

Rosemount™ 648 Wireless Temperature Transmitter

with Rosemount X-well™ Technology



WirelessHART



EMERSON™

Rosemount 648 Wireless Temperature Transmitter

Rosemount 648 Hardware Revision	1
HART® Device Revision	4
Device Install Kit/DD Revision	Device Revision 4, DD Revision 1 or higher

NOTICE

This guide provides basic information for the Rosemount 648 Wireless. It does not provide instructions for detailed configuration, diagnostics, maintenance, service, troubleshooting, or installations. Refer to the Rosemount 648 Wireless [Reference Manual](#) for more instruction. The manual and this guide are also available electronically on EmersonProcess.com/Rosemount.

⚠ WARNING

Failure to follow these installation guidelines could result in death or serious injury.

- Make sure only qualified personnel perform the installation.

Explosions could result in death or serious injury.

- Before connecting a Field Communicator in an explosive atmosphere, make sure the instruments are installed in accordance with intrinsically safe or non-incendive field wiring practices.
- Verify the operating atmosphere of the transmitter is consistent with the appropriate hazardous locations certifications.

Process leaks could result in death or serious injury.

- Do not remove the thermowell while in operation.
- Install and tighten thermowells and sensors before applying pressure.

Electrical shock could cause 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 operations.
- This device must be installed to ensure a minimum antenna separation distance of 20 cm from all person.
- The black power module may be replaced in a hazardous area. The black power module has surface resistivity greater than one giga-ohm 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.

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NOTICE

Shipping considerations for wireless products: (lithium battery: black power module, model number 701PBKKF)

The unit was shipped to you without the black power module installed. Remove the black power module prior to shipping the unit.

Each black 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.

1.0 Wireless considerations

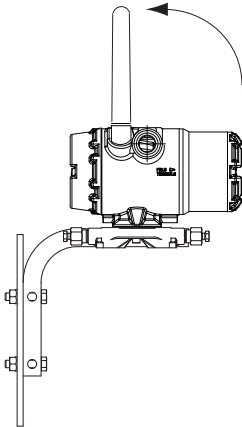
1.1 Power up sequence

The Rosemount 648 Wireless and all other wireless devices should be installed only after the Smart Wireless Gateway ("Gateway") has been installed and is functioning properly. Wireless devices should also be powered up in order of proximity from the 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 [Reference Manual](#).

1.2 Antenna position

The antenna should be positioned vertically, either straight up or straight down, and it should be approximately 3 ft. (1 m) from any large structure, building, or conductive surface to allow for clear communication to other devices.

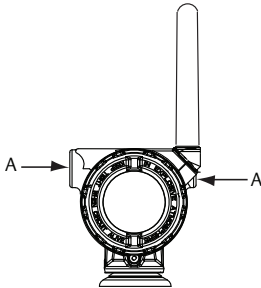
Figure 1. Antenna Position



1.3 Conduit entry

Upon installation, ensure each conduit entry is either sealed with a conduit plug using approved thread sealant, or has an installed conduit fitting or cable gland with appropriate threaded sealant.

Figure 2. Conduit Entry



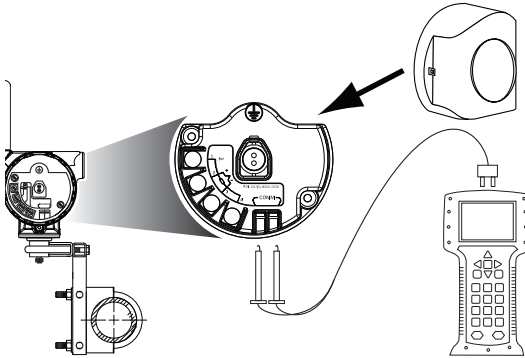
A. Conduit entry

1.4 Field Communicator connections

The black power module needs to be installed in the device for the Field Communicator to interface with the Rosemount 648 Wireless. For HART Wireless Transmitter communication via a Field Communicator, a Rosemount 648 Wireless Device Dashboard (DD) is required. Rosemount 648 Wireless Transmitters equipped with Rosemount X-well Technology requires DD revision 648 Dev. 4 Rev. 1 or higher to view Rosemount X-well functionality. To obtain the latest DD, visit the 475 Field Communicator System Software and Device Description site at:

EmersonProcess.com/Field-Communicator

Refer to [Figure 3 on page 5](#) for instructions on connecting the Field Communicator to the Rosemount 648 Wireless Transmitter.

