

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

with PROFIBUS® PA Protocol



Safety messages

This guide provides basic guidelines for the Rosemount 2051HT Transmitter. It does not provide instructions for configuration, diagnostics, maintenance, service, troubleshooting, Explosion-proof, Flameproof, or intrinsically safe (I.S.) installations.

⚠ CAUTION

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

⚠ WARNING

Explosions could result in death or serious injury.

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

- Before connecting a Field Communicator in an explosive atmosphere, ensure 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.

- Install and tighten process connectors before applying pressure.
- Do not attempt to loosen or remove flange bolts while the transmitter is in service.

Electrical shock can result in death or serious injury.

- Avoid contact with the leads and terminals. High voltage that may be present on leads can cause electrical shock.
- Before connecting a handheld communicator in an explosive atmosphere, ensure 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.

- Install and tighten process connectors before applying pressure.

Physical access

- Unauthorized personnel may potentially cause significant damage to and/or misconfiguration of end users' equipment. This could be intentional or unintentional and needs to be protected against.
- Physical security is an important part of any security program and fundamental to protecting your system. Restrict physical access by unauthorized personnel to protect end users' assets. This is true for all systems used within the facility.

⚠ WARNING

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

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

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

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

Physical access

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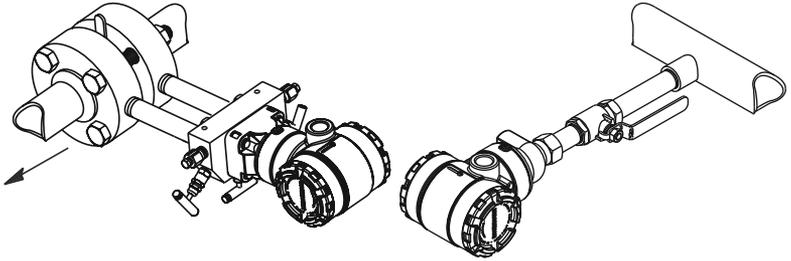
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1 Mount the transmitter

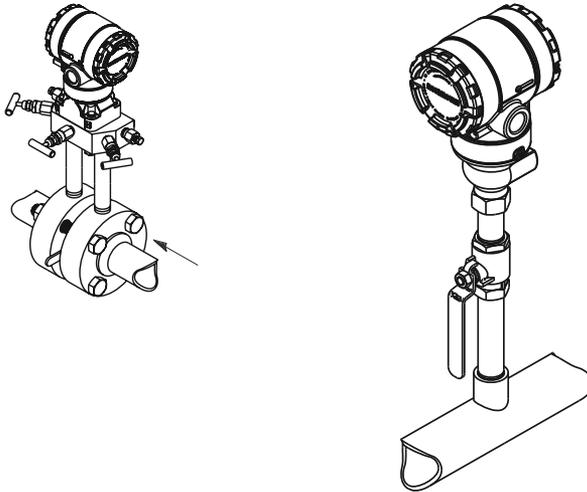
1.1 Liquid applications



Procedure

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

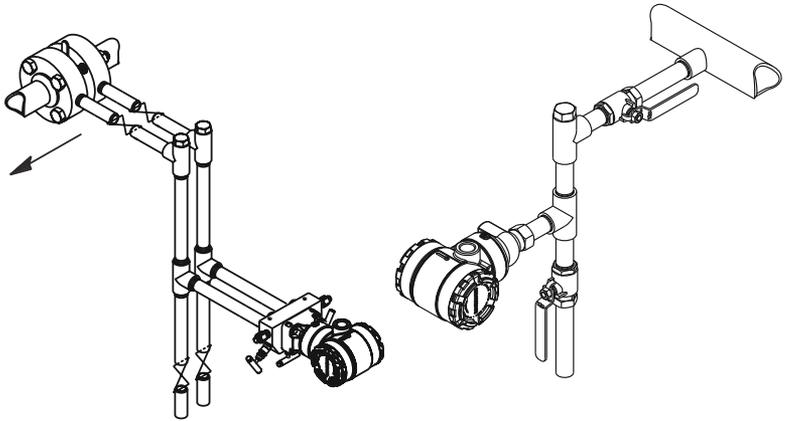
1.2 Gas applications



Procedure

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

1.3 Steam applications



Procedure

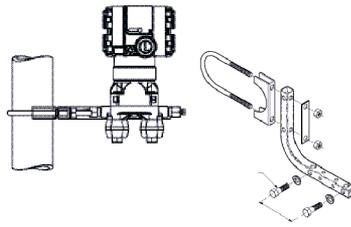
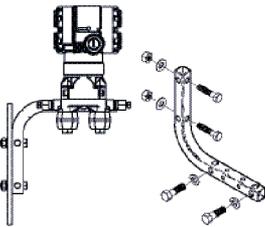
1. Place taps to the side of the line.
2. Mount beside or below the taps.
3. Fill impulse lines with water.

