Rosemount 3051 Pressure Transmitter and Rosemount 3051CF DP Flowmeters

with *Wireless*HART® Protocol

IEC

*Wireless*HART

EMERSON
Process Management

NOTICE

This guide provides basic guidelines for Rosemount 3051 Wireless Transmitters. It does not provide instructions for configuration, diagnostics, maintenance, service, troubleshooting or Intrinsically Safe (I.S.) installations. Refer to the Rosemount 3051 Wireless Reference Manual (document number 00809-0100-4100) for more instruction. This manual is also available electronically on www.rosemount.com.

⚠ WARNING

Explosions could result in death or serious injury.

Installation of this transmitter in an explosive environment must be in accordance with the appropriate local, national, and international standards, codes, and practices. Review the approvals section of the 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.

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.

NOTICE

Shipping considerations for wireless products.

The unit was shipped to you without the power module installed. Remove the power module prior to shipping the unit.
Each power module contains one "D" size primary lithium-thionyl chloride battery. Primary lithium batteries are regulated in transportation by the U.S. Department of Transportation, and are also covered by IATA (International Air Transport Association), ICAO (International Civil Aviation Organization), and ARD (European Ground Transportation of Dangerous Goods). It is the responsibility of the shipper to ensure compliance with these or any other local requirements. Consult current regulations and requirements before shipping.

## Contents

Wireless considerations

Power up sequence

The power module should not be installed on any wireless device until the Smart Wireless Gateway is installed and functioning properly. This transmitter uses the green power module (order model number 701PGNKF). Wireless devices should also be powered up in order of proximity from the Smart Wireless Gateway, beginning with the closest. This will result in a simpler and faster network installation. Enable Active Advertising on the Gateway to ensure that new devices join the network faster. For more information, see the Smart Wireless Gateway Manual (document number 00809-0200-4420).

Connecting the transmitter with a Field Communicator

In order for the Field Communicator to interface with the 3051 Wireless transmitter, the power module must be connected. This transmitter uses the Green power module (order model number 701PGNKF). Figure 1 shows how to connect the Field Communicator to the transmitter. Open the power module compartment to hook up the leads.

Figure 1. Field Communicator Connections
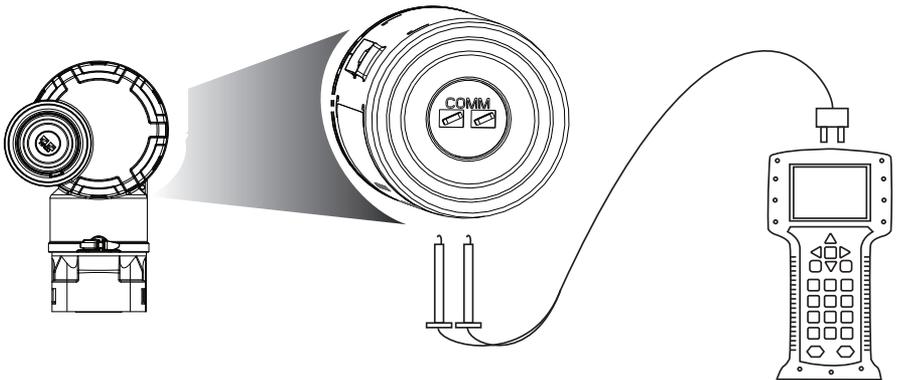
Step 1: Mount the transmitter

Mounting in liquid flow applications

1. Place taps to the side of the line.

2. Mount beside or below the taps.

3. Mount the transmitter so that the drain/vent valves are oriented upward.

Figure 2. Liquid Flow Applications
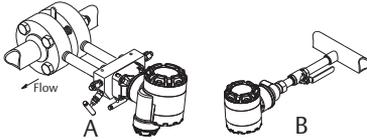
A. Coplanar
B. In-line

Mounting in gas flow applications

1. Place taps in the top or side of the line.

2. Mount beside or above the taps.

Figure 3. Gas Flow Applications
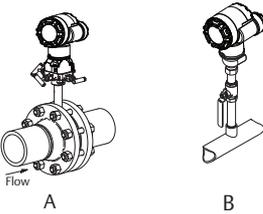
A. Coplanar
B. In-line

Mounting in 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 4. Steam Flow Applications
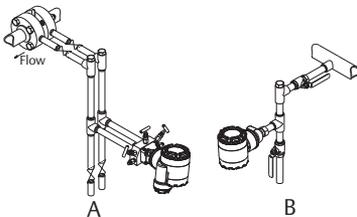
A. Coplanar
B. In-line

