

Rosemount™ 644 Temperature Transmitter

with 4–20 mA HART® Protocol (Revision 5 and 7)



Note

Before installing the transmitter, confirm the correct device driver is loaded on the host systems. See [page 3](#) for system readiness.

NOTICE

This guide provides basic guidelines for Rosemount 644 Transmitters. It does not provide instructions for configuration, diagnostics, maintenance, service, troubleshooting, explosionproof, flameproof, or intrinsically safe (I.S.) installations. Refer to the Rosemount 644 [Reference Manual](#) for more instruction. The manual and this guide is also available electronically on Emerson.com/Rosemount.

⚠ WARNING**Explosions could result in death or serious injury.**

Installation of this transmitter in an explosive environment must be in accordance with the appropriate local, national, and international standards, codes, and practices. Review the approvals section of the Rosemount 644 [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.

Electrical shock can result in death or serious injury.

- Avoid contact with the leads and the terminals. High voltage may be present on leads, which can cause electrical shock.

Conduit/cable entries

- Unless marked, the conduit/cable entries in the transmitter housing use a $\frac{1}{2}$ -14 NPT thread form. Entries marked "M20" are M20 \times 1.5 thread form. On devices with multiple conduit entries, all entries will have the same thread form. Only use plugs, adapters, glands, or conduit with a compatible thread form when closing these entries.
- When installing in a hazardous location, use only appropriately listed or Ex certified plugs, adapters, or glands in cable/conduit entries.

Contents

System readiness	3	Safety instrumented systems	17
Transmitter installation	3	Product Certifications	18

1.0 System readiness

1.1 Confirm HART Revision capability

- If using HART based control or asset management systems, confirm the HART capability of those systems prior to transmitter installation. Not all systems are capable of communicating with HART Revision 7 Protocol. This transmitter can be configured for either HART Revision 5 or 7.
- For instructions on how to change the HART Revision of your transmitter, see “Verify configuration” on page 4.

1.2 Confirm correct device driver

1. Verify the latest Device Driver files are loaded on your systems to ensure proper communications.
2. Download the latest Device Driver at Emerson.com/Device-Install-Kits/Device-Install-Kit-Search

Rosemount 644 Transmitter device revisions and files

Table 1 provides the information necessary to ensure the correct Device Driver files and documentation are being used.

Table 1. Rosemount 644 Device Revisions and Files

Software date	NAMUR software revision	HART software revision	HART universal revision ⁽¹⁾	Device revision ⁽²⁾	Manual document number	Changes to software ⁽³⁾
June 2012	1.1.1	3	5	8	00809-0100-4728	See Footnote 3 for list of changes.
			7	9		

1. NAMUR software revision is located on the hardware tag of the device. HART software revision can be read using a HART communication tool.
2. Device Driver file names use Device and DD Revision, e.g. 10_01. HART Protocol is designed to enable legacy device driver revisions to continue to communicate with new HART devices. To access new functionality, the new Device Driver must be downloaded. It is recommended to download new Device Driver files to ensure full functionality.
3. HART Revision 5 and 7 Selectable, Dual Sensor support, Safety Certified, Advanced Diagnostics (if ordered), Enhanced Accuracy and Stability (if ordered).

2.0 Transmitter installation

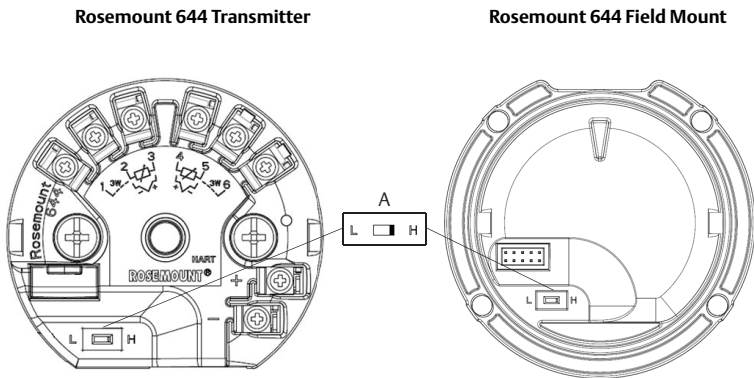
2.1 Set the alarm switch

Set the Rosemount 644 Transmitter alarm switch before putting the device into operation.

1. Set the loop to manual (if applicable) and disconnect the power
2. Remove the LCD display by detaching from the transmitter (if applicable).
3. Set the switch to the desired position (*H* indicates High, *L* indicated Low).
4. Reattach the LCD display to the transmitter (if applicable).
5. Reattach the housing cover. Ensure covers must be fully engaged to meet explosion-proof requirements.

6. Apply power and set the loop to automatic control (if applicable).

Figure 1. Alarm Switch Placement



A. Alarm switch

Note

If using an LCD display, remove the display by detaching it from the top of the device, set the switch to the desired position, reattach the LCD display, and reattach the housing cover. Enclosure covers must be fully engaged to meet explosion-proof requirements.

2.2 Verify configuration

Verify the configuration of the Rosemount 644 Transmitter device upon receiving your transmitter using any HART-compliant configuration tool. See the Rosemount 644 [Reference Manual](#) for configuration instructions using AMS Device Manager.

The Rosemount 644 Transmitter communicates using the Field Communicator (communication requires a loop resistance between 250 and 1100 ohms). Do not operate when power is below 12 Vdc at the transmitter terminal. See Rosemount 644 [Reference Manual](#) and Field Communicator [Reference Manual](#) for more information.

Verify configuration with a Field Communicator

A Rosemount 644 DD (Device Descriptor) must be installed on the Field Communicator to verify the configuration. Fast Key sequences for the latest DD are shown in [Table 2 on page 5](#). For Fast Key sequences using legacy DD's, contact your local Emerson™ representative.

Perform the following steps to determine if an upgrade is required.