Figure 3. Connection

2.0 Physical installation

The Rosemount 648 Wireless can be installed in one of two configurations:

- Direct Mount, where the sensor is connected directly to the Rosemount 648 Wireless housing's conduit entry.
- Remote Mount, where the sensor is mounted separate from the Rosemount 648 Wireless housing, then connected to the Rosemount 648 Wireless using conduit.

Select the installation sequence that corresponds to the mounting configuration.

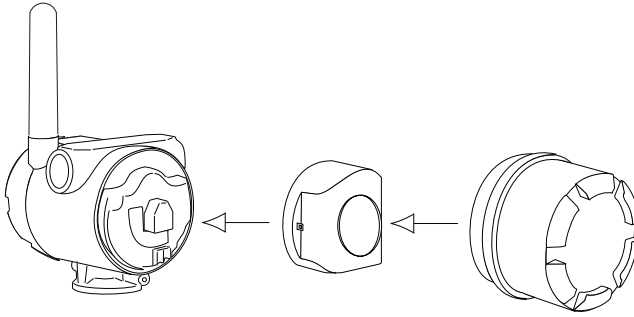
2.1 Direct mount

The direct mount installation should not be used when installing with a Swagelok® fitting.

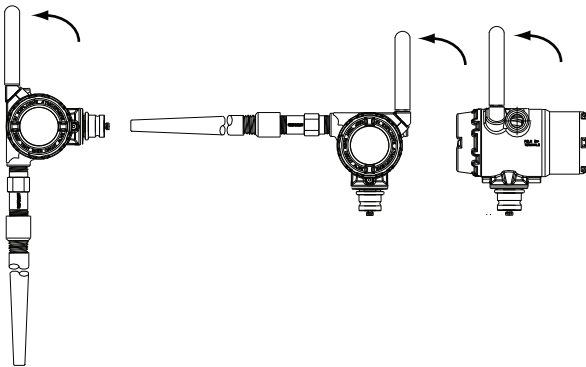
1. Install sensor according to standard installation practices using approved thread sealant on all connections.
2. Attach Rosemount 648 Wireless housing to the sensor using the threaded conduit entry.
3. Attach sensor wiring to the terminals as indicated on the wiring diagram.
4. Connect black power module.

Note

Wireless devices should be powered up in order of proximity from the Smart Wireless Gateway, beginning with the closest device to the gateway. This will result in a simpler and faster network installation.

Figure 4. Installing Electronics Housing Covers - Direct Mount


-
5. Close housing cover and tighten to safety specification. Always ensure a proper seal by installing the electronics housing covers so metal touches metal, but do not over tighten.
 6. Position antenna vertically, either straight up or straight down. The antenna should be approximately 3 ft. (1 m) from any large structures or buildings, to allow clear communication to other devices.

Figure 5. Possible Antenna Rotation - Direct Mount


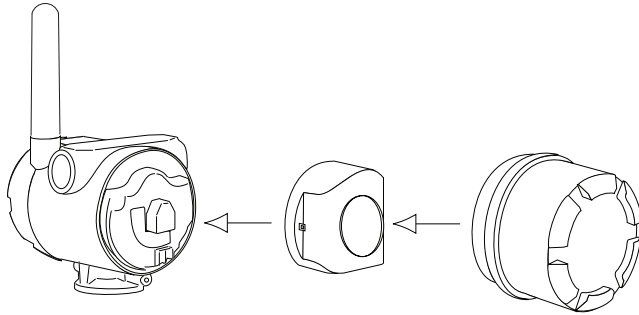
2.2 Remote mount

1. Install sensor according to standard installation practices using an approved thread sealant on all connections.
2. Run wiring (and conduit, if necessary) from the sensor to the Rosemount 648 Wireless.
3. Pull wiring through the threaded conduit entry of the Rosemount 648 Wireless.
4. Attach sensor wiring to the terminals as indicated on the wiring diagram.
5. Connect black power module.

