

Rosemount 3051S Series Pressure Transmitter and Rosemount 3051SF Series Flowmeter

with *WirelessHART*® Protocol



WirelessHART

ROSEMOUNT


EMERSON
Process Management

NOTICE

This guide provides basic guidelines for Rosemount 3051S and 3051S MultiVariable™ Wireless Transmitters (reference manual document number 00809-0100-4802). It does not provide instructions for diagnostics, maintenance, service, or troubleshooting. Refer to the Rosemount 3051S and 3051S MultiVariable Wireless Reference Manual (document number 00809-0100-4802) for more instruction. The manual and this Quick Start Guide are 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 Product Certifications section for any restrictions associated with a safe installation.

- Before connecting a Field Communicator in an explosive atmosphere, ensure the instruments are installed in accordance with intrinsically safe or non-incendive field wiring practices. 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. 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.
- The power module may be replaced in a hazardous area. The power module has surface resistivity greater than one gigaohm 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.

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 two “C” size primary lithium batteries. 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.

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Wireless considerations

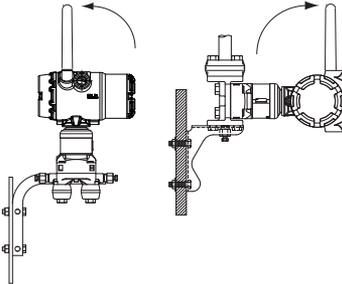
Power up sequence

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 black power module. Order model number 701PBKKF. 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 new devices join the network faster. For more information, see the Smart Wireless Gateway Manual (document number 00809-0200-4420).

Antenna position

Position the antenna vertically, either straight up or straight down. The antenna should be approximately 3 ft. (1 m) from any large structure or building to allow clear communication to other devices.

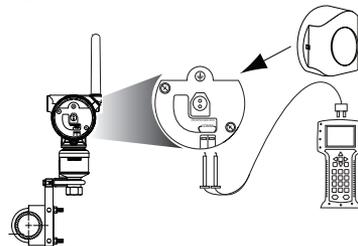
Figure 1. Antenna Position



Field Communicator connections

In order for the Field Communicator to interface with the 3051S or 3051SMV, the power module must be connected. This transmitter uses the black power module. Order model number 701PBKKF.

Figure 2. Field Communicator Connections

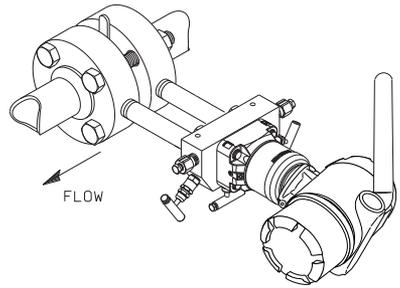


Physical Installation

Step 1: Mount the transmitter

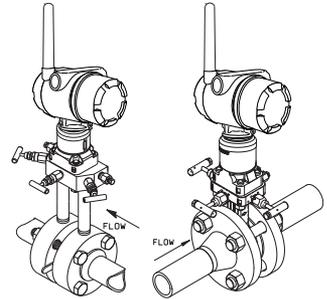
Liquid flow applications

1. Place taps to the side of the line.
2. Mount beside or below the taps.
3. Mount the transmitter so that the drain/vent valves are oriented upward.
4. Position the antenna such that it is vertical, either straight up or straight down.



