien 1, N-1322
Hovik, Norway

ATEX Notified Bodies for EC Type Examination Certificate

DEKRA [Notified Body Number: 0344]
Utrechtseweg 310, 6812 AR Arnhem
P.O. Box 5185, 6802 ED Arnhem
The Netherlands
Postbank 6794687

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

ATEX Notified Body for Quality Assurance

Baseefa. [Notified Body Number: 1180]
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