Figure 1-1: Panel and Pipe Mounting

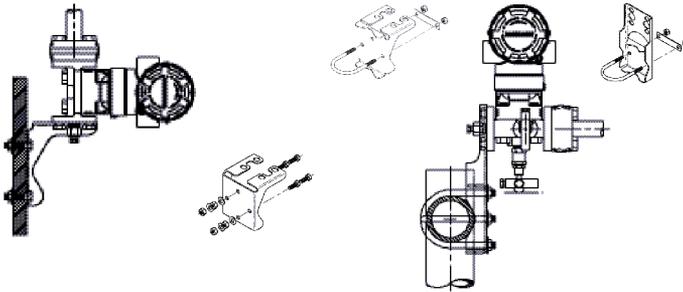
Panel mount⁽¹⁾

Pipe mount

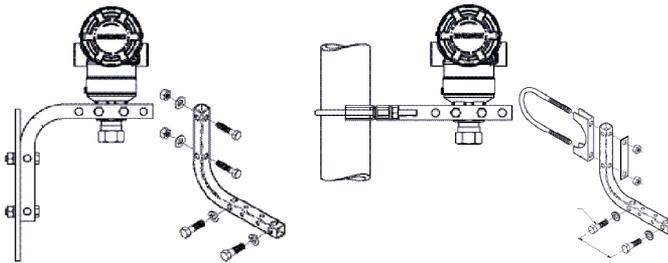
Coplanar flange



Traditional flange



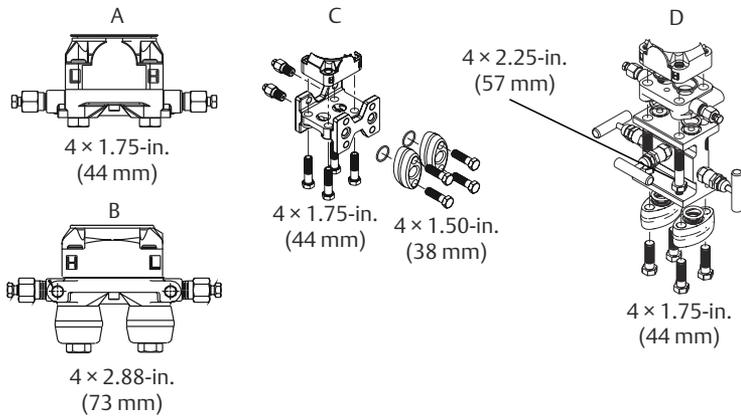
Rosemount 2051T



(1) × 1 panel bolts are customer supplied.

1.4 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 1-2](#) illustrates common transmitter assemblies with the bolt length required for proper transmitter assembly.

Figure 1-2: Common Transmitter Assemblies

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

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

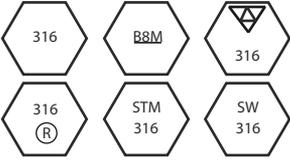
Carbon steel bolts do not require lubrication and the stainless steel bolts are coated with a lubricant to ease installation. However, no additional lubricant should be applied when installing either type of bolt.

Use the following bolt installation procedure:

Procedure

1. Finger tighten the bolts.
2. Torque the bolts to the initial torque value using a crossing pattern. See [Table 1-1](#) for initial torque value.
3. Torque the bolts to the final torque value using the same crossing pattern. See [Table 1-1](#) for final torque value.
4. Verify the flange bolts are protruding through the sensor module bolt holes before applying pressure.

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

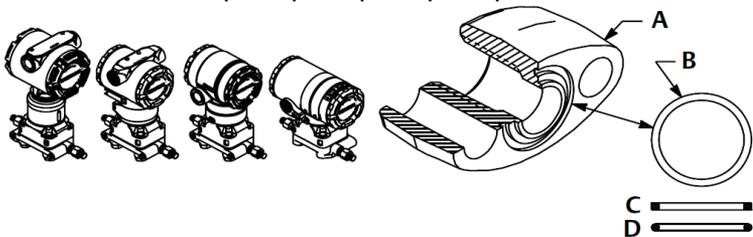
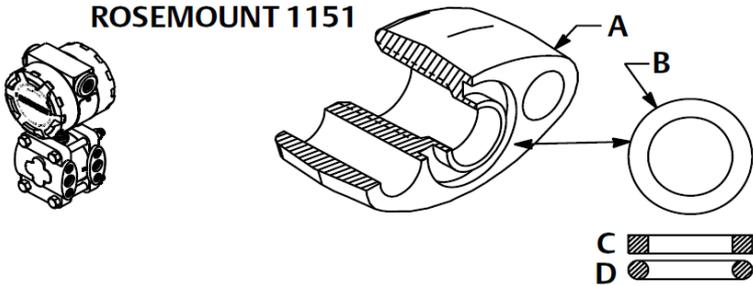
Bolt material	Head markings	Initial torque	Final torque
CS		300 in-lb	650 in-lb
SST		150 in-lb	300 in-lb

1.5 O-rings

The two styles of Rosemount flange adapters (Rosemount 1151 and Rosemount 3051/2051/2024/3095) each require a unique O-ring (see [Figure 1-3](#)). Use only the O-ring designed for the corresponding flange adapter.

⚠ WARNING

Failure to install proper flange adapter O-rings may cause process leaks, which can result in death or serious injury. The two flange adapters are distinguished by unique O-ring grooves. Only use the O-ring that is designed for its specific flange adapter, as shown below. When compressed, PTFE O-rings tend to *cold flow*, which aids in their sealing capabilities.

Figure 1-3: O-rings**ROSEMOUNT 3051S/3051/2051/3001/3095/2024****ROSEMOUNT 1151**

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

Note

You should replace PTFE O-rings if you remove the flange adapter.

1.6 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.

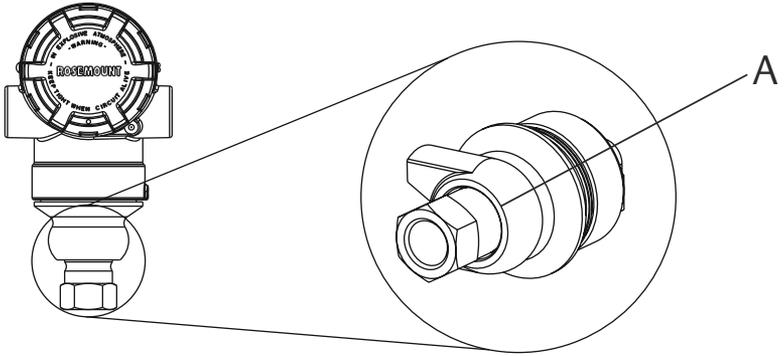
For M20 threads, install conduit plugs to full thread engagement or until mechanical resistance is met.