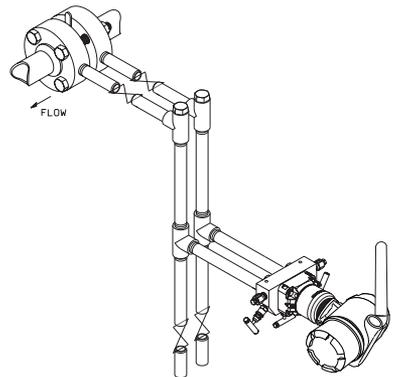
Gas flow applications

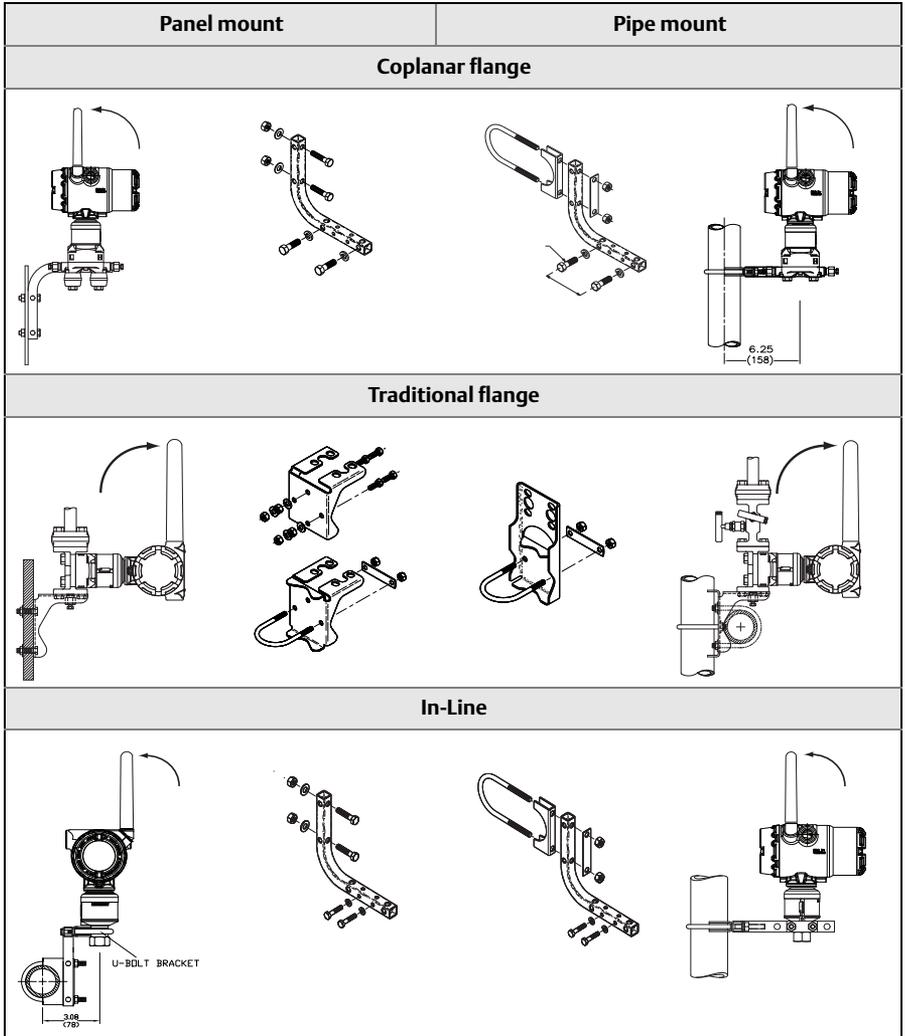
1. Place taps in the top or side of the line.
2. Mount beside or above the taps.
3. Position the antenna such that it is vertical, either straight up or straight down.



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.
4. Position the antenna such that it is vertical, either straight up or straight down.

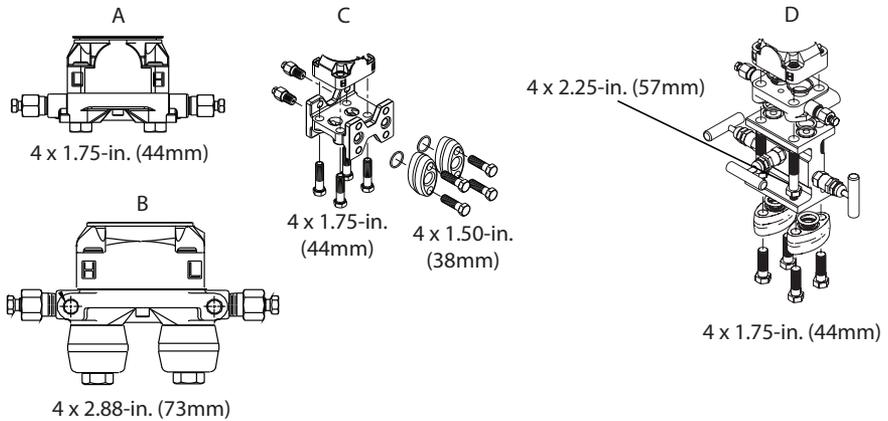




Bolting considerations

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 3](#) illustrates common transmitter assemblies with the bolt length required for proper transmitter assembly.