Note

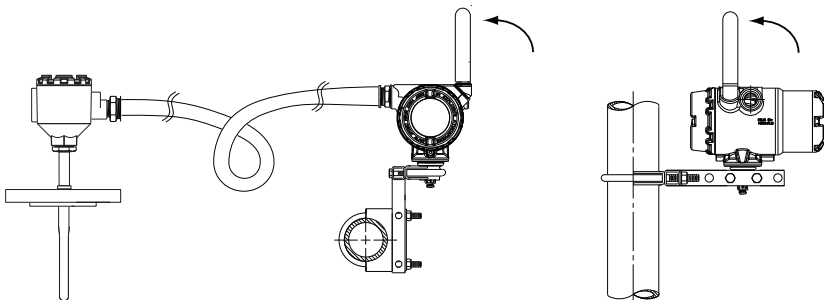
Wireless devices should be powered up in order of proximity from the wireless gateway, beginning with the closest device to the Gateway. This will result in a simpler and faster network installation.

Figure 6. Installing Electronics Housing Covers - Remote Mount



6. Close housing cover and tighten to safety specification. Always ensure a proper seal by installing the electronics housing covers so metal touches metal, but do not over tighten.
7. Position antenna vertically, either straight up or straight down. The antenna should be approximately 3 ft. (1 m) from any large structures or buildings to allow clear communication to other devices.

Figure 7. Possible Antenna Rotation - Remote Mount



2.3 Rosemount X-well Installation

Rosemount X-well Technology is only available in the Rosemount 648 Wireless and 0085 pipe clamp sensor factory assembled complete point solution. Rosemount X-well Technology will only work as specified with factory supplied and assembled pipe clamp sensor.

In general, pipe clamp sensor installation best practices shall be followed (see Rosemount 0085 Pipe Clamp Sensor [Reference Manual](#) with Rosemount X-well Technology specific requirements noted below:

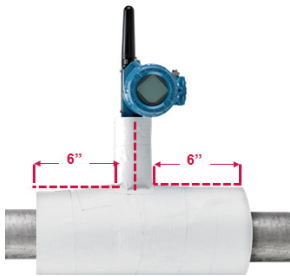
1. Direct mounting of transmitter on pipe clamp sensor is required for Rosemount X-well Technology to properly function.
2. Transmitter head shall be placed away from dynamic external temperature sources such as a boiler.
3. Insulation ($1/2$ -in. thick minimum) is required over the sensor clamp assembly and sensor extension up to transmitter head to prevent heat loss. Apply a minimum of six inches of insulation on each side of the pipe clamp sensor. Care should be taken to minimize air gaps between insulation and pipe. See [Figure 8 on page 8](#).

Note

DO NOT apply insulation over transmitter head.

4. Although it will come factory configured as such, ensure that pipe clamp RTD sensor is assembled in 3-wire configuration. See [Figure 11](#) for more information.
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Figure 8. Rosemount 648 Wireless with Rosemount X-well Technology Installation Drawing



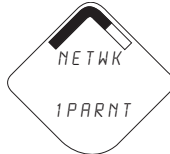



3.0 Verify operation

Operation can be verified using four methods at the device via the LCD display, using the Field Communicator, at the Gateway via the Smart Wireless Gateway's integrated web server, or using AMS™ Wireless Suite or AMS Device Manager.

3.1 LCD display

During normal operation, the LCD display will show the PV value at the confirmed update rate. Refer to the Rosemount 648 Wireless [Reference Manual](#) for error codes and other LCD display messages. Select the **Diagnostic** button to display the *TAG*, *Device ID*, *Network ID*, *Network Join Status*, and *Device Status* screens.

Searching for network	Joining network	Connected with one parent	Connected with two parents
			

3.2 Field Communicator

For HART Wireless transmitter communication via a Field Communicator, a Rosemount 648 Wireless Device Dashboard (DD) is required. Rosemount 648 Wireless transmitters equipped with Rosemount X-well Technology requires DD revision 648 Dev. 4 Rev. 1 or higher to view Rosemount X-well functionality. To obtain the latest DD, visit the 475 Field Communicator System Software and Device Description site at:

EmersonProcess.com/Field-Communicator

The communication status may be verified in the wireless device using the following Fast Key sequence.