1.7 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 1-4.](#))

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

Figure 1-4: In-line Gage Low Side Pressure Port

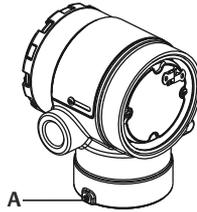


A. Pressure port location

2 Housing rotation

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

Figure 2-1: Housing Rotation



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

Procedure

1. Loosen the housing rotation set screw using a 5/64 -in. hex wrench.
2. Rotate the housing clockwise to the desired location.
3. If the desired location cannot be achieved due to thread limit, rotate the housing counterclockwise to the desired location (up to 360° from thread limit).
4. Re-tighten the housing rotation set screw to no more than 7 in-lbs when desired location is reached.

3 Set jumpers and switches

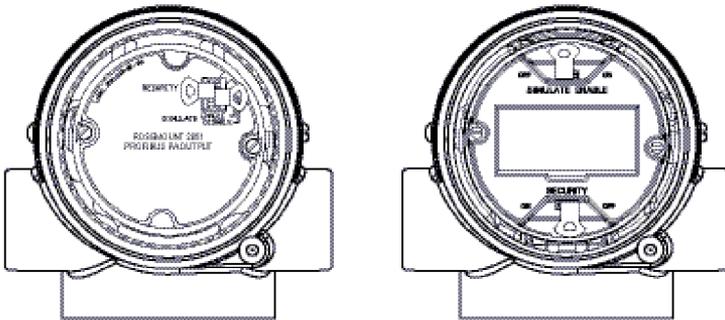
3.1 Security

After the transmitter is configured, you may want to protect the configuration data from unwarranted changes. Each transmitter is equipped with a security jumper that can be positioned ON to prevent the accidental or deliberate change of configuration data. The jumper is labeled “**Security**”. The security jumper also prevents changes made using the Local Operator Interface.

3.2 Simulate

The simulate jumper is used in conjunction with the analog input (AI) block. This jumper is used to simulate the pressure measurement and is used as a lock-out feature for the AI block. To enable the simulate feature, the jumper must be moved to the ON position after power is applied. This feature prevents the transmitter from being accidentally left in simulate mode.

Figure 3-1: Transmitter Jumper Locations



4 Connect wiring and power up

Use the following steps to wire the transmitter:

Procedure

1. Remove the housing cover on the field terminals side.
2. Connect the power leads to the terminals indicated on the terminal block label.
3. Power terminals are polarity insensitive - connect positive or negative to either terminal.
4. Ensure full contact with Terminal Block screw and washer. When using a direct wiring method, wrap wire clockwise to ensure it is in place when tightening the terminal block screw.

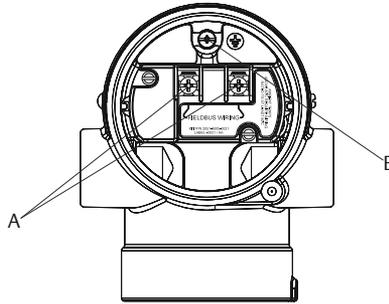
Note

The use of a pin or a ferrule wire terminal is not recommended as the connection may be more susceptible to loosening over time or under vibration.

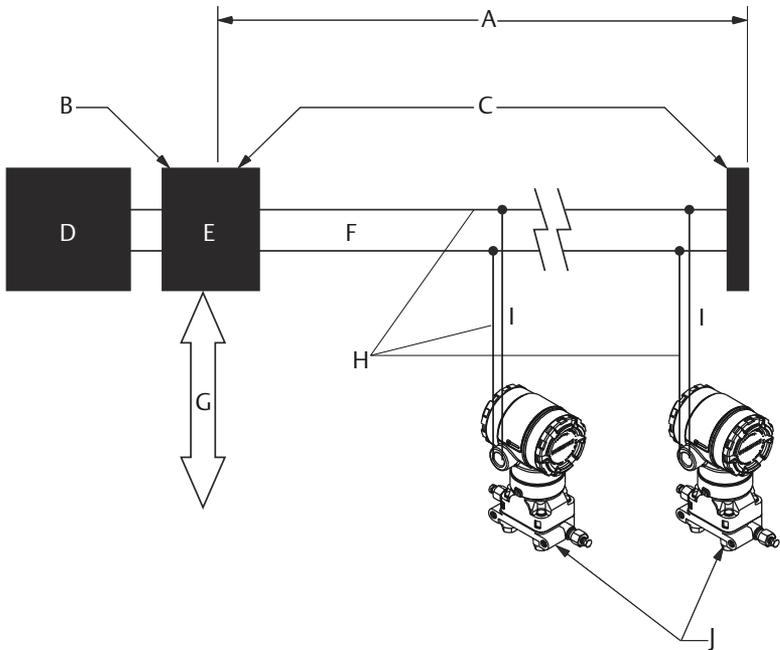
5. Ensure proper grounding. It is important that the instrument cable shield:
 - Be trimmed close and insulated from touching the transmitter housing.
 - Be connected to the next shield if cable is routed through a junction box.
 - Be connected to a good earth ground at the power supply end.
6. Plug and seal unused conduit connections.
7. 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.
8. Replace the housing cover.