Attaching mounting brackets

Figure 5. Panel and Pipe Mount

Panel mount   **Pipe mount**
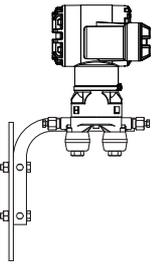
**Coplanar flange**
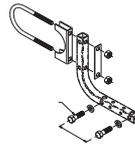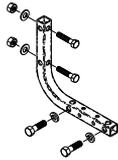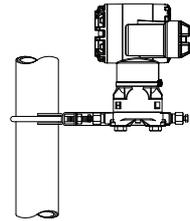
Traditional flange
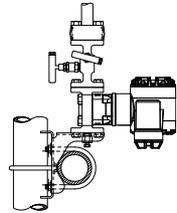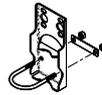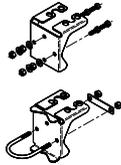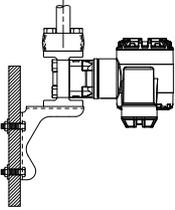
In-line
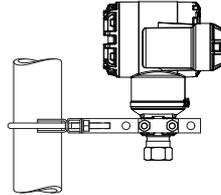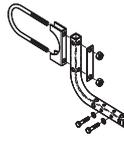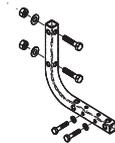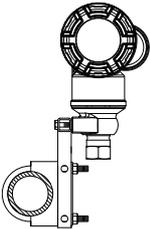
Figure 6. Common Transmitter Assemblies
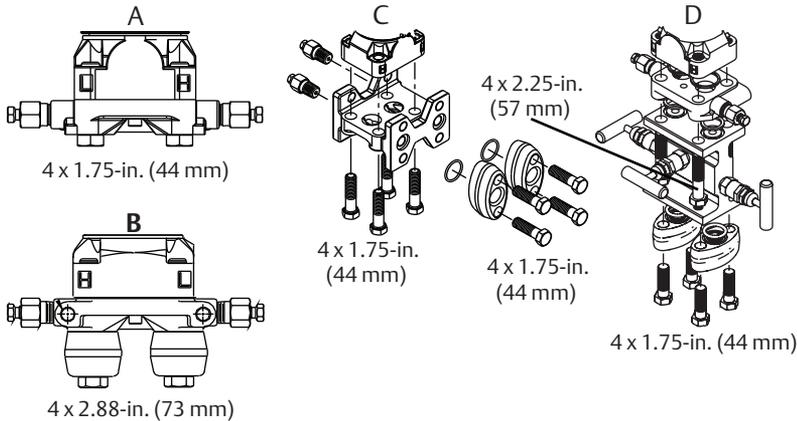
A. Transmitter with coplanar flange
B. Transmitter with coplanar flange and optional flange adapters
C. Transmitter with traditional flange and optional flange adapters
D. Transmitter with coplanar flange and optional manifold and flange adapters

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 on page 7. If bolt material is not shown in Table 1, contact a local Emerson Process Management representative for more information.

Bolt installation

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 the flange bolts are protruding through the isolator plate before applying pressure.

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 Process Management as spare parts. Figure 6 illustrates common transmitter assemblies with the bolt length required for proper transmitter assembly.

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

Bolt material	Head markings			Initial torque	Final torque
Carbon Steel (CS)	B7M			300 in.-lbs.	650 in.-lbs.
Stainless Steel (SST)	316 316 ⓡ	B8M STM 316	316 SW 316	150 in.-lbs.	300 in.-lbs.
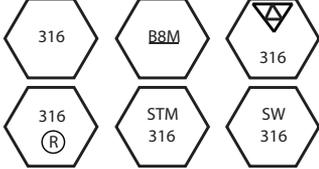
In-line gage transmitter orientation

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 between the housing and sensor of the transmitter. (See Figure 7.)

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 7. In-line Gage Low Side Pressure Port
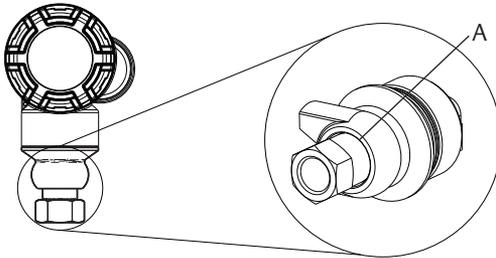
A. Low side pressure port (atmospheric reference)

Consider housing rotation

To improve visibility of optional LCD display:
1. Loosen the housing rotation 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. Re-tighten the housing rotation screw (see Figure 8).