1. Connect the sensor (see the wiring diagram located on the device's top label).

2. Connect the bench power supply to the power terminals (“+” or “-”).
3. Connect a Field Communicator to the loop across a loop resistor or at the power/signal terminals on the transmitter.
4. The following message will appear if the communicator has a previous version of the DDs:

Device Description Not Installed...The Device Description for manufacturer 0x26 model 0x2618 dev rev 8/9 is not installed on the System Card...see Programming Utility for details on Device Description updates...Do you wish to proceed in forward compatibility mode?

If this notice does not appear, the latest DD is installed. If the latest version is not available, the communicator will communicate properly, however, when the transmitter is configured to utilize advanced transmitter features, there will be trouble communicating and a prompt to turn off the communicator will display. To prevent this from happening, upgrade to the latest DD or answer NO to the question and default to the generic transmitter functionality.

Note

Emerson recommends installing the latest DD to access the complete functionality. Visit Emerson.com/Field-Communicator for information on updating the DD Library.

Field Communicator user interface

Two user interfaces are available to configure this device.

The [Device Revision 8 and 9 \(HART 5 and 7\)](#), [DD Revision 1 Fast Key Sequence](#) in [Table 2](#) may be used for transmitter configuration and startup.

Figure 2. Device Dashboard Field Communicator Interface

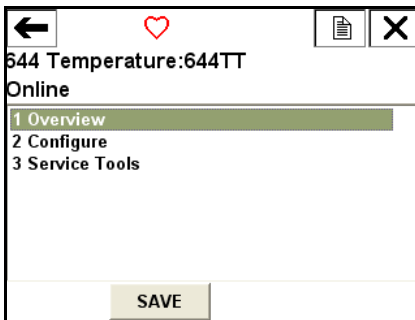


Table 2. Device Revision 8 and 9 (HART 5 and 7), DD Revision 1 Fast Key Sequence

Function	HART 5	HART 7
Alarm Values	2, 2, 5, 6	2, 2, 5, 6
Analog Calibration	3, 4, 5	3, 4, 5
Analog Output	2, 2, 5, 1	2, 2, 5, 1

Table 2. Device Revision 8 and 9 (HART 5 and 7), DD Revision 1 Fast Key Sequence

Function	HART 5	HART 7
Average Temperature Setup	2, 2, 3, 3	2, 2, 3, 3
Burst Mode	2, 2, 8, 4	2, 2, 8, 4
Comm Status	N/A	1, 2
Configure additional messages	N/A	2, 2, 8, 4, 7
Configure Hot Backup™	2, 2, 4, 1, 3	2, 2, 4, 1, 3
D/A Trim	3, 4, 4, 1	3, 4, 4, 1
Damping Values	2, 2, 1, 5	2, 2, 1, 6
Date	2, 2, 7, 1, 2	2, 2, 7, 1, 3
Display Setup	2, 1, 4	2, 1, 4
Descriptor	2, 2, 7, 1, 4	2, 2, 7, 1, 5
Device Information	1, 8, 1	1, 8, 1
Differential Temperature Setup	2, 2, 3, 1	2, 2, 3, 1
Drift Alert	2, 2, 4, 2	2, 2, 4, 2
Filter 50/60 Hz	2, 2, 7, 4, 1	2, 2, 7, 4, 1
First Good Temperature Setup	2, 2, 3, 2	2, 2, 3, 2
Hardware Revision	1, 8, 2, 3	1, 8, 2, 3
HART Lock	N/A	2, 2, 9, 2
Intermittent Sensor Detect	2, 2, 7, 4, 2	2, 2, 7, 4, 2
Loop Test	3, 5, 1	3, 5, 1
Locate Device	N/A	3, 4, 6, 2
Lock Status	N/A	1, 8, 3, 8
LRV (Lower Range Value)	2, 2, 5, 5, 3	2, 2, 5, 5, 3
LSL (Lower Sensor Limit)	2, 2, 1, 7, 2	2, 2, 1, 8, 2
Message	2, 2, 7, 1, 3	2, 2, 7, 1, 4
Open Sensor Holdoff	2, 2, 7, 3	2, 2, 7, 3
Percent Range	2, 2, 5, 2	2, 2, 5, 2
Sensor 1 Configuration	2, 1, 1	2, 1, 1
Sensor 2 Configuration	2, 1, 1	2, 1, 1
Sensor 1 Serial Number	2, 2, 1, 6	2, 2, 1, 7
Sensor 2 Serial Number	2, 2, 2, 7	2, 2, 2, 8
Sensor 1 Type	2, 2, 1, 2	2, 2, 1, 3
Sensor 2 Type	2, 2, 2, 2	2, 2, 2, 3
Sensor 1 Unit	2, 2, 1, 4	2, 2, 1, 5
Sensor 2 Unit	2, 2, 2, 4	2, 2, 2, 5
Sensor 1 Status	N/A	2, 2, 1, 2
Sensor 2 Status	N/A	2, 2, 2, 2

Table 2. Device Revision 8 and 9 (HART 5 and 7), DD Revision 1 Fast Key Sequence

Function	HART 5	HART 7
Simulate Digital Signal	N/A	3, 5, 2
Software Revision	1, 8, 2, 4	1, 8, 2, 4
Tag	2, 2, 7, 1, 1	2, 2, 7, 1, 1
Long Tag	N/A	2, 2, 7, 1, 2
Terminal Temperature	2, 2, 7, 1	2, 2, 8, 1
URV (Upper Range Value)	2, 2, 5, 5, 2	2, 2, 5, 5, 2
USL (Upper Sensor Limit)	2, 2, 1, 7, 2	2, 2, 1, 8, 2
Variable Mapping	2, 2, 8, 5	2, 2, 8, 5
2-wire Offset Sensor 1	2, 2, 1, 9	2, 2, 1, 10
2-wire Offset Sensor 2	2, 2, 2, 9	2, 2, 2, 10

Input or verify Callendar Van-Dusen constants

If sensor matching is being used with this combination of a transmitter and sensor, verify the constants input.