Example

Figure 4-1: Terminals



- A. Power terminals
 - B. Ground terminal
-

Figure 4-2: Wiring

- A. 6234 ft. (1900 m) maximum (depending on cable characteristics)
- B. Integrated power conditioner and filter
- C. Terminators
- D. Power supply
- E. DP/PA coupler/link
- F. Trunk
- G. DP network
- H. Signal wiring
- I. Spur
- J. PROFIBUS PA device

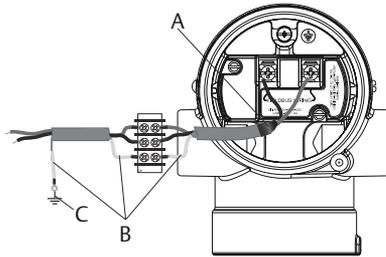
4.1 Signal wiring grounding

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.

Procedure

1. Remove the field terminals housing cover.
2. Connect the wiring pair and ground as indicated in [Figure 4-3](#). The cable shield should:
 - Be trimmed close and insulated from touching the transmitter housing.
 - Continuously connect to the termination point.
 - Be connected to a good earth ground at the power supply end.

Figure 4-3: Wiring



- A. Trim shield and insulate
- B. Insulate shield
- C. Connect shield back to the power supply ground

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.

4.1.1 Power supply

The dc power supply should provide power with less than two percent ripple. The transmitter requires between 9 and 32 Vdc at the terminals to operate and provide complete functionality.

4.1.2 Power conditioner

The DP/PA coupler/link often includes an integrated power conditioner.

4.1.3 Grounding

Transmitters are electrically isolated to 500 Vac rms. Signal wiring cannot be grounded.

4.1.4 Shield wire ground

Shield wire usually requires a single grounding point to avoid creating a ground loop. The ground point is typically at the power supply.

5 Basic configuration

5.1 Configuration tasks

The transmitter can be configured via either the local operator interface (LOI) – option code M4, or via a Class 2 master (DD or DTM™ based). The two basic configuration tasks for the PROFIBUS PA Pressure transmitter are:

Procedure

1. Assign address.
2. Configure engineering units (scaling).

Note

Rosemount 2051 PROFIBUS PA Profile 3.02 devices are set to identification number adaptation mode when shipped from the factory. This mode allows the transmitter to communicate with any PROFIBUS PA control host with either the generic Profile GSD (9700) or Rosemount 2051 specific GSD (3333) loaded on the host; therefore, it is not required to change the transmitter identification number at start-up.

5.1.1 Assign address

The Rosemount 2051 Pressure Transmitter is shipped with a temporary address of 126. This must be changed to a unique value between 0 and 125 in order to establish communication with the host. Usually, addresses 0–2 are reserved for masters or couplers, therefore transmitter addresses between 3 and 125 are recommended.

Address can be set via either:

- LOI – see [Table 5-1](#) and [Figure 5-1](#)
- Class 2 master – see Class 2 Master Manual for setting address

5.1.2 Configure engineering units

Unless otherwise requested, the Rosemount 2051 Pressure Transmitter ships with the following settings:

- Measurement mode: Pressure
- Engineering units: inches H₂O
- Scaling: None

Engineering units should be confirmed or configured before installation. Units can be configured for Pressure, Flow, or Level measurement.

Measurement type, Units, Scaling, and Low Flow Cutoff (when applicable) can be set via either:

- LOI – see [Table 5-1](#) and [Figure 5-1](#)
- Class 2 master – see [Table 5-2](#) for parameter configuration

5.2 Configuration tools

5.2.1 Local operator interface (LOI)

When ordered, the LOI can be used for commissioning the device. To activate the LOI, push either configuration button located under the top tag of the transmitter. See [Table 5-1](#) and [Figure 5-1](#) for operation and menu information. The security jumper prevents changes made using the LOI.

Note

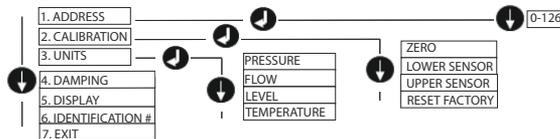
Buttons must be fully engaged ≈ 0.5-in. (10 mm) of travel.

Table 5-1: LOI Button Operation

Button	Action	Navigation	Character Entry	Save?
	Scroll	Moves down menu categories	Changes character value ⁽¹⁾	Changes between Save and Cancel
	Enter	Selects menu category	Enters character and advances	Saves

(1) Characters blink when they can be changed.

Figure 5-1: LOI Menu



5.3 Class 2 Master

The Rosemount 2051 PROFIBUS DD and DTM files are available at Emerson.com/Rosemount or by contacting your local salesperson. See [Table 5-2](#) for steps to configure the transmitter for Pressure measurement. See Rosemount 2051 [Reference Manual](#) for Flow or Level configuration instructions.

Table 5-2: Pressure Configuration via Class 2 Master

Steps	Actions
Set blocks to Out of Service	Put Transducer Block into Out of Service mode
	Put Analog Input Block into Out of Service mode
Select Measurement Type	Set Primary Value type to Pressure
Select Units	Set Engineering Units <ul style="list-style-type: none"> Primary and secondary units must match
Enter Scaling	Set Scale In in Transducer Block to 0–100
	Set Scale Out in Transducer Block to 0–100
	Set PV Scale in Analog Input Block to 0–100
	Set Out Scale in Analog Input Block to 0–100
	Set Linearization in Analog Input Block to No Linearization
Set blocks to Auto	Put Transducer Block into Auto mode
	Put Analog Input Block into Auto mode

5.4 Host integration

5.4.1 Control host (Class 1)

The Rosemount 2051 device utilizes condensed status as recommended by the Profile 3.02 specification and NE 107. See Rosemount 2051 [Reference Manual](#) for condensed status bit assignment information.