Figure 8. Housing Rotation
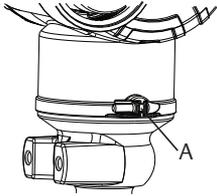
A. Housing rotation screw ($^5/_{64}$-inch hex wrench required)

Step 2: Connect the power module

1. Remove the power module cover.
2. Connect the Green power module (see Figure 9).

Figure 9. Power Module
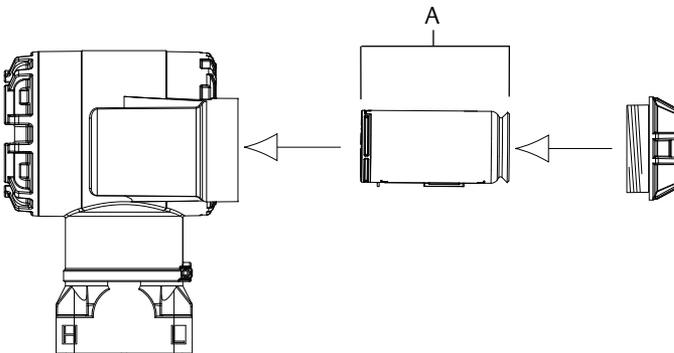
A. Power module

Step 3: Trim the transmitter

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

For instructions using AMS®, see the Rosemount 3051 Wireless Product Manual (00809-0100-4100).

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

⚠ CAUTION

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

Trimming with a Field Communicator

1. Equalize or vent the transmitter and connect Field Communicator.

2. At the menu, input the HART Fast Key sequence.

3. Follow the commands to perform a zero trim.

    From the *HOME* screen, enter the Fast Key sequence

Device Dashboard Fast Keys	2, 1, 2

For connecting with a Field Communicator, refer to Figure 1 on page 3.

Trimming with Digital Zero Trim button

1. Set the transmitter pressure.

2. Remove the electronics housing cover.

3. Press and hold the zero button for two seconds to perform a digital zero trim.

4. Reinstall transmitter housing cover. Ensure a proper seal by installing the electronics housing cover so that polymer contacts polymer (i.e. no o-ring visible).

Figure 10. Digital Zero Button
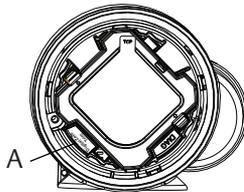
A. Digital zero button

Note

A zero trim can also be completed using AMS Wireless Configurator once the device has joined the network.

Step 4: Verify transmitter configuration

Operation can be verified in four locations:
- At the device via the Local Display (LCD).
- By using the Field Communicator.
- Via the Smart Wireless Gateway's integrated web interface.
- Via AMS Wireless Configurator.

Verify transmitter configuration using LCD display

The LCD will display the output values at the same rate as the wireless update rate. Refer to the Rosemount 3051 Wireless manual for error codes and other LCD messages. Press and hold the Diagnostic button for at least five seconds to display the TAG, Device ID, Network ID, Network Join Status, and Device Status screens.

Searching for Network	Joining Network	Connected with Limited Bandwidth	Connected
NETWK SRCHNG	NETWK NEGOT	NETWK LIM-OP	NETWK OK
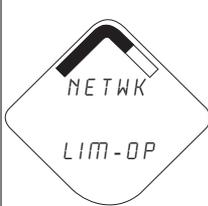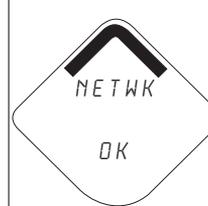
Verify transmitter configuration using Field Communicator

For HART Wireless transmitter communication, a 3051 Wireless Transmitter Device Descriptor is required. For connecting with a Field Communicator, refer to Figure 1 on page 3.