Table 1. Rosemount 648 Wireless Fast Key Sequence

Function	Fast Key sequence	Menu items
Communications	3, 4	Comm, Join Mode, Neighbor Count, Advertisement Count, Join Attempts

3.3 Smart Wireless Gateway

If the Rosemount 648 Wireless was configured with the Network ID and Join Key and sufficient time for network polling has passed, the transmitter will be connected to the network. To verify device operation and connectivity using the Smart Wireless Gateway's web based user interface, navigate to the Devices page. This page will also display the transmitter's tag, PV, SV, TV, QV, and Last Update time. Refer to Smart Wireless Gateway User Interface [Manual Supplement](#) for terms, user fields, and parameters used in the Smart Wireless Gateway web based user interface.

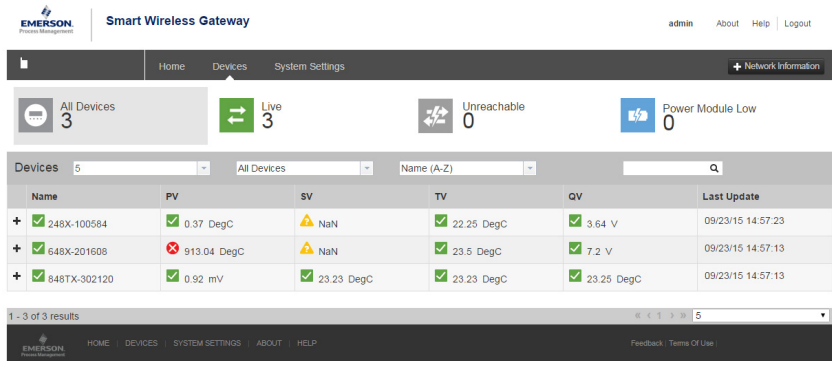
Note

The time to join the new device(s) to the network is dependent upon the number of devices being joined and the number of devices in the current network. For one device joining an existing network with multiple devices, it may take up to five minutes. It may take up to 60 minutes for multiple new devices to join the existing network.

Note

If the device joins the network and immediately has an alarm present, it is likely due to sensor configuration. Check the sensor wiring (see "Sensor Wiring" on page 12) and the sensor configuration (see Table 3 on page 14).

Figure 9. Smart Wireless Gateway Network Settings

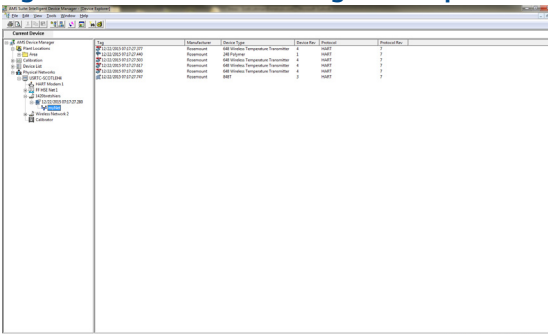


3.4 AMS Wireless Configurator

For HART Wireless transmitter communication via AMS Device Manager, a Rosemount 648 Wireless Device Dashboard (DD) is required. Rosemount 648 Wireless Transmitters equipped with Rosemount X-well Technology requires DD revision 648 Dev. 4 Rev. 1 or higher to view Rosemount X-well functionality. To obtain the latest DD, visit the Emerson™ Process Management. Easy Upgrade site at:

EmersonProcess.com/Device-Install-Kits

Figure 10. AMS Wireless Configurator Explorer Window



3.5 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 server (see [Figure 9 on page 10](#)). The network ID and join key may be changed in the wireless device by using the following Fast Key sequence.

Table 2. Wireless Configuration Fast Key Sequence

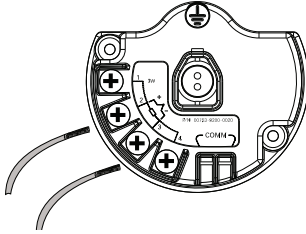
Function	Fast Key sequence	Menu items
Wireless Configuration	2, 2, 1	Network ID, Join to Network, Broadcast Info

4.0 Reference information

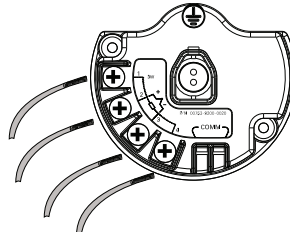
The Rosemount 648 Wireless is compatible with a number of RTD and thermocouple sensor types. [Figure 11](#) shows the correct input connections to the sensor terminals on the transmitter. [Figure 12](#), [13](#), and [14](#) shows the lead wire configurations for Rosemount sensors. To ensure proper sensor connection, anchor the sensor lead wires into the appropriate compression terminals and tighten the screws.