1. From the *HOME* screen, select **2 Configure, 2 Manual Setup, 1 Sensor**.
2. Set the control loop to manual and select **OK**.
3. At the *ENTER SENSOR TYPE* prompt, select **Cal VanDusen**.
4. At the *ENTER SENSOR CONNECTION* prompt, select the appropriate number of wires.
5. Enter the Ro, Alpha, Delta, and Beta values from the stainless steel tag attached to the special-order sensor when prompted.
6. Return the control loop to automatic control and select **OK**.
7. To disable the transmitter-sensor matching feature from the *HOME* screen select **2 Configure, 2 Manual Setup, 1 Sensor, 10 Sensor Matching-CVD**.
8. Choose the appropriate sensor type from the *ENTER SENSOR TYPE* prompt.

Verifying configuration with Local Operator Interface (LOI)

The optional LOI can be used for commissioning the device. The LOI is a two-button design. To activate the LOI, push any button. LOI button functionality is shown on the bottom corners of the display. See [Table 3](#) and [Figure 4](#) for button operation and menu information.

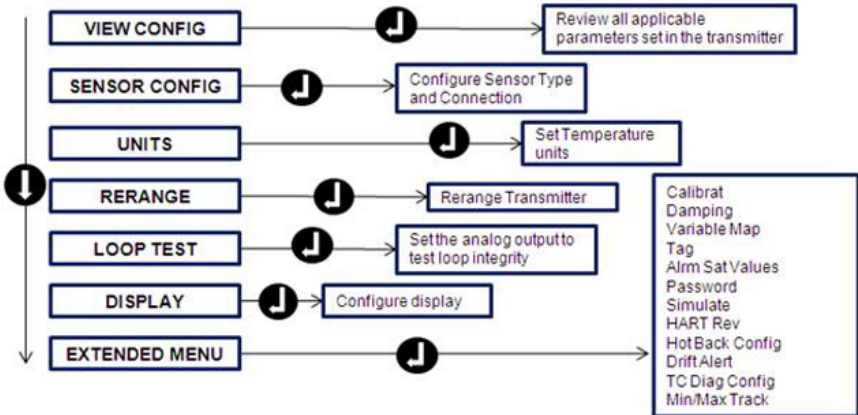
Figure 3. Local Operator Interface



Table 3. LOI Button Operation

Button	Left	Right
Left	No	SCROLL
Right	Yes	ENTER

Figure 4. LOI Menu



Switch HART Revision mode

Not all systems are capable of communicating with HART Revision 7 Protocol. This transmitter can be configured for either HART Revision 5 or 7 using a HART capable configuration tool.

Updated configuration menus include a HART Universal Revision parameter that can be configured to 5 or 7 if accessible by your system. See [Table 2](#) for the Fast Key sequence.

If the HART configuration tool is not capable of communicating with HART Revision 7, the configuration menus in [Table 2](#) will not be available. To switch the HART Universal Revision parameter from generic mode, follow the instructions below.

1. Go to *Configure>Manual Setup>Device Information>Identification>Message*.
 - a. To change your device to HART Revision 7, Enter: “**HART7**” in the Message field.
 - b. To change your device to HART Revision 5, Enter: “**HART5**” in the Message field.

Note

See [Table 2 on page 5](#) to change HART Revision when the correct Device Driver is loaded.

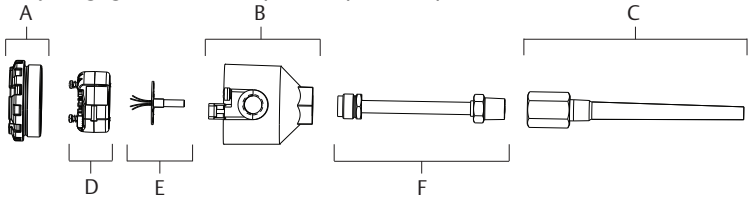
2.3 Mount the transmitter

Mount the transmitter at a high point in the conduit run to prevent moisture from draining into the transmitter housing.

Head mount transmitter with DIN plate style sensor installation

1. Attach the thermowell to the pipe or process container wall.
2. Install and tighten the thermowell before applying process pressure.
3. Verify the transmitter failure mode switch position.
4. Assemble the transmitter to the sensor. Push the transmitter mounting screws through the sensor mounting plate.
5. Wire the sensor to the transmitter (see “[Wire and apply power](#)” on page 12).
6. Insert the transmitter-sensor assembly into the connection head.
 - a. Thread the transmitter mounting screw into the connection head mounting holes.
 - b. Assemble the extension to the connection head.
 - c. Insert the assembly into the thermowell.
7. If using a cable gland, properly attach the cable gland to a housing conduit entry.
8. Insert the shielded cable leads into the connection head through the cable entry.
9. Connect the shielded power cable leads to the transmitter power terminals. Avoid contact with sensor leads and sensor connections.
10. Connect and tighten the cable gland.

11. Install and tighten the connection head cover. Enclosure covers must be fully engaged to meet explosion-proof requirements.



- A. Connection head cover
 B. Connection head
 C. Thermowell
 D. Transmitter mounting screws
 E. Integral mount sensor with flying leads
 F. Extension

Head mount transmitter with threaded sensor installation (two or three conduit entries)

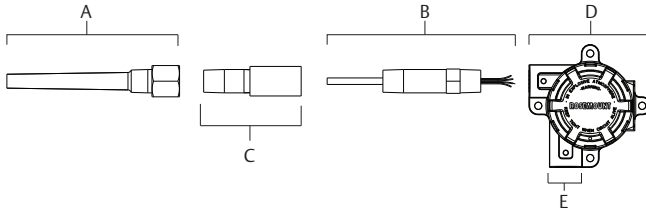
1. Attach the thermowell to the pipe or process container wall.
2. Install and tighten thermowells before applying process pressure.
3. Attach necessary extension nipples and adapters to the thermowell.
4. Seal the nipple and adapter threads with silicone tape.
5. Screw the sensor into the thermowell. Install drain seals if required for severe environments or to satisfy code requirements.
6. Verify the transmitter failure mode switch is in the desired position.
7. To verify the correct installation of Integral Transient Protection (option code T1) on the Rosemount 644 Transmitter, confirm the following steps have been completed:
 - a. Ensure the transient protector unit is firmly connected to the transmitter puck assembly.
 - b. Ensure the transient protector power leads are adequately secured under the transmitter power terminal screws.
 - c. Verify the transient protector's ground wire is secured to the internal ground screw found within the universal head.