From the *HOME* screen, enter the Fast Key sequence

Device Dashboard Fast Keys	3, 5

Table 2. Device Revision 1, DD Revision 1 Fast Keys

Function	WirelessHART
Tag	2, 1, 1, 1, 1
Date	2, 1, 1, 1, 5
Descriptor	2, 1, 1, 1, 3
Message	2, 1, 1, 1, 4
Long Tag	2, 1, 1, 1, 2
Network ID	2, 2, 1, 1
Join Device to Network	2, 2, 1, 2
Update Rate	2, 1, 4
Range Values	2, 1, 1, 5
Transfer Function	2, 1, 1,6
Units	2, 1, 1, 2
Lower Sensor Trim	3, 5, 1, 1, 2
Upper Sensor Trim	3, 5, 1, 1, 1
Digital Zero Trim	3, 5, 1, 1, 3
Rerange by Applied Pressure	2, 2, 2, 2, 1
Custom Display Configuration	2, 1, 5
Scaled Variable	2, 1, 7, 1
Find Device	3, 5, 2
Simulate Digital Signal	3, 6

Verify transmitter configuration using Smart Wireless Gateway

In the Gateway's integrated web interface, navigate to the **Explorer > Status** page. This page will show whether the device has joined the network and if it is communicating properly.

Note

It may take several minutes for the device to join the network. See Smart Wireless Gateway Quick Start Guide (document number 00825-0200-4420) for more information.

Figure 11. Gateway Network Settings
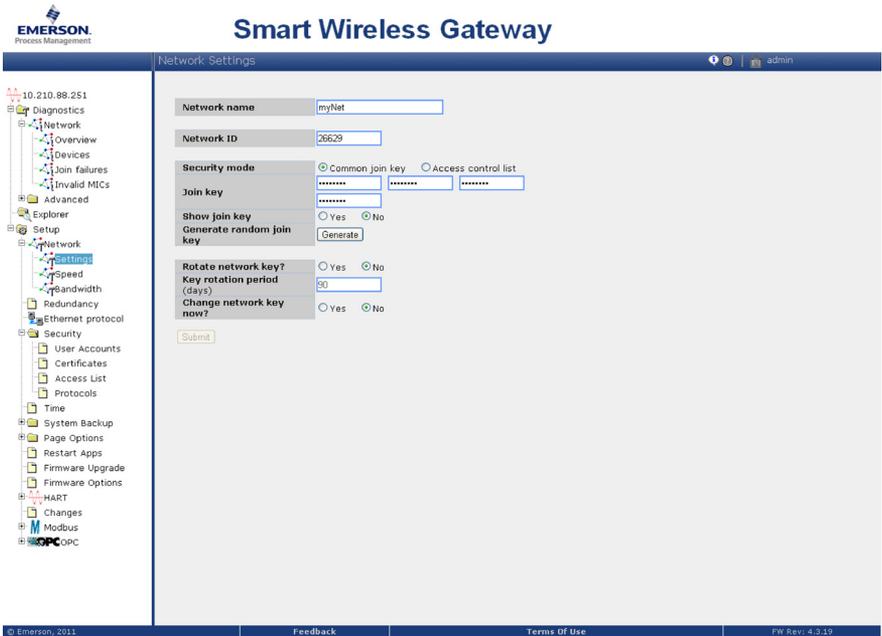
Verifying configuration using AMS Wireless Configurator

When the device has joined the network, it will appear in the Wireless Configurator as shown in Figure 12.

Figure 12. Wireless Configurator Network Setup
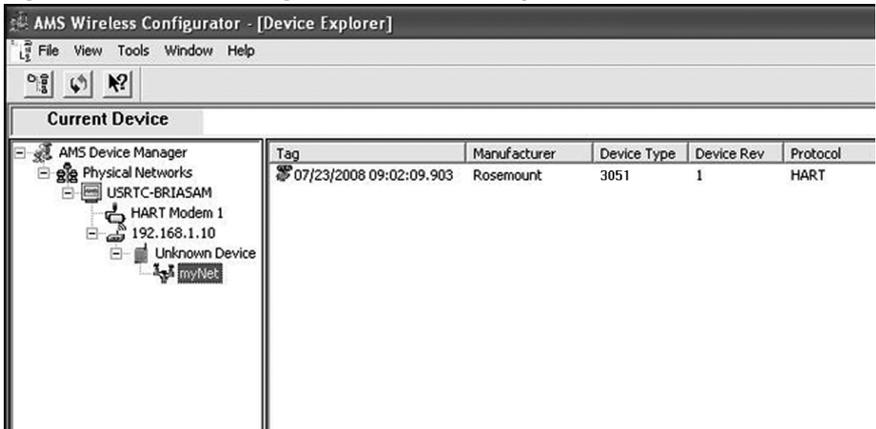
Troubleshooting

If the device has not joined to the network after power up, verify the correct configuration of the Network ID and Join Key. Verify that Active Advertising has been enabled on the Smart Wireless Gateway. The Network ID and Join Key in the device must match the Network ID and Join Key of the Gateway.