Figure 11. Sensor Wiring

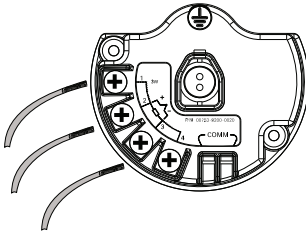
Thermocouple/mV



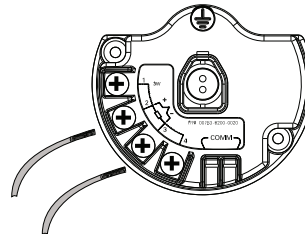
4-wire RTD and Ω



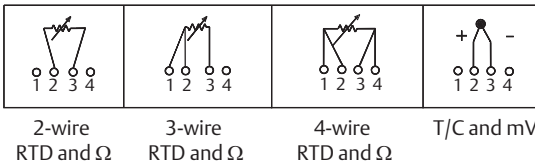
3-wire RTD and Ω



2-wire RTD and Ω



Rosemount 648 Wireless Sensor connections diagram



Emerson Process Management provides 4-wire sensors for all single element RTDs. Use these RTDs in 3-wire configurations by leaving the unneeded leads disconnected and insulated with electrical tape.

Note

In order to communicate with a Field Communicator, the device must be powered by connecting the black power module.

Figure 12. Rosemount 65, 68, 78 Series, and 58C Lead Wire Configurations

Single element

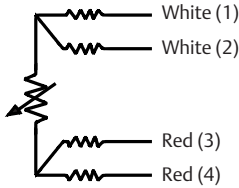
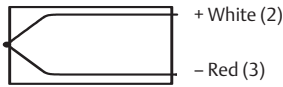
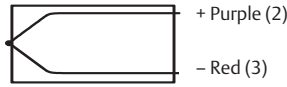


Figure 13. Rosemount 183 Series Thermocouple Lead Wire Configurations

Type J



Type E



Type K



Type T

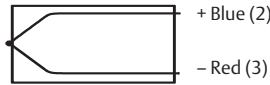
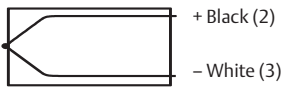
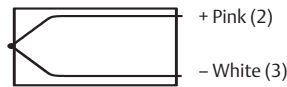


Figure 14. Series 185 Thermocouple Lead Wire Configurations

Type J



Type N



Type K



Note

The wiring diagrams shown above apply only to Rosemount sensors.

Table 3 lists the Fast Key sequences for common transmitter functions.

Table 3. Rosemount 648 Wireless Fast Key Sequence

Function	Fast Key sequence	Menu items
Device Information	2, 2, 7	Tag, Long Tag, Descriptor, Message, Date
Guided Setup	2, 1	Configure Sensor, Join to Network, Config Advance Broadcasting, Calibrate Sensor
Manual Setup	2, 2	Wireless, Sensor, Display, HART, Device Temperature, Terminal Temp, Device Information, Power, Security
Wireless Configuration	2, 2, 1	Network ID, Join to Network, Broadcast Info
Sensor Configuration	2, 2, 2, 5	Type, Connection, Units, Serial Number, Transmitter-Sensor Matching, RMT X-well Setup
Sensor Calibration	3, 5, 2	Sensor Value, Sensor Status, Current Lower Trim, Current Upper Trim, RTD 2 Wire Offset, Lower Sensor Trim, Upper Sensor Trim, Device variable trim reset

5.0 Power module replacement

Expected black power module life is 10 years at reference conditions.⁽¹⁾

When module replacement is required perform the following procedure.

1. Remove the cover and module.
2. Replace the module (part number 701PBKKE) and cover.
3. Tighten to specification and verify operation.