Figure 3. Common Transmitter Assemblies



- A. Transmitter with Coplanar Flange
 B. Transmitter with Traditional Flange and Optional Flange Adapters
 C. Transmitter with Coplanar Flange and Optional Manifold and Flange Adapters
 D. Transmitter with Coplanar Flange and Optional 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 the flange bolts are protruding through the isolator plate before applying pressure.

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

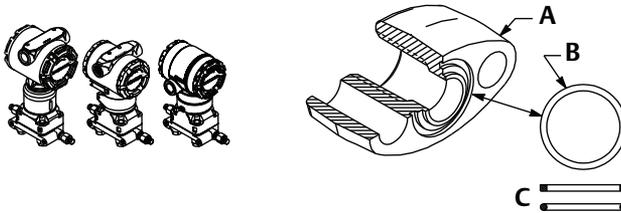
Bolt material	Head markings	Initial torque	Final torque
Carbon Steel (CS)	 	300 in.-lbs.	650 in.-lbs.
Stainless Steel (SST)	     	150 in.-lbs.	300 in.-lbs.

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 / 3051SMV / 3051 / 2051



- A. Flange Adapter
- B. O-ring
- C. PTFE Based Elastomer

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

High gain, remote antenna (optional)

The high gain, remote antenna options provide flexibility for mounting the Rosemount 3051S and 3051SMV Wireless Transmitters based on wireless connectivity, lightning protection, and current work practices.

WARNING

When installing remote mount antennas for the 3051S and 3051SMV Transmitters, always use established safety procedures to avoid falling or contact with high-power electrical lines.

Install remote antenna components for the 3051S and 3051SMV Transmitters in compliance with local and national electrical codes and use best practices for lightning protection.

Before installing consult with the local area electrical inspector, electrical officer, and work area supervisor.

The 3051S and 3051SMV Transmitters remote antenna option is specifically engineered to provide installation flexibility while optimizing wireless performance and local spectrum approvals. To maintain wireless performance and avoid non-compliance with spectrum regulations, do not change the length of cable or the antenna type.

If the supplied remote mount antenna kit is not installed per these instructions, Emerson Process Management is not responsible for wireless performance or non-compliance with spectrum regulations.

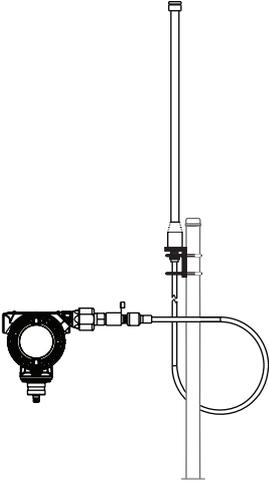
The high gain, remote mount antenna kit includes coaxial sealant for the cable connections for the lightning arrestor and antenna.

Find a location where the remote antenna has optimal wireless performance. Ideally this will be 15 - 25 ft (4,6 - 7,6 m) above the ground or 6 ft (2 m) above obstructions or major infrastructure. To install the remote antenna use the following procedure:

WN option

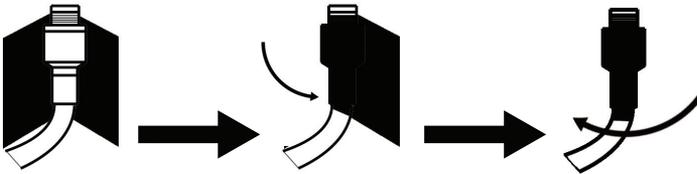
1. Mount the antenna on a 1.5-in. to 2-in. pipe mast using the supplied mounting equipment.
2. Connect the lightning arrestor directly to the top of the 3051S or 3051SMV transmitters.
3. Install the grounding lug, lock washer, and nut on top of lightning arrestor.
4. Connect the antenna to the lightning arrestor using the supplied LMR-400 coaxial cable ensuring the drip loop is not closer than 1 foot (0.3 m) from the lightning arrestor.
5. Use the coaxial sealant to seal each connection between the wireless field device, lightning arrestor, cable, and antenna.
6. Ensure the mounting mast and lightning arrestor are grounded according to local/national electrical code.

Any spare lengths of coaxial cable should be placed in 12-in. (0.3 m) coils.