Note

The transient protector requires the use of an enclosure of at least 3.5-in. (89 mm) in diameter.

8. Pull the sensor wiring leads through the universal head and transmitter center hole.
9. Mount the transmitter in the universal head by threading the transmitter mounting screws into the universal head mounting holes.
10. Mount the transmitter-sensor assembly into the thermowell, or remote mount if desired.
11. Seal adapter threads with silicone tape.
12. Pull the field wiring leads through the conduit into the universal head. Attach the sensor and power leads to the transmitter. Avoid contact with other terminals.

13. Install and tighten the universal head cover. Enclosure covers must be fully engaged to meet explosion-proof requirements.

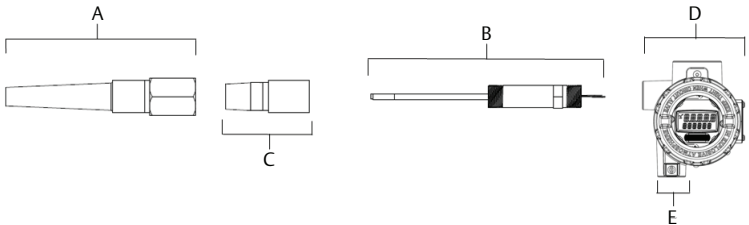


A. Threaded thermowell
B. Threaded style sensor
C. Standard extension

D. Universal head (transmitter inside)
E. Conduit entry

Field mount transmitter with threaded sensor installation

1. Attach the thermowell to the pipe or process container wall. Install and tighten thermowells before applying process pressure.
2. Attach necessary extension nipples and adapters to the thermowell.
3. Seal the nipple and adapter threads with silicone tape.
4. Screw the sensor into the thermowell. Install drain seals if required for severe environments or to satisfy code requirements.
5. Verify the transmitter failure mode switch is in the desired position.
6. Mount the transmitter-sensor assembly into the thermowell, or remote mount if desired.
7. Seal adapter threads with silicone tape.
8. Pull the field wiring leads through the conduit into the field mount housing. Wire the sensor and power leads to the transmitter. Avoid contact with other terminals.
9. Install and tighten the covers of two compartments. Enclosure covers must be fully engaged to meet explosion-proof requirements.



A. Threaded thermowell
B. Threaded style sensor
C. Standard extension

D. Field mount housing (transmitter inside)
E. Conduit entry

2.4 Wire and apply power

Wire the sensor to the transmitter

The wiring diagram is located on the device's top label below the terminal screws.

Figure 5. Rosemount 644 Head Mount Transmitter

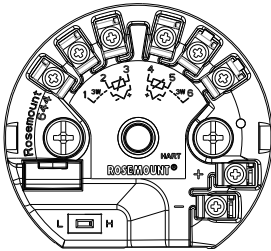
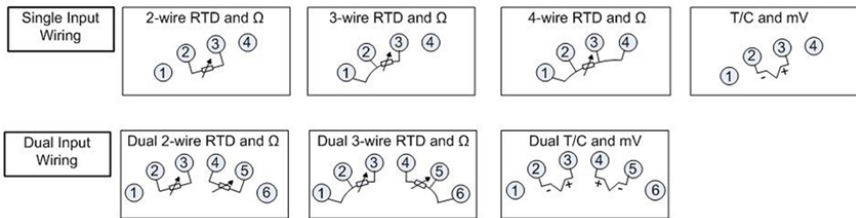


Figure 6. Rosemount 644 Head Mount - Single and Dual Input Wiring Diagrams



* The transmitter must be configured for at least a three-wire RTD in order to recognize an RTD with a compensation loop.

** Emerson provides a four-wire sensors for all single element RTDs. Use these RTDs in three-wire configurations by leaving the unneeded leads disconnected and insulated with electrical tape.

Figure 7. Rosemount 644 Field Mount Transmitter

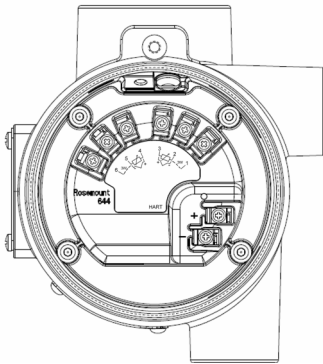
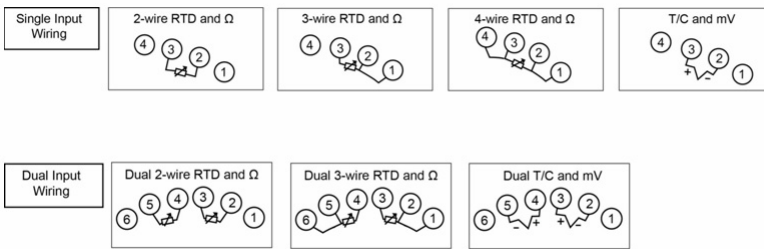


Figure 8. Rosemount 644 Field Mount - Single and Dual Input Wiring Diagrams



Power the transmitter

An external power supply is required to operate the transmitter.

1. Remove the housing cover (if applicable).
2. Connect the positive power lead to the “+” terminal. Connect the negative power lead to the “-” terminal.
 - If a transient protector is being used, the power leads will now be connected to the top of the transient protector unit. See the transient label for indication of “+” and “-” terminal connections.
3. Tighten the terminal screws. When tightening the sensor and power wires, the max torque is 6 in-lb (0.7 N-m).
4. Reattach and tighten the cover (if applicable). Enclosure covers must be fully engaged to meet explosion-proof requirements.
5. Apply power (12–42 Vdc).