5.1 Handling considerations

The black power module with the wireless unit contains two “C” size primary lithium-thionyl chloride battery (black power module, model number 701PBKKE). Each battery contains approximately 5.0 grams of lithium. Under normal conditions, the battery materials are self-contained and are not reactive as long as the batteries and the pack integrity are maintained. Care should be taken to prevent thermal, electrical or mechanical damage.

Contacts should be protected to prevent premature discharge.

Black power modules should be stored in a clean and dry area. For maximum black power module life, storage temperature should not exceed 86 °F (30 °C).

Note

Continuous exposure to ambient temperature limits of -40 °F or 185 °F (-40 °C or 85 °C) may reduce specified life by less than 20 percent.

1. Reference conditions are 70 °F (21° C), transmit rate of once per minute, and routing data for three additional network devices.

Use caution when handling the black power module, it may be damaged if dropped from heights in excess of 20 feet.



Battery hazards remain when cells are discharged.

5.2 Environmental considerations

As with any battery, local environmental rules and regulations should be consulted for proper management of spent batteries. If no specific requirements exist, recycling through a qualified re-cycler is encouraged. Consult the materials safety data sheet for battery specific information.

5.3 Shipping considerations

The unit was shipped to you without the black power module installed. Remove the module prior to shipping the unit.

6.0 Product Certifications

Rev 3.1

6.1 European Directive Information

A copy of the EU Declaration of Conformity can be found at the end of the Quick Start Guide. The most recent revision of the EU Declaration of Conformity can be found at EmersonProcess.com/Rosemount.

6.2 Telecommunication Compliance

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

Emerson Process Management 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.

6.3 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.

6.4 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).

6.5 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

15 U.S. Intrinsic Safety (IS), Nonincendive (NI), and Dust Ignition-proof (DIP)

Certificate: FM 3027705

Standards: FM Class 3600 — 2011, FM Class 3610 — 2010, FM Class 3611 — 2004, FM Class 3810 — 2005, ANSI/NEMA® 250 — 2003, ANSI/ISA-60079-0 — 2009, ANSI/ISA-60079-11 — 2009

Markings: IS CL I, DIV 1, GP 1, A, B, C, D; CL II, DIV 1, GP E, F, G; Class III, T4/T5; Class 1, Zone 0 AEx ia IIC T4/T5; T4(-50 °C ≤ T_a ≤ +70 °C), T5(-50 °C ≤ T_a ≤ +40 °C) when installed per Rosemount drawing 00648-1000; NI CL I, DIV 2, GP A, B, C, D T4/T5; T4(-50 °C ≤ T_a ≤ +70 °C), T5(-50 °C ≤ T_a ≤ +40 °C) when installed per Rosemount drawing 00648-1000; DIP CL II, DIV 1, GP E, F, G; CL III, T5; T5(-50 °C ≤ T_a ≤ +85 °C); Type 4X; IP66

Special Conditions for Safe Use (X):

1. The Rosemount 648 Transmitter housing contains aluminum and is considered a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact and friction.
2. The surface resistivity of the antenna is greater than 1 GΩ. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or dry cloth.
3. The Rosemount 648 Wireless Transmitter shall only be used with the 701PBKKF Rosemount SmartPower™ Battery Pack (P/N 00753-9220-0001).

Sensor terminal parameters
$U_o = 6.6 \text{ V}$
$I_o = 26.2 \text{ mA}$
$P_o = 42.6 \text{ mW}$
$C_o = 23.8 \text{ }\mu\text{F}$
$L_o = 50 \text{ mH}$

N5 U.S. Nonincendive (NI) and Dust Ignition-proof (DIP)

Certificate: FM 3027705

Standards: FM Class 3600 — 2011, FM Class 3611 — 2004, FM Class 3810 — 2005, ANSI/NEMA 250 — 2003

Markings: NI CL I, DIV 2, GP A, B, C, D T4/T5; T4(−50 °C ≤ T_a ≤ +70 °C), T5(−50 °C ≤ T_a ≤ +40 °C); DIP CL II, DIV 1, GP E, F, G; CL III, T5; T5(−50 °C ≤ T_a ≤ +85 °C); Type 4X; IP66/67