Figure 4. 3051S Transmitter with High Gain, Remote Antenna

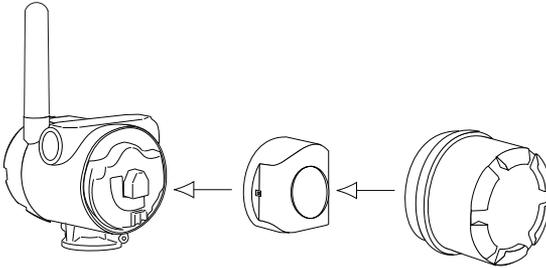
Note: Weather proofing is required!

The remote mount antenna kit includes coaxial sealant for weather proofing the cable connections for the lightning arrester, antenna, and 3051S or 3051SMV Transmitters. Coaxial sealant must be applied to guarantee performance of the wireless field network. See [Figure 5](#) for details on how to apply coaxial sealant.

Figure 5. Applying Coaxial Sealant to Cable Connections

Step 2: Connect the power module

1. Remove the housing cover on the field terminal side.
2. Connect the black power module.



Step 3: 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 and line pressure effects. When performing a zero trim, ensure that the equalizing valve is open and all wet legs are filled to the correct level.

If zero offset is less than 3% of true zero, follow the [Using the Field Communicator](#) instructions below to perform a zero trim.

Using the Field Communicator

HART® Fast Keys	Steps
3, 5, 1, 3	<ol style="list-style-type: none"> 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.

For connecting with a Field Communicator, refer to [Figure 2 on page 3](#).

Note

This can also be completed using AMS® Wireless Configurator once the device has joined the network.

Step 4: Close the housing

Close the housing cover and tighten to safety specification. Always ensure a proper seal by installing the electronics housing covers so that metal contacts metal, but do not over tighten.

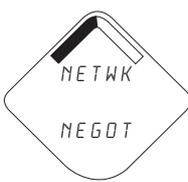
Step 5: Verify operation

Operation can be verified in four locations:

1. At the device via the Local Display (LCD)
2. By using the Field Communicator
3. Via the Smart Wireless Gateway's integrated web interface
4. Via AMS Wireless Configurator

Local display (LCD)

The LCD will display the output values based on the Wireless Update Rate. Refer to the Rosemount 3051S and 3051SMV Wireless manuals 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
			

Field Communicator

For HART Wireless transmitter communication, a 3051S and 3051SMV Wireless DD is required. For connecting with a Field Communicator, refer to [Figure 2 on page 3](#).

Function	Key sequence	Menu items
Communications	3, 4	Join Status, Wireless Mode, Join Mode, Number of Available Neighbors, Number of Advertisements Heard, Number of Join Attempts

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 6. Gateway Network Settings

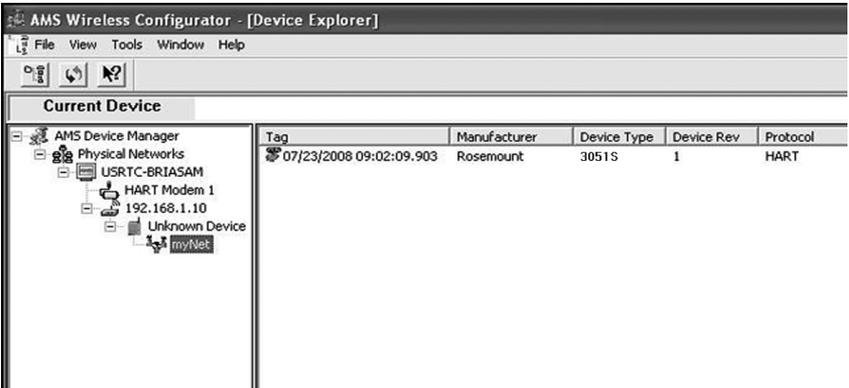
The screenshot displays the 'Network Settings' page of the Smart Wireless Gateway web interface. The interface includes a navigation menu on the left with categories like Diagnostics, Monitor, Explorer, Setup, Network, Ethernet protocol, Security, Time, System Backup, Page Options, Restart Apps, Firmware Upgrade, Firmware Options, HART, Changes, and Trends. The main content area is titled 'Network Settings' and shows the following configuration options:

- Network name:** myNet
- Network ID:** 5455
- Security mode:** Common join key Access control list
- Join key:** 44555354 | 4e455457 | 4f524b53 | 52.4434b
- Show join key:** Yes No
- Generate random join key:**
- Rotate network key?:** Yes No
- Key rotation period (days):** 00
- Change network key now?:** Yes No

A 'Submit' button is located below the configuration options. The footer of the interface contains '© Emerson, 2011', 'Feedback', and 'Terms Of Use'.