Load limitation

The power required across the transmitter power terminals is 12 to 42.4 Vdc (the power terminals are rated to 42.4 Vdc). To prevent damaging the transmitter, do not allow terminal voltage to drop below 12.0 Vdc when changing the configuration parameters.

Ground the transmitter

To ensure proper grounding, it is important the instrument cable shield be:

- trimmed close and insulated from touching the transmitter housing
- connected to the next shield if cable is routed through a junction box
- connected to a good earth ground at the power supply end

Note

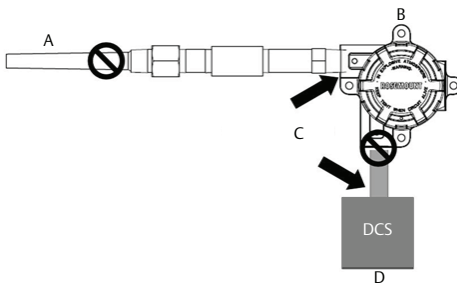
Shielded twisted pair cable should be used for best results. Use 24 AWG or larger wire and do not exceed 5,000 ft. (1500 m).

Ungrounded thermocouple, mV, and RTD/Ohm inputs

Each process installation has different requirements for grounding. Use the grounding options recommended by the facility for the specific sensor type, or begin with grounding Option 1 (the most common).

Option 1

1. Connect sensor wiring shield to the transmitter housing.
2. Ensure the sensor shield is electrically isolated from surrounding fixtures that may be grounded.
3. Ground signal wiring shield at the power supply end.



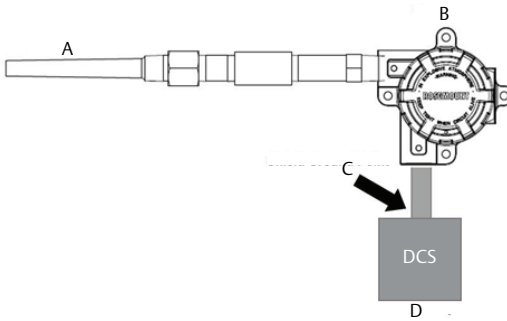
A. Sensor wires
B. Transmitter

C. Shield ground point
D. 4–20 mA loop

Option 2

1. Connect signal wiring shield to the sensor wiring shield.
2. Ensure the two shields are tied together and electrically isolated from the transmitter housing.
3. Ground shield at the power supply end only.

4. Ensure the sensor shield is electrically isolated from the surrounding grounded fixtures.



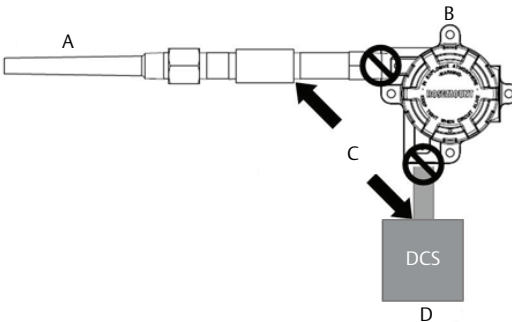
A. Sensor wires
B. Transmitter

C. Shield ground point
D. 4–20 mA loop

5. Connect shields together, electrically isolated from the transmitter.

Option 3

1. Ground sensor wiring shield at the sensor, if possible.
2. Ensure the sensor wiring and signal wiring shields are electrically isolated from the transmitter housing.
3. Do not connect the signal wiring shield to the sensor wiring shield.
4. Ground signal wiring shield at the power supply end.



A. Sensor wires
B. Transmitter

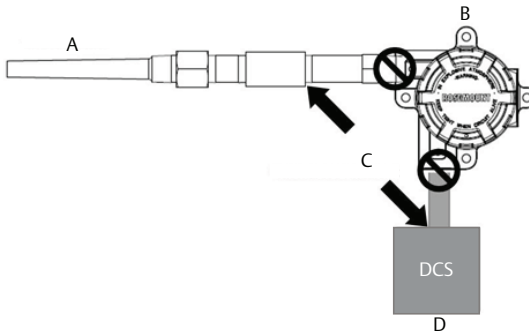
C. Shield ground point
D. 4–20 mA loop

Grounded thermocouple inputs

Option 1

1. Ground sensor wiring shield at the sensor.
2. Ensure the sensor wiring and signal wiring shields are electrically isolated from the transmitter housing.
3. Do not connect the signal wiring shield to the sensor wiring shield.

4. Ground signal wiring shield at the power supply end.



A. Sensor wires
B. Transmitter

C. Shield ground point
D. 4–20 mA loop

2.5 Perform a loop test

The Loop Test command verifies transmitter output, loop integrity, and operation of any recorders or similar devices installed in the loop.

Performing a loop test using a Field Communicator

1. Connect an external ampere meter in series with the transmitter loop (so the power to the transmitter goes through the meter at some point in the loop).
2. From the home screen, enter the Fast Key sequence.

Device dashboard Fast Keys	3, 5, 1
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3. In the test loop, verify the transmitter's actual mA output and the HART mA reading are the same value. If the readings do not match, either the transmitter requires an output trim or the meter is malfunctioning. After completing the test, the display returns to the loop test screen and allows the user to choose another output value.
4. To end the loop test, select **End** and **Enter**.

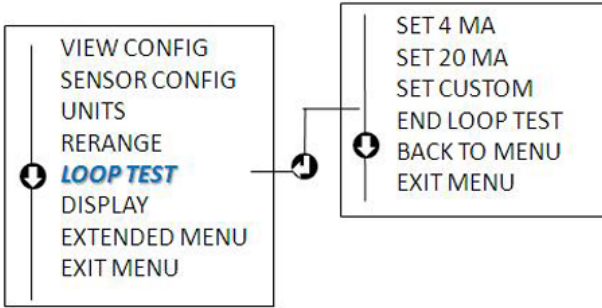
Performing a loop test using Device Manager

1. Right click on the device and select **Service Tools**.
2. In the left navigation pane select **Simulate**.
3. On the *Simulate* tab in the *Analog Output Verification* group box, select the **Perform Loop Test** button.
4. Follow the guided instructions and select **Apply** when complete.