The Network ID and Join Key may be obtained from the Smart Wireless Gateway on the **Setup > Network > Settings** page on the web interface (see Figure 11 on page 12). The Network ID and Join Key may be changed in the wireless device by using the following Fast Key sequence. See the manual for further troubleshooting (document number 00809-0100-4100).

From the *HOME* screen, enter the Fast Key sequence

Device Dashboard Fast Keys	3, 5

Product Certifications

Rev 1.0

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.

Telecommunication Compliance

All wireless devices require certification to ensure that they adhere to regulations regarding the use of the RF spectrum. Nearly every country requires this type of product certification.

Emerson is working with governmental agencies around the world to supply fully compliant products and remove the risk of violating country directives or laws governing wireless device usage.

FCC and IC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: This device may not cause harmful interference. This device must accept any interference received, including interference that may cause undesired operation. This device must be installed to ensure a minimum antenna separation distance of 20 cm from all persons.

Ordinary Location Certification from FM Approvals

As standard, the transmitter has been examined and tested to determine that the design meets the basic electrical, mechanical, and fire protection requirements by FM Approvals, a nationally recognized test laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

Installing in North America

The US National Electrical Code (NEC) and the Canadian Electrical Code (CEC) permit the use of Division marked equipment in Zones and Zone marked equipment in Divisions. The markings must be suitable for the area classification, gas, and temperature class. This information is clearly defined in the respective codes.

USA

I5   FM Intrinsic Safety (IS)
Certificate: 3046325
Standards: FM Class 3600 - 2011, FM Class 3610 - 2010, FM Class 3810 - 2005,
            ANSI/ISA 60079-0 - 2009, ANSI/ISA 60079-11 - 2009,
            NEMA 250 - 2003, ANSI/IEC 60529
Markings: IS CL I, DIV 1, GP A, B, C, D T4;
            CL 1, Zone 0 AEx ia IIC T4;
            T4(-40 °C $\le T_a \le$ +70 °C)
            when installed per Rosemount drawing 03031-1062;
            Type 4X/IP66/IP68

Special Conditions for Safe Use (X):

1. The Model 3051 Wireless pressure Transmitter shall only be used with the 701PGNKF Rosemount SmartPower™ Battery Pack.

2. The in-line pressure sensor may contain more than 10% aluminum and is considered a potential risk of ignition by impact or friction. Care must be taken into account during installation and used to prevent impact and friction.

3. The surface resistivity of the transmitter housing is greater than 1GΩ. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.

Canada

I6   CSA Intrinsically Safe
Certificate: 2526009
Standards: CAN/CSA C22.2 No. 0-M91, CAN/CSA C22.2 No. 94-M91,
            CSA Std C22.2 No. 142-M1987, CSA Std C22.2 No. 157-92,
            CSA Std C22.2 No. 60529:05
Markings: Intrinsically Safe for Class I, Division 1, Groups A, B, C, D, T4
            when installed per Rosemount drawing 03031-1063;
            Type 4X/IP66/IP68

Europe

I1   ATEX Intrinsic Safety
Certificate: Baseefa12ATEX0228X
Standards: EN 60079-0: 2012, EN 60079-11: 2012
Markings: ⟨Ex⟩ II 1 G Ex ia IIC T4 Ga, T4(-40 °C $\le T_a \le$ +70 °C)
            IP66/IP68

Special Conditions for Safe Use (X):

1. The plastic enclosure may constitute a potential electrostatic ignition risk and must not be rubbed or cleaned with a dry cloth.

2. The Model 701PGNKF Power Module may be replaced in a hazardous area. The power module has a surface resistivity greater than 1GΩ and must be properly installed in the wireless device enclosure. Care must be taken during transportation to and from the point of installation to prevent electrostatic charge build-up.

International

I7   IECEx Intrinsic Safety
Certificate: IECEx BAS 12.0124X
Standards: IEC 60079-0: 2011, IEC 60079-11: 2011
Markings: Ex ia IIC T4 Ga, T4(-40 °C $\leq$ T$_a$ $\leq$ +70 °C)
           IP66/IP68

Special Conditions for Safe Use (X):
1. The plastic enclosure may constitute a potential electrostatic ignition risk and must not be rubbed or cleaned with a dry cloth.
2. The Model 701PGNKF Power Module may be replaced in a hazardous area. The power module has a surface resistivity greater than 1GΩ and must be properly installed in the wireless device enclosure. Care must be taken during transportation to and from the point of installation to prevent electrostatic charge build-up.