AMS Wireless Configurator

When the device has joined the network, it will appear in the Wireless Configurator as illustrated below.



Troubleshooting

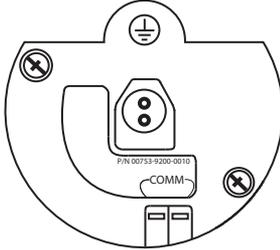
If the device is not joined to the network after power up, verify the correct configuration of the Network ID and Join Key, and verify that Active Advertising has been enabled on the Smart Wireless Gateway. The Network ID and Join Key in the device must match the Network ID and Join Key of the Gateway.

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 6 on page 12](#)). The Network ID and Join Key may be changed in the wireless device by using the following Fast Key sequence.

Function	Key sequence	Menu items
Communications	3, 4	Join Status, Wireless Mode, Join Mode, Number of Available Neighbors, Number of Advertisements Heard, Number of Join Attempts

Reference Information

Figure 7. Terminal Diagram



For connecting with a Field Communicator, refer to [Figure 2 on page 3](#).

Table 2. HART Fast Key Sequence

Function	Key sequence	Menu items
Device Info ⁽¹⁾	2, 2, 9	Manufacturer, Model, Final Assembly Number, Universal, Field Device, Software, Hardware, Descriptor, Message, Date, Model Number I, II, III, SI Unit Restriction, Country
Guided Setup	2, 1	Configure Basic Setup, Zero Sensor Trim, Join Device to Network, Update Rate, Device Display, Alert Setup, Scaled Variable
Manual Setup	2, 2	Configure, Manual Setup, Wireless, Pressure, Device Temperatures, Device Information, Display, Scaled Variable, Other
Wireless	2, 2, 1	Network ID, Join Device to Network, Configure Update Rate, Configure Broadcast Power Level, Power Mode, Power Source

1. If using 3051SMV, use the Fast Key sequence 2, 2 and then navigate to "Device Information."

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.

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).

USA

- I5** FM Intrinsic Safety (IS) and Nonincendive (NI)
 Certificate: 3027705
 Standards: FM Class 3600 - 2011, FM Class 3610 - 2010, FM Class 3611 - 2004, FM Class 3810 - 2005, NEMA 250 - 2003
 Markings: IS CL I, DIV 1, GP A, B, C, D; CL II, DIV 1, GP E, F, G; CL III T4;
 CL 1, Zone 0 AEx ia IIC T4;
 NI CL 1, DIV 2, GP A, B, C, D T4;
 DIP CL II, DIV 1, GP E, F, G; CL III, T5;
 T4(-50 °C ≤ T_a ≤ +70 °C)/T5(-50 °C ≤ T_a ≤ +85 °C);
 when connected per Rosemount drawing 03151-1000; Type 4x

Special Conditions for Safe Use (X):

1. The model 3051SMV Wireless PDP Transmitter shall only be used with the 701PBKKF Rosemount SmartPower™ Battery Pack.
2. The transmitter may contain more than 10% aluminum and is considered a potential risk of ignition by impact or friction.
3. The surface resistivity of the antenna is greater than $1G\Omega$. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.

Canada**16** CSA Intrinsically Safe

Certificate: 1143113

Standards: CAN/CSA C22.2 No. 0-10, CSA Std C22.2 No. 30-M1986,
 CAN/CSA C22.2 No. 94-M91, CSA Std C22.2 No. 142-M1987,
 CSA Std C22.2 No. 157-92, ANSI/ISA 12.27.01-2003,
 CSA Std C22.2 No. 60529:05

Markings: Intrinsically Safe Class I, Division 1; suitable for Class 1, Zone 0, IIC,
 T3C; when connected per Rosemount drawing 03151-1010; Type 4x

Europe**11** ATEX Intrinsic Safety

Certificate: Baseefa13ATEX0127X

Standards: EN 60079-0: 2012, EN 60079-11: 2012

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

Special Conditions for Safe Use (X):

1. The Model 3051S Wireless and Model 3051SMV Wireless 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 a zone 0 area.
2. The surface resistivity of the antenna is greater than $1G\Omega$. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or dry cloth.