Special Condition for Safe Use (X):

1. For use only with the Model 701PBKKF or Rosemount P/N 753-9220-0001 Smart Power Battery Module.

Canada

I6 Canada Intrinsically Safe

Certificate: CSA 1143113

Standards: CAN/CSA C22.2 No. 0-10, 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 Class I, Division 1, Groups A, B, C and D T3C; Class 1, Zone 0, IIC, T3C; when connected per Rosemount drawing 00648-1020; Type 4X


Sensor terminal parameters
$U_o = 6.6 \text{ V}$
$I_o = 26.2 \text{ mA}$
$P_o = 42.6 \text{ mW}$
$C_o = 23.8 \text{ }\mu\text{F}$
$L_o = 50 \text{ mH}$


Europe

11 ATEX Intrinsic Safety

Certificate: Baseefa07ATEX0011X

Standards: EN 60079-0: 2012 + A11:2013, EN 60079-11: 2012

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

 II 1 G Ex ia IIC T5 Ga, T5(-60 °C ≤ T_a ≤ +40 °C)

For use with Rosemount SmartPower power module part number 753-9220-0001, or for use with Emerson SmartPower option 701PBKFF.

Sensor terminal parameters
U _o = 6.6 V
I _o = 26.2 mA
P _o = 42.6 mW
C _o = 11 μF
L _o = 25 mH


Special Conditions for Safe Use (X):

1. The surface resistivity of the antenna is greater than 1 GΩ. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or dry cloth.
2. The power module may be replaced in a hazardous area. The power module has a surface resistivity greater than 1 GΩ 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.

NM ATEX Intrinsic Safety for Mining

Certificate: Baseefa07ATEX0011X

Standards: EN 60079-0: 2012 +A11:2013, EN 60079-11: 2012

Markings:  I M 1 Ex ia I Ma (-60 °C ≤ T_a ≤ +70 °C)

Sensor terminal parameters
U _o = 6.6 V
I _o = 26.2 mA
P _o = 42.6 mW
C _o = 11 μF
L _o = 25 mH

Special Conditions for Safe Use (X):

1. The surface resistivity of the antenna is greater than 1 GΩ. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or dry cloth.
2. The power module may be replaced in a hazardous area. The power module has a surface resistivity greater than 1 GΩ 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

17 IECEx Intrinsic Safety

Certificate: IECEx BAS 07.0007X

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

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

Ex ia IIC T5 Ga, T5 (-60 °C ≤ T_a ≤ +40 °C)

Sensor terminal parameters
$U_o = 6.6 \text{ V}$
$I_o = 26.2 \text{ mA}$
$P_o = 42.6 \text{ mW}$
$C_o = 11 \text{ }\mu\text{F}$
$L_o = 25 \text{ mH}$

Special Conditions for Safe Use (X):

1. The surface resistivity of the antenna is greater than 1 GΩ. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or dry cloth.
2. The Model 701PBKKF Power Module may be replaced in a hazardous area. The Power Modules have a surface resistivity greater than 1 GΩ 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.
3. The Rosemount 648 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.

Brazil

I2 INMETRO Intrinsic Safety

Certificate: UL-BR 15.0140X

Standards: ABNT NBR IEC 60079-0:2008 + Errata 1:2011, ABNT NBR IEC60079-11:2009

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

Ex ia IIC T5 ($-60 \text{ }^\circ\text{C} \leq T_a \leq +40 \text{ }^\circ\text{C}$); IP66

Sensor terminal parameters
$U_o = 6.6 \text{ V}$
$I_o = 26.2 \text{ mA}$
$P_o = 42.6 \text{ mW}$
$C_o = 11 \text{ }\mu\text{F}$
$L_o = 25 \text{ mH}$

Special Condition for Safe Use (X):

1. See certificate for special conditions.

China

I3 China Intrinsic Safety

Certificate: GYJ11.1706X

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

Markings: Ex ia IIC T4/T5 Ga

T code	Ambient temperature
T4	$-60 \text{ }^\circ\text{C} \leq T_a \leq +70 \text{ }^\circ\text{C}$
T5	$-60 \text{ }^\circ\text{C} \leq T_a \leq +45 \text{ }^\circ\text{C}$