The appropriate GSD file must be loaded on the control host - Rosemount 2051 specific (rmt3333.gsd) or Profile 3.02 Generic (pa139700.gsd). These files can be found on Emerson.com/Rosemount or Profibus.com.

5.4.2 Configuration host (Class 2)

The appropriate DD or DTM file must be installed in the configuration host. These files can be found at Emerson.com/Rosemount.

6 Trim the transmitter

Devices are calibrated by the factory. Once installed, it is recommended to perform a zero trim on the sensor to eliminate error due to mounting position or static pressure effects.

This can be done by performing a zero trim via:

- LOI – see [Table 5-1](#) and [Figure 5-1](#)
- Class 2 master – see [Zero trim via Class 2 Master](#) for parameter settings

6.1 Zero trim via Class 2 Master

Procedure

1. Place the transducer block into Out of Service (OOS) mode.
2. Apply zero pressure to device and allow to stabilize.
3. Go to *Basic Setup > Calibration* and set the lower calibration point to 0.0.
4. Place the transducer block to AUTO mode.

7 Rosemount 2051 Product Certifications

Rev 1.13

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.Emerson.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).

Hazardous location certifications

Note

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

7.1 Overview

This Appendix contains information on approved manufacturing locations, European directive information, Ordinary Location certification, Hazardous Locations Certifications and approval drawings.

7.2 Product certifications

Rev 1.13

7.2.1 North America

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

Certificate FM16US0232

Standards FM Class 3600 – 2011, FM Class 3615 – 2006, FM Class 3616 – 2011, FM Class 3810 – 2005, ANSI/NEMA 250 – 2008.
ANSI/IEC 60529 2004

Markings XP CLI, 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 FM16US0231X (HART®)

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 02051-1009; Class I, Zone 0; AEx ia IIC T4; NI CL 1, DIV 2, GP A, B, C, D; T4(-50 °C ≤ T_a ≤ +70 °C); Type 4x

Special Condition for Safe Use (X):

1. The Rosemount 2051 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.

Certificate 2041384 (HART/Fieldbus/Profibus)

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

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 02051-1009; Class I, Zone 0; AEx ia IIC T4; NI CL 1, DIV 2, GP A, B, C, D; T4(-50 °C ≤ T_a ≤ +70 °C); Type 4x

IE USA FISCO

Certificate FM16US0231X

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 02051-1009 (-50 °C ≤ T_a ≤ +60 °C); Type 4x

Special Condition for Safe Use (X):

1. The Rosemount 2051 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.

Certificate 2041384 (HART/Fieldbus/Profibus)

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 IS CL I, DIV 1, GP A, B, C, D when connected per Rosemount drawing 02051-1009(-50 °C ≤ T_a ≤ +60 °C); Type 4x

E6 Canada Explosion-Proof, Dust Ignition Proof

Certificate 2041384

Standards CAN/CSA C22.2 No. 0-10, CSA Std C22.2 No. 25-1966, CSA Std C22.2 No. 30-M1986, CAN/CSA-C22.2 No. 94-M91, CSA Std C22.2 No.142-M1987, CAN/CSA-C22.2 No.157-92, CSA Std C22.2 No. 213-M1987, CAN/CSA-E60079-0:07, CAN/CSA-E60079-1:07, CAN/CSA-E60079-11-02, CAN/CSA-C22.2 No. 60529:05, ANSI/ISA-12.27.01–2003

Markings Explosion-Proof for Class I, Divisions 1, Groups B, C, and D. Dust-Ignition Proof for Class II and Class III, Division 1, Groups E, F, and G. Suitable for Class I, Division 2; Groups A, B, C, and D for indoor and outdoor hazardous locations. Class I Zone 1 Ex d IIC T5. Enclosure type 4X, factory sealed. Single Seal.

I6 Canada Intrinsic Safety

Certificate 2041384

Standards CSA Std. C22.2 No. 142 - M1987, CSA Std. C22.2 No. 213 - M1987, CSA Std. C22.2 No. 157 - 92, CSA Std. C22.2 No. 213 - M1987, ANSI/ISA 12.27.01 – 2003, CAN/CSA-E60079-0:07, CAN/CSA-E60079-11:02

Markings Intrinsically safe for Class I, Division 1, Groups A, B, C, and D when connected in accordance with Rosemount drawing 02051-1008. Ex ia IIC T3C. Single Seal. Enclosure Type 4X

IF Canada FISCO

Certificate 2041384

Standards CSA Std. C22.2 No. 142 - M1987, CSA Std. C22.2 No. 213 - M1987, CSA Std. C22.2 No. 157 - 92, CSA Std. C22.2 No. 213 - M1987, ANSI/ISA 12.27.01 – 2003, CAN/CSA-E60079-0:07, CAN/CSA-E60079-11:02

Markings Intrinsically safe for Class I, Division 1, Groups A, B, C, and D when connected in accordance with Rosemount drawing 02051-1008. Ex ia IIC T3C. Single Seal. Enclosure Type 4X

7.2.2 Europe

E1 ATEX Flameproof

Certificate KEMA 08ATEX0090X

Standards EN 60079-0:2012 + A11:2013, EN 60079-1:2014, EN 60079-26:2015

Markings  II 1/2 G Ex db IIC Ga/Gb T6 ($-60\text{ °C} \leq T_a \leq +70\text{ °C}$), T4/T5 ($-60\text{ °C} \leq T_a \leq +80\text{ °C}$)

Table 7-1: Process Connection Temperature

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

Special Conditions for Safe Use (X):

1. Appropriate cable, glands and plugs need to be suitable for a temperature of 5°C greater than maximum specified temperature for location where installed.
2. Non- standard paint options may cause risk from electrostatic discharge. Avoid installations that could cause electrostatic build-up on painted surfaces, and only clean the painted surfaces with a damp cloth. If paint is ordered through a special option code, contact the manufacturer for more information.
3. The device contains a thin wall diaphragm less than 1 mm thickness that forms a boundary between zone 0 (process connection) and zone 1 (all other parts of the equipment). The model code and datasheet are to be consulted for details of the diaphragm material. Installation, maintenance and use shall take into account the environmental conditions to which the diaphragm shall be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.
4. Flameproof joints are not intended for repair.