International**17** IECEx Intrinsic Safety

Certificate: IECEx BAS 13.0068X

Standards: IEC 60079-0: 2011, IEC 60079-11: 2011

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

Special Conditions for Safe Use (X):

1. The Model 3051S Wireless and Model 3051SMV Wireless 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 a zone 0 area.
2. The surface resistivity of the antenna is greater than $1G\Omega$. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or dry cloth.

Brazil

I2 INMETRO Intrinsic Safety

Certificate: CEPEL 08.1618

Standards: ABNT NBR IEC60079-0:2008, ABNT NBR IEC60079-11:2009,
ABNT NBR IEC60079-26:2008, ABNT NBR IEC 60529:2009

Markings: Ex ia IIC T4/T5 Ga, T4(-60 °C ≤ T_a ≤ +70 °C), T5(-60 °C ≤ T_a ≤ +40 °C),
IP66(AI)/IP66W(SST)

Special Condition for Safe Use (X):

1. See appropriate certificate.
-

Note

Not currently available on the 3051S MultiVariable Wireless Transmitter.

China

I3 China Intrinsic Safety

Certificate: 3051S Wireless: GYJ111401X

3051SFx GYJ11.1707X [Flowmeters]

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

Markings: Ex ia IIC Ga T4, T4(-50 ~ 70 °C)

Special Condition for Safe Use (X):

1. See appropriate certificate.
-

Note

Not currently available on the 3051S MultiVariable Wireless Transmitter.

Japan

I4 TIIS Intrinsically Safe

Certificates: TC18649, TC18650

Markings: Ex ia IIC T4 (-20 ~ 60 °C)

Note

Not currently available on the 3051S MultiVariable Wireless Transmitter.

EAC – Belarus, Kazakhstan, Russia

IM Contact an Emerson Process Management representative for additional information.

Republic of Korea

IP Contact an Emerson Process Management representative for additional information.

Figure 8. Rosemount 3051S Wireless Declaration of Conformity




EC Declaration of Conformity

No: RMD 1099 Rev. B

We,

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

declare under our sole responsibility that the product,

Model 3051S Wireless Series Pressure Transmitters
Model 3051SF Wireless Series Flowmeter Transmitters
Model 300S Housings
Models 3051SMV & 300SMV Wireless 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)

25 Nov. 2014
(date of issue)



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EC Declaration of Conformity

No: RMD 1099 Rev. B

EMC Directive (2004/108/EC)

All Models

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
EN 60950-1: 2001

PED Directive (97/23/EC)

3051S Series Pressure Transmitters

Model 3051S_CA4; 3051S_CD2, 3, 4, 5 (also with P0 & P9 option) Pressure Transmitters

QS Certificate of Assessment – EC Certificate No. 59552-2009-CE-HOU-DNV

Module H Conformity Assessment

Evaluation standards:

ANSI / ISA 61010-1:2004, IEC 60770-1:1999

All other model 3051S Pressure Transmitters

Sound Engineering Practice

All other model 3051SMV Pressure Transmitters

Sound Engineering Practice

Transmitter Attachments: Diaphragm Seal – Process Flange - Manifold

Sound Engineering Practice

3051SF Series Flowmeter Pressure Transmitters

Refer to Declaration of Conformity DS11000


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EC Declaration of Conformity

No: RMD 1099 Rev. B

ATEX Directive (94/9/EC)

Model 3051S Pressure Transmitters and 3051SF Flowmeter Transmitters

Baseefa13ATEX0127X – Intrinsic Safety Certificate

Equipment Group II, Category 1 G

Ex ia IIC T4 Ga (-60°C ≤ Ta ≤ +70°C)

Harmonized Standards Used:

EN 60079-0:2012

EN 60079-11:2012

ROSEMOUNT



EC Declaration of Conformity

No: RMD 1099 Rev. B

PED Notified Body

3051S Series 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]
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United Kingdom



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