Sensor terminal parameters
$U_o = 6.6 \text{ V}$
$I_o = 26.2 \text{ mA}$
$P_o = 42.6 \text{ mW}$
$C_o = 11 \text{ } \mu\text{F}$
$L_o = 25 \text{ } \mu\text{H}$

Special Condition for Safe Use (X):

1. See certificate for special conditions.

Japan**I4** TIIS Intrinsic Safety

Certificate: TC18638

Markings: Ex ia IIC T4 (-20 ~ +60 °C)

Sensor terminal parameters
$U_o = 6.6 \text{ V}$
$I_o = 26.2 \text{ mA}$
$P_o = 42.6 \text{ mW}$
$C_o = 10.9 \text{ } \mu\text{F}$
$L_o = 25 \text{ } \mu\text{H}$

Special Condition for Safe Use (X):

1. See certificate for special conditions.

EAC – Belarus, Kazakhstan, Russia**IM** Technical Regulation Customs Union Intrinsic Safety

Certificate: RU C-US.Gb05.B.00289

Markings: 0Ex ia IIC T4/T5 X,

T4 (-60 °C ≤ T_a ≤ +70 °C)T5 (-60 °C ≤ T_a ≤ +40 °C)

Sensor terminal parameters
$U_o = 6.6 \text{ V}$
$I_o = 26.2 \text{ mA}$
$P_o = 42.6 \text{ mW}$
$C_a = 11 \text{ } \mu\text{F}$
$L_a = 25 \text{ } \mu\text{H}$

Special Condition for Safe Use (X):

1. See certificate for special conditions.

Republic of Korea

- IP** Republic of Korea Intrinsic Safety
 Certificate: 11-KB4BO-0071
 Markings: Ex ia IIC T4/T5
 T4 (-60 °C ~ +70 °C)
 T5 (-60 °C ~ +40 °C)

Sensor terminal parameters
$U_o = 6.6 \text{ V}$
$I_o = 26.2 \text{ mA}$
$P_o = 42.6 \text{ mW}$
$C_o = 10.9 \mu\text{F}$
$L_o = 25 \mu\text{H}$



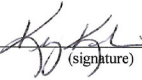
Special Condition for Safe Use (X):

1. See certificate for special conditions.

Combinations

- KQ** Combination of I1, I5, and I6

Figure 15. Rosemount 648 Wireless Declaration of Conformity

	EU Declaration of Conformity No: RMD 1065 Rev. H	
<p>We,</p> <p>Rosemount, Inc. 8200 Market Boulevard Chanhassen, MN 55317-9685 USA</p> <p>declare under our sole responsibility that the product,</p> <p>Rosemount 648 Wireless Temperature Transmitter</p> <p>manufactured by,</p> <p>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>		
 _____ (signature)		Vice President of Global Quality _____ (function name - printed)
Kelly Klein _____ (name - printed)		19 Apr 2016 _____ (date of issue)
Page1 of 3		



EU Declaration of Conformity



No: RMD 1065 Rev. H

EMC Directive (2004/108/EC) *This directive is valid until 19 April 2016*

EMC Directive (2014/30/EU) *This directive is valid from 20 April 2016*

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

R&TTE Directive (1999/5/EC)

Harmonized Standards:
EN 300 328 V1.9.1
EN 301 489-17: V2.2.1
EN 61010-1: 2010
EN 64279: 2010

ATEX Directive (94/9/EC) *This directive is valid until 19 April 2016*

ATEX Directive (2014/34/EU) *This directive is valid from 20 April 2016*

Baseefa07ATEX0011X – Intrinsic Safety Certificate

Equipment Group II, Category 1 G

Ex ia IIC T4/T5 Ga

Equipment Group I, Category 1 M

Ex ia I Ma

Harmonized Standards:
EN 60079-0: 2012/A11: 2013
EN 60079-11: 2012



EU Declaration of Conformity

No: RMD 1065 Rev. H



ATEX Notified Body

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

ATEX Notified Body for Quality Assurance

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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 648
List of Rosemount 648 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 diphenyls (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	O	O	O	X	O	O
传感器组件 Sensor Assembly	X	O	O	O	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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