Performing a loop test using the LOI

Reference the figure below to find the path to the Loop Test in the LOI menu.

Figure 9. Configuring the Tag with LOI



3.0 Safety instrumented systems

For Safety Certified installations, refer to the Rosemount 644 [Reference Manual](#). The manual is available electronically at Emerson.com/Rosemount or by contacting an Emerson representative.

4.0 Product Certifications

Rev 2.4

4.1 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 Emerson.com/Rosemount.

4.2 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).

4.3 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

E5 USA Explosionproof, Non-Incendive, Dust-Ignitionproof

Certificate: [XP & DIP]: 3006278; [NI]: 3008880 & 3044581

Standards: FM Class 3600: 2011, FM Class 3615: 2006, FM Class 3616: 2011, FM Class 3810: 2005, ANSI/NEMA®-250: 250: 2003, ANSI/IEC 60529: 2004

Markings: XP CL I, DIV 1, GP B, C, D; DIP CL II/III, DIV 1, GP E, F, G; T5 (-50 °C ≤ T_a ≤ +85 °C); Type 4X; IP66; See I5 description for Non-Incendive markings.

I5 USA Intrinsic Safety and Non-Incendive

Certificate: 3008880 [Headmount Fieldbus/PROFIBUS®, Railmount HART]

Standards: FM Class 3600: 2011, FM Class 3610: 2010, FM Class 3611: 2004, FM Class 3810: 2005, NEMA – 250: 1991

Markings: IS CL I/II/III, DIV I, GP A, B, C, D, E, F, G; NI CL I, DIV 2, GP A, B, C, D

Special Conditions for Safe Use (X):

1. When no enclosure option is selected, the Rosemount 644 Transmitter shall be installed in an enclosure meeting the requirements of ANSI/ISA S82.01 and S82.03 or other applicable ordinary location standards.
2. Option code K5 is only applicable with Rosemount J5 Universal Head (M20 × 1.5) or Rosemount J6 Universal Head (1/2–14 NPT) enclosure.
3. An enclosure option must be selected to maintain a Type 4X rating.

Certificate: 3044581 [Headmount HART]

Standards: FM Class 3600: 2011, FM Class 3610: 2010, FM Class 3611: 2004, FM Class 3810: 2005, ANSI/NEMA – 250: 1991, ANSI/IEC 60529: 2004; ANSI/ISA 60079-0: 2009; ANSI/ISA 60079-11: 2009

Markings: [No Enclosure]: IS CL I, DIV I, GP A, B, C, D T4; CL I ZONE 0 AEx ia IIC T4 Ga; NI CL I, DIV 2, GP A, B, C, D T5
[With Enclosure]: IS CL I/II/III, DIV 1, GP A, B, C, D, E, F, G; NI CL I, DIV 2, GP A, B, C, D; Type 4X; IP68

Special Conditions for Safe Use (X):

1. When no enclosure option is selected, the Rosemount 644 Transmitter shall be installed in a final enclosure meeting type of protection IP20 and meeting the requirements of ANSI/ISA 61010-1 and ANSI/ISA 60079-0.
2. The Rosemount 644 Transmitter optional housings may contain aluminum and is considered a potential risk of ignition by impact or friction. Care must be taken during installation and use to prevent impact and friction.

Canada**I6** Canada Intrinsic Safety and Division 2

Certificate: 1091070

Standards: CAN/CSA C22.2 No. 0-10, CSA Std C22.2 No. 25-1966, 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, C22.2 No 60529-05

Markings: [HART] IS CL I GP A, B, C, D T4/T6; CL I, DIV 2, GP A, B, C, D
[Fieldbus/PROFIBUS] IS CL I GP A, B, C, D T4; CL I, ZONE 0 IIC; CL I, DIV 2, GP A, B, C, D**K6** Canada Explosionproof, Dust-Ignitionproof, Intrinsic Safety and Division 2

Certificate: 1091070

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, C22.2 No 60529-05


Markings: CL I/II/III, DIV 1, GP B, C, D, E, F, G;

See I6 description for Intrinsic Safety and Division 2 markings.

Europe**E1** ATEX Flameproof

Certificate: FM12ATEX0065X

Standards: EN 60079-0: 2012+A11:2013, EN 60079-1: 2014, EN 60529:1991 +A1:2000 +A2:2013

Markings:  II 2 G Ex db IIC T6...T1 Gb, T6(-50 °C ≤ T_a ≤ +40 °C), T5...T1(-50 °C ≤ T_a ≤ +60 °C); See [Table 4](#) for process temperatures.**Specific Conditions of Use (X):**

1. See certificate for ambient temperature range.
2. The non-metallic label may store an electrostatic charge and become a source of ignition in Group III environments.
3. Guard the LCD display cover against impact energies greater than 4 joules.
4. Flameproof joints are not intended for repair.
5. A suitable certified Ex d or Ex tb enclosure is required to be connected to temperature probes with Enclosure option "N".
6. Care shall be taken by the end user to ensure that the external surface temperature on the equipment and the neck of DIN Style Sensor probe does not exceed 130 °C.
7. Non-standard paint options may cause risk from electrostatic discharge. Avoid installations that 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.

I1 ATEX Intrinsic Safety

Certificate: [Headmount HART]: Baseefa12ATEX0101X

[Headmount Fieldbus/PROFIBUS]: Baseefa03ATEX0499X

[Railmount HART]: BAS00ATEX1033X

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

Markings: [HART]: Ex II 1 G Ex ia IIC T6...T4 Ga;

[Fieldbus/PROFIBUS]: Ex II 1 G Ex ia IIC T4 Ga;

See [Table 5](#) for entity parameters and temperature classifications.