I1 ATEX Intrinsic Safety

Certificate Baseefa08ATEX0129X

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

Markings  II 1 G Ex ia IIC T4 Ga ($-60\text{ °C} \leq T_a \leq +70\text{ °C}$)

Table 7-2: Input Parameters

Input parameter	HART®	Fieldbus/PROFIBUS®
Voltage U_i	30 V	30 V
Current I_i	200 mA	300 mA

Table 7-2: Input Parameters (continued)

Input parameter	HART®	Fieldbus/PROFIBUS®
Power P_i	1 W	1.3 W
Capacitance C_i	0.012 μ F	0 μ F
Inductance L_i	0 mH	0 mH

Special Conditions for Safe Use (X):

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

IA ATEX FISCO

Certificate Baseefa08ATEX0129X

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

Markings  II 1 G Ex ia IIC T4 Ga ($-60\text{ }^{\circ}\text{C} \leq T_a \leq +60\text{ }^{\circ}\text{C}$)

Table 7-3: Input Parameters

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

Special Conditions for Safe Use (X):

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

N1 ATEX Type n

Certificate Baseefa08ATEX0130X

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

Markings  II 3 G Ex nA IIC T4 Gc ($-40\text{ °C} \leq T_a \leq +70\text{ °C}$)

Special Condition for Safe Use (X):

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

ND ATEX Dust

Certificate Baseefa08ATEX0182X

Standards EN60079-0:2012+A11:2013, EN60079-31:2009

Markings  II 1 D Ex ta IIC T95 °C T₅₀₀ 105 °C Da ($-20\text{ °C} \leq T_a \leq +85\text{ °C}$)

Special Conditions for Safe Use (X):

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

7.2.3 International

E7 IECEx Flameproof

Certificate IECExKEM08.0024X

Standards IEC 60079-0:2011, IEC 60079-1:2014-06, IEC 60079-26:2014-10

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

Table 7-4: Process Connection Temperature

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

Special Conditions for Safe Use (X):

1. The device contains a thin wall diaphragm less than 1 mm thickness that forms a boundary between zone 0 (process connection) and zone 1 (all other parts of the equipment). The model code and datasheet are to be consulted for details of the diaphragm material.

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

2. Appropriate cable, glands and plugs need to be suitable for a temperature of 5°C greater than maximum specified temperature for location where installed.
3. Flameproof joints are not intended for repair.
4. Non-standard paint options may cause risk from electrostatic discharge. Avoid installations that could cause electrostatic build-up on painted surfaces, and only clean the painted surfaces with a damp cloth. If paint is ordered through a special option code, contact the manufacturer for more information.

17 IECEx Intrinsic Safety

Certificate	IECEX BAS 08.0045X
Standards	IEC60079-0:2011, IEC60079-11:2011
Markings	Ex ia IIC T4 Ga (-60 °C ≤ T _a ≤ +70 °C)

Table 7-5: Input Parameters

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

Special Conditions for Safe Use (X):

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

manufacturer’s instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.

IG IECEx FISCO

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

Table 7-6: Input Parameters

Parameter	FISCO
Voltage U _i	17.5 V
Current I _i	380 mA
Power P _i	5.32 W
Capacitance C _i	0 nF
Inductance L _i	0 μH

Special Conditions for Safe Use (X):

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

N7 IECEx Type n

- Certificate** IECEx BAS 08.0046X
- Standards** IEC60079-0:2011, IEC60079-15:2010
- Markings** Ex nA IIC T4 Gc (-40 °C ≤ T_a ≤ +70 °C)

Special Condition for Safe Use (X):

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

7.2.4 Brazil

E2 INMETRO Flameproof

Certificate UL-BR 14.0375X

Standards ABNT NBR IEC60079-0:2008 + Errata 1:2011, ABNT NBR IEC 60079-1:2009 + Errata 1:2011, ABNT NBR IEC 60079-26:2008 + Errata 1:2009

Markings Ex db IIC T6...T4 Ga/Gb IP66, T6(-60 °C ≤ T_a ≤ +70 °C), T4/T5(-60 °C ≤ T_a ≤ +80 °C)

Special Conditions for Safe Use (X):

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

I2 INMETRO Intrinsic Safety

Certificate UL-BR 14.0759X

Standards ABNT NBR IEC 60079-0:2013; ABNT NBR IEC 60079-11:2013

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

Table 7-7: Input Parameters

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

Special Conditions for Safe Use (X):

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

IB INMETRO FISCO**Certificate** UL-BR 14.0759X**Standards** ABNT NBR IEC 60079-0:2008 + Errata 1:2011; ABNT NBR IEC 60079-11:2009**Markings** Ex ia IIC T4 Ga ($-60\text{ °C} \leq T_a \leq +60\text{ °C}$)**Table 7-8: Input Parameters**

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

Special Conditions for Safe Use (X):

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

7.2.5 China**E3 China Flameproof****Certificate** GYJ18.1432X; GYJ15.1366X [Flow meters]**Standards** GB3836.1-2000, GB3836.2-2000, GB3836.20-2010-2010**Markings** Pressure transmitter: Ex d IIC Gb, T6~T4 Ga/Gb