Brazil

I2   INMETRO Intrinsic Safety
Certificate: UL-BR013.0534X
Standards: ABNT NBR IEC60079-0:2008, ABNT NBR IEC60079-11:2009
Markings: Ex ia IIC T4 IP66 Ga, T4(-40 °C $\leq$ T$_a$ $\leq$ +70 °C)
           IP66/IP68

Special Condition for Safe Use (X):
1. See certificate for special conditions

China

I1   China Intrinsic Safety
Certificate: GYJ101312X [Flowmeters]
Standards: GB3836.1-2000, GB3836.4-2000
Markings: Ex ia IIC Ga T46

Special Condition for Safe Use (X):
1. See certificate for special conditions.

EAC - Belarus, Kazakhstan, Russia

IM   Technical Regulation Customs Union (EAC) Intrinsic Safety
Certificate: RU C-US.ГБ05.B.00400
Markings: 0Ex ia IIC T4 Ga X;

Special Condition for Safe Use (X):
1. See certificate for special conditions.

Figure 13. Rosemount 3051 Wireless Declaration of Conformity

ROSEMOUNT   C E

EC Declaration of Conformity
No: RMD 1087 Rev. C

We,

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

declare under our sole responsibility that the product,

Model 2051/3051 Wireless Pressure Transmitter

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.

_____   Vice President of Global Quality
(signature)   (function name - printed)

_____   25 Nov. 2014
Kelly Klein   (date of issue)
(name - printed)

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EC Declaration of Conformity
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$$CE$$

EMC Directive (2004/108/EC)

All Models
Harmonized Standards: EN 61326-1:2006, EN 61326-2-3:2006

R&TTE Directive (1999/5/EC)

All Models
EN 300 328 V 1.8.1
EN 301 489-17: V2.2.1
IEC 61010-1: 2001

PED Directive (97/23/EC)

Models 3051CA4; 3051/2051CG2, 3, 4, 5; 3051/2051CD2, 3, 4, 5; 3051HD2, 3, 4, 5; 3051HG2, 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
Non-harmonized Standards Used: ANSI/ISA61010-1:2004, EN60770-1:1999

All other model 3051/2051 Pressure Transmitters
Sound Engineering Practice

Transmitter Attachments: Diaphragm Seal - Process Flange - Manifold
Sound Engineering Practice

Model 3051CFx/2051CFx Flowmeter Transmitters
Refer to Declaration of Conformity DSI1000

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EC Declaration of Conformity
No: RMD 1087 Rev. C

$C\!E$

ATEX Directive (94/9/EC)

BAS12ATEX0228X Intrinsic Safety Certificate
Equipment Group II Category 1 G
Ex ia IIC T4 Ga (-40°C ≤ Ta ≤ +70°C)
Harmonized Standards:
        EN 60079-0:2012, EN60079-11:2012
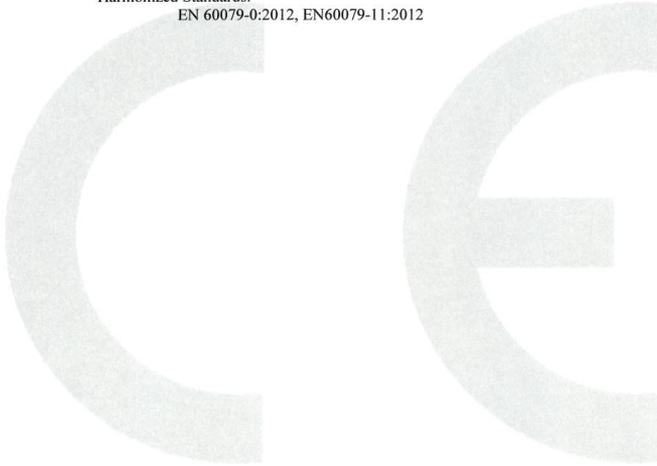
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EC Declaration of Conformity
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CE

PED Notified Body

Model 3051/2051 Pressure Transmitters

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

ATEX Notified Bodies for EC Type Examination Certificate

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]
Rockhead Business Park
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