Special Conditions for Safe Use (X):

1. The equipment must be installed in an enclosure which affords it a degree of protection of at least IP20 in accordance with the requirements of IEC 60529. Non-metallic enclosures must have a surface resistance of less than $1\text{G}\Omega$; light alloy or zirconium enclosures must be protected from impact and friction when installed in a Zone 0 environment.
2. When fitted with the Transient Protector Assembly, the equipment is not capable of withstanding the 500 V test as defined in Clause 6.3.13 of EN 60079-11:2012. This must be taken into account during installation.

N1 ATEX Type n – with enclosure

Certificate: BAS00ATEX3145

Standards: EN 60079-0: 2012, EN 60079-15: 2010

Markings: Ex II 3 G Ex nA IIC T5 Gc ($-40\text{ }^{\circ}\text{C} \leq T_a \leq +70\text{ }^{\circ}\text{C}$)

NC ATEX Type n – without enclosure

Certificate: [Headmount Fieldbus/PROFIBUS, Railmount HART]: Baseefa13ATEX0093X

[Headmount HART]: Baseefa12ATEX0102U

Standards: EN 60079-0: 2012, EN 60079-15: 2010

Markings: [Headmount Fieldbus/PROFIBUS, Railmount HART]: Ex II 3 G Ex nA IIC T5 Gc ($-40\text{ }^{\circ}\text{C} \leq T_a \leq +70\text{ }^{\circ}\text{C}$)

[Headmount HART]: Ex II 3 G Ex nA IIC T6...T5 Gc; T6($-60\text{ }^{\circ}\text{C} \leq T_a \leq +40\text{ }^{\circ}\text{C}$); T5($-60\text{ }^{\circ}\text{C} \leq T_a \leq +85\text{ }^{\circ}\text{C}$)

Special Conditions for Safe Use (X):

1. The Rosemount 644 Transmitter must be installed in a suitably certified enclosure such that it is afforded a degree of protection of at least IP54 in accordance with IEC 60529 and EN 60079-15.
2. When fitted with the Transient Protector Assembly, the equipment is not capable of withstanding the 500 V test. This must be taken into account during installation.

ND ATEX Dust

Certificate: FM12ATEX0065X

Standards: EN 60079-0: 2012+A1:2013, EN 60079-31: 2014, EN 60529:1991 +A1:2000

Markings: Ex II 2 D Ex tb IIIC T130 °C Db, ($-40\text{ }^{\circ}\text{C} \leq T_a \leq +70\text{ }^{\circ}\text{C}$); IP66;

See [Table 4](#) for process temperatures.

Specific Conditions of Use (X):

1. See certificate for ambient temperature range.
2. The non-metallic label may store an electrostatic charge and become a source of ignition in Group III environments.
3. Guard the LCD display cover against impact energies greater than 4 joules.
4. Flameproof joints are not intended for repair.

5. A suitable certified Ex d or Ex tb enclosure is required to be connected to temperature probes with Enclosure option "N".
6. Care shall be taken by the end user to ensure that the external surface temperature on the equipment and the neck of DIN Style Sensor probe does not exceed 130 °C.
7. Non-Standard Paint options may cause risk from electrostatic discharge. Avoid installations that 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.

International

E7 IECEx Flameproof

Certificate: IECEx FMG 12.0022X

Standards: IEC 60079-0: 2011, IEC 60079-1: 2014

Markings: Ex db IIC T6...T1 Gb, T6(-50 °C ≤ T_a ≤ +40 °C), T5...T1(-50 °C ≤ T_a ≤ +60 °C);
See [Table 4](#) for process temperatures.

Specific Conditions of Use (X):

1. See certificate for ambient temperature range.
2. The non-metallic label may store an electrostatic charge and become a source of ignition in Group III environments.
3. Guard the LCD display cover against impact energies greater than 4 joules.
4. Flameproof joints are not intended for repair.
5. A suitable certified Ex d or Ex tb enclosure is required to be connected to temperature probes with Enclosure option "N".
6. Care shall be taken by the end user to ensure that the external surface temperature on the equipment and the neck of DIN Style Sensor probe does not exceed 130 °C.
7. Non-Standard Paint options may cause risk from electrostatic discharge. Avoid installations that 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.

I7 IECEx Intrinsic Safety

Certificate: [Headmount HART]: IECEx BAS 12.0069X

[Headmount Fieldbus/PROFIBUS, Railmount HART]: IECEx BAS 07.0053X

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

Markings: Ex ia IIC T6...T4 Ga;

See [Table 5](#) for Entity Parameters and Temperature Classifications.

Special Conditions of Certification (X):

1. The equipment must be installed in an enclosure which affords it a degree of protection of at least IP20 in accordance with the requirements of IEC 60529. Non-metallic enclosures must have a surface resistance of less than 1GΩ; light alloy or zirconium enclosures must be protected from impact and friction when installed in a Zone 0 environment.
2. When fitted with the Transient Protector Assembly, the equipment is not capable of withstanding the 500 V test as defined in Clause 6.3.13 of IEC 60079-11:2011. This must be taken into account during installation.

N7 IECEx Type n – with enclosure

Certificate: IECEx BAS 07.0055

Standards: IEC 60079-0: 2011, IEC 60079-15: 2010

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

NG IECEx Type n – without enclosure

Certificate: [Headmount Fieldbus/PROFIBUS, Railmount HART]: IECEx BAS 13.0053X
 [Headmount HART]: IECEx BAS 12.0070U

Standards: IEC 60079-0: 2011, IEC 60079-15: 2010

Markings: [Headmount Fieldbus/PROFIBUS, Railmount HART]: Ex nA IIC T5 Gc ($-40\text{ °C} \leq T_a \leq +70\text{ °C}$)
 [Headmount HART]: Ex nA IIC T6...T5 Gc; T6($-60\text{ °C} \leq T_a \leq +40\text{ °C}$); T5($-60\text{ °C} \leq T_a \leq +85\text{ °C}$)

Special Conditions of Certification (X):

1. The Rosemount 644 Transmitter must be installed in a suitably certified enclosure such that it is afforded a degree of protection of at least IP54 in accordance with IEC 60529 and IEC 60079-15.
2. When fitted with the Transient Protector Assembly, the equipment is not capable of withstanding the 500 V test. This must be taken into account during installation.