Flow meter: Ex d IIC T5/T6 Ga/Gb

一、产品安全使用特殊条件

证书编号后缀“X”表明产品具有安全使用特殊条件：

1. 涉及隔爆接合面的维修须联系产品制造商。
2. 产品使用厚度小于 1mm 的隔膜作为 0 区（过程连接）和 1 区（产品其他部分）的隔离，安装和维护时严格遵守制造商提供的说明书，一确保安全性。
3. 产品外部涂层可能产生静电危险，使用时须防止产生静电火花，只能用湿布清理。

二、产品使用注意事项

1. 产品温度组别和使用环境温度之间的关系为：

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

2. 产品外壳设有接地端子，用户在使用时应可靠接地。
3. 安装现场应不存在对产品外壳有腐蚀作用的有害气体。
4. 现场安装时，电缆引入口须选用经国家指定防爆检验机构检验认可、具有 Ex dIIC Gb 防爆等级的电缆引入装置或堵封件，冗余电缆引入口须用堵封件有效密封。
5. 用于爆炸性气体环境中，现场安装、使用和维护必须严格遵守“严禁带电开盖！”的警告语。
6. 用户不得自行更换该产品的零部件，应会同产品制造商共同解决运行中出现的故障，以杜绝损坏现象的发生。
7. 产品的安装、使用和维护应同时遵守产品使用说明书、GB3836.13-2013“爆炸性环境 第 13 部分：设备的修理、检修、修复和改造”、GB3836.15-2017“爆炸性环境 第 15 部分：电气装置的设计、选型和安装”、GB3836.16-2017“爆炸性环境 第 16 部分：电气装置的检查和维护”和 GB50257-2014“电气装置安装工程爆炸和火灾危险环境电力装置施工及验收规范”的有关规定。

I3 China Intrinsic Safety

Certificate GY17.1225X; GY15.1365X [Flow meters]

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

Markings Ex ia IIC T4 Ga ($-60^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$)

一、产品安全使用特殊条件

产品防爆合格证号后缀“X”代表产品安全使用有特殊条件：

1. 产品选用铝合金外壳，使用时需注意防止由于冲击或摩擦产生的点燃危险。
2. 当选择 T1 瞬态抑制端子时此设备不能承受 GB3836.4-2010 标准中第 6.3.12 条规定的 500V 交流有效值试验电压的介电强度试验。
3. 当输出选项代码为 X 时，需使用由厂家提供的型号为 701PG 的 SmartPower Green Power Module 电池。产品外壳含有非金属部件，使用时须防止产生静电火花，只能用湿布清理。

二、产品使用注意事项

1. 产品使用环境温度范围：

Transmitter Output	环境温度范围
A、F、W、M	$-60^{\circ}\text{C} \sim +70^{\circ}\text{C}$
F、W (FISCO)	$-60^{\circ}\text{C} \sim +60^{\circ}\text{C}$
X	$-40^{\circ}\text{C} \sim +70^{\circ}\text{C}$

2. 本安电气参数：

表 7-9:

Transmitter Output	最高输入电压 U_i (V)	最大输入电流 I_i (mA)	最大输入功率 P_i (W)	最大内部等效参数	
C_i (nF)	L_i (μH)				
A、M	30	200	1.0	12	0
F、W	30	300	1.3	0	0
F、W (FISCO)	17.5	380	5.32	0	0

注

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

3. 当该产品必须与已通过防爆认证的关联设备配套共同组成本安防爆系统方可使用于爆炸性气体环境。其系统接线必须同时遵守本产品 and 所配关联设备的使用说明书要求，接线端子不得接错。

4. 用户不得自行更换该产品的零部件，应会同产品制造商共同解决运行中出现的故障，以杜绝损坏现象的发生。
5. 产品的安装、使用和维护应同时遵守产品使用说明书、GB3836.13-2013“爆炸性环境 第 13 部分：设备的修理、检修、修复和改造”、GB3836.15-2000“爆炸性气体环境用电气设备 第 15 部分：危险场所电气安装（煤矿除外）”、GB3836.16-2006“爆炸性气体环境用电气设备 第 16 部分：电气装置的检查和维护（煤矿除外）”、GB3836.18-2010“爆炸性环境 第 18 部分：本质安全系统”和 GB50257-2014“电气装置安装工程爆炸和火灾危险环境电力装置施工及验收规范”的有关规定。

7.2.6 Korea

EP Korea Flameproof

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

Markings Ex d IIC T6...T4, T4/T5 ($-60^{\circ}\text{C} \leq T_a \leq +80^{\circ}\text{C}$), T6 ($-60^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$)

Special Conditions for Safe Use (X):

1. See certificate for special conditions.

IP Korea Intrinsic Safety

Certificate 12-KB4BO-0343X, 12-KB4BO-0345X, 13-KB4BO-0205X, 13-KB4BO-0207X

Markings Ex ia IIC T4 ($-60^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$)

Special Conditions for Safe Use (X):

1. See certificate for special conditions.

7.2.7 Japan

E4 Japan Flameproof

Certificate TC20598, TC20599, TC20602, TC20603 [HART]; TC20600, TC20601, TC20604, TC20605 [Fieldbus]

Markings Ex d IIC T5

7.2.8 Technical Regulations Customs Union (EAC)

EM EAC Flameproof

Certificate TC RU C-US.AA87.B.00588

Markings Ga/Gb Ex d IIC X, T5($-50\text{ °C} \leq T_a \leq +80\text{ °C}$), T6($-50\text{ °C} \leq T_a \leq +65\text{ °C}$)

Special Condition for Safe Use (X):

1. See certificate for special conditions.

IM EAC Intrinsically Safe

Certificate TC RU C-US.AA87.B.00588

Markings 0Ex ia IIC T4 Ga X ($-60\text{ °C} \leq T_a \leq +70\text{ °C}$)

Special Condition for Safe Use (X):

1. See certificate for special conditions.

7.2.9 Combinations

K1 Combination of E1, I1, N1, and ND

K2 Combination of E2 and I2

K5 Combination of E5 and I5

K6 Combination of E6 and I6

K7 Combination of E7, I7, N7 and IECEx Dust

IECEx Dust

Certificate IECEx BAS 08.0058X

Standards IEC60079-0:2011, IEC60079-31:2008

Markings Ex tA IIIC T95 °C T500 105 °C Da ($-20\text{ °C} \leq T_a \leq +85\text{ °C}$)

Special Condition for Safe Use (X):

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

KA Combination of E1, I1, and K6

KB Combination of K5 and K6

KC Combination of E1, I1, and K5

KD Combination of K1, K5, and K6

KP Combination of EP and IP

KM Combination of EM and IM

7.3 Additional Certifications

SBS American Bureau of Shipping (ABS) Type Approval

- Certificate** 18-HS1753847-PDA
- Intended Use** Marine & Offshore Applications – Measurement of either Gauge or Absolute Pressure for Liquid, Gas, and Vapor
- ABS Rules** 2018 Steel Vessels Rules 1-1-4/7.7, 1-1-Appendix 3, 1-1-Appendix 4

SBV Bureau Veritas (BV) Type Approval

- Certificate** 23157/BV
- BV Rules** Bureau Veritas Rules for the Classification of Steel Ships
- Application** Class notations: AUT-UMS, AUT-CCS, AUT-PORT and AUT-IMS; Pressure transmitter type 2051 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	
Type	Rosemount 2051
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

7.4 Rosemount 2051 Declaration of Conformity

	<h2 style="margin: 0;">EU Declaration of Conformity</h2> <p style="margin: 0;">No: RMD 1071 Rev. M</p>	
<p>We,</p> <p style="margin-left: 40px;">Rosemount, Inc. 8200 Market Boulevard Chanhassen, MN 55317-9685 USA</p> <p>declare under our sole responsibility that the product,</p> <p style="text-align: center;">Rosemount™ Model 2051 Pressure Transmitter</p> <p>manufactured by,</p> <p style="margin-left: 40px;">Rosemount, Inc. 8200 Market Boulevard Chanhassen, MN 55317-9685 USA</p> <p>to which this declaration relates, is in conformity with the provisions of the European Union Directives, including the latest amendments, as shown in the attached schedule.</p> <p>Assumption of conformity is based on the application of the harmonized standards and, when applicable or required, a European Union notified body certification, as shown in the attached schedule.</p>		
 <hr style="border: 0; border-top: 1px solid black;"/> <p>(signature)</p>	<p>Vice President of Global Quality</p> <hr style="border: 0; border-top: 1px solid black;"/> <p>(function)</p>	
<p>Chris LaPoint</p> <hr style="border: 0; border-top: 1px solid black;"/> <p>(name)</p>	<p>1-Feb-19.; Shakopee, MN USA</p> <hr style="border: 0; border-top: 1px solid black;"/> <p>(date of issue & place)</p>	
<p>Page 1 of 3</p>		



EU Declaration of Conformity

No: RMD 1071 Rev. M



EMC Directive (2014/30/EU)

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

PED Directive (2014/68/EU)

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

QS Certificate of Assessment - Certificate No. 12698-2018-CE-ACCREDIA
Module H Conformity Assessment
Other Standards Used:
ANSI / ISA 61010-1:2004

Note – previous PED Certificate No. 59552-2009-CE-HOU-DNV

All other Rosemount 2051 Pressure Transmitters

Sound Engineering Practice

Transmitter Attachments: Diaphragm Seal, Process Flange, or Manifold

Sound Engineering Practice

Rosemount 2051CFx DP Flowmeter

See DSI 1000 Declaration of Conformity

ATEX Directive (2014/34/EU)

Baseefa08ATEX0129X - Intrinsic Safety Certificate

Equipment Group II Category 1 G
Ex ia IIC T4 Ga
Harmonized Standards Used:
EN60079-0:2012+A11:2013, EN60079-11:2012

Baseefa08ATEX0130X - Type n Certificate

Equipment Group II Category 3 G
Ex nA IIC T4 Gc
Harmonized Standards Used:
EN60079-0:2012+A11:2013, EN60079-15:2010

KEMA08ATEX0090X - 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

Baseefa08ATEX0182X - Dust Certificate

Equipment Group II Category 1 D
Ex ta IIIC T95°C T₅₀₀105°C Da
Harmonized Standards Used:
EN60079-0:2012+A11:2013, EN60079-31:2014



EU Declaration of Conformity

No: RMD 1071 Rev. M



PED Notified Body

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

*Note – equipment manufactured prior to 20 October 2018 may be marked with the previous PED Notified Body number; previous PED Notified Body information was as follows:
Det Norske Veritas (DNV) [Notified Body Number: 0575]
Veritasveien 1, N-1322
Hovik, Norway*

ATEX Notified Bodies

DEKRA (KEMA) [Notified Body Number: 0344]
Meander 1051
6825 MJ Arnhem
The Netherlands

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

ATEX Notified Body for Quality Assurance

SGS FIMCO OY [Notified Body Number: 0598]
P.O. Box 30 (Särkiniementie 3)
00211 HELSINKI
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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 2051
List of Rosemount 2051 Parts with China RoHS Concentration above MCVs

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



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 [Facebook.com/Rosemount](https://www.facebook.com/Rosemount)

 [Youtube.com/user/RosemountMeasurement](https://www.youtube.com/user/RosemountMeasurement)

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