NK IECEx Dust

Certificate: IECEx FMG 12.0022X

Standards: IEC 60079-0: 2011, IEC 60079-31: 2013

Markings: Ex tb IIIC T130 °C Db, ($-40\text{ °C} \leq T_a \leq +70\text{ °C}$); IP66;

See [Table 4](#) for process temperatures.

Specific Conditions of Use (X):

1. See certificate for ambient temperature range.
2. The non-metallic label may store an electrostatic charge and become a source of ignition in Group III environments.
3. Guard the LCD display cover against impact energies greater than 4 joules.
4. Flameproof joints are not intended for repair.
5. A suitable certified Ex d or Ex tb enclosure is required to be connected to temperature probes with Enclosure option "N".
6. Care shall be taken by the end user to ensure that the external surface temperature on the equipment and the neck of DIN Style Sensor probe does not exceed 130 °C.
7. Non-Standard Paint options may cause risk from electrostatic discharge. Avoid installations that 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.

Brazil**E2** INMETRO Flameproof and Dust

Certificate: UL-BR 13.0535X

Standards: ABNT NBR IEC 60079-0:2013, ABNT NBR IEC 60079-1:2016, ABNT NBR IEC 60079-31:2014

Markings: Ex db IIC T6...T1 Gb; T6...T1: ($-50\text{ °C} \leq T_a \leq +40\text{ °C}$), T5...T1: ($-50\text{ °C} \leq T_a \leq +60\text{ °C}$) Ex tb IIIC T130 °C Db; IP66; ($-40\text{ °C} \leq T_a \leq +70\text{ °C}$)

Special Conditions for Safe Use (X):

1. See product description for ambient temperature limits and process temperature limits.
2. The non-metallic label may store an electrostatic charge and become a source of ignition in Group III environments.
3. Guard the LCD display cover against impact energies greater than 4 joules.
4. Consult the manufacturer if dimensional information on the flameproof joints is necessary.

I2 INMETRO Intrinsic Safety

Certificate: [Fieldbus]: UL-BR 15.0264X

[HART]: UL-BR 14.0670X

Standards: ABNT NBR IEC 60079-0:2008 + Corrigendum 1:2011, ABNT NBR IEC 60079-11:2011

Markings: [Fieldbus]: Ex ia IIC T* Ga (-60 °C ≤ T_a ≤ +** °C)[HART]: Ex ia IIC T* Ga (-60 °C ≤ T_a ≤ +** °C)See [Table 5](#) for entity parameters and temperature classifications.**Special Conditions for Safe Use (X):**

1. The apparatus must be installed in an enclosure which affords it a degree of protection of at least IP20.
2. Non-metallic enclosures must have a surface resistance of less than 1 GΩ; light alloy or zirconium enclosures must be protected from impact and friction when installed in a zone 0 environment.
3. When fitted with the Transient Protector Assembly, the equipment is not capable of withstanding the 500 V test as defined on ABNT NBR IEC 60079-11. This must be taken into account during installation.
4. The ingress protection degree IP66 is provided only for The Model 644 Field Mount Assembly which is formed by installing an Enhanced Model 644 Temperature Transmitter within a dual-compartment enclosure Plantweb enclosure.

China**E3 China Flameproof**

Certificate: GYJ16.1192X

Standards: GB3836.1-2010, GB3836.2-2010, GB12476.1-2013, GB12476.5-2013

Markings: Ex d IIC T6...T1; Ex tD A21 T130 °C; IP66

Special Conditions for Safe Use (X):

1. Temperature Assembly using temperature sensor type 65, 68, 75, 183, 185 are certified.
2. The ambient temperature range is:

Gas/dust	T code	Ambient temperature
Gas	T6	-50 °C ≤ T _a ≤ +40 °C
	T5...T1	-50 °C ≤ T _a ≤ +60 °C
Dust	N/A	-40 °C ≤ T _a ≤ +70 °C

3. The earth connection facility in the enclosure should be connected reliably.
4. During installation, use and maintenance in explosive gas atmospheres, observe the warning "Do not open when energized". During installation, use and maintenance in explosive dust atmosphere, observe the warning "Do not open when an explosive dust atmosphere is present".
5. During installation, there should be no mixture harmful to flameproof housing.
6. During installation in hazardous location, cable glands, conduits and blanking plugs, certified by state-appointed inspection bodies with Ex d IIC, Ex tD A21 IP66 degree, should be used.
7. Maintenance should be done in a non-hazardous location.
8. During installation, use and maintenance in explosive dust atmosphere, product enclosure should be cleaned to avoid dust accumulation, but compressed air should not be used.
9. End users are not permitted to change any components inside, but to settle the problem in conjunction with manufacturer to avoid damage to the product.

10. During installation, use and maintenance of this product, observe the following standards:
- GB3836.13-2013 “Electrical apparatus for explosive gas atmospheres Part 13: Repair and overhaul for apparatus used in explosive gas atmospheres”
 - GB3836.15-2000 “Electrical apparatus for explosive gas atmospheres Part 15: Electrical installations in hazardous area (other than mines)”
 - GB3836.16-2006 “Electrical apparatus for explosive gas atmospheres Part 16: Inspection and maintenance of electrical installation (other than mines)”
 - GB50257-2014 “Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering”.
 - GB15577-2007 “Safe regulation for explosive dust atmospheres”
 - GB12476.2-2010 “Electrical apparatus for use in the presence of combustible dust Part 1-2: Electrical apparatus protected by enclosures and surface temperature limitation-Selection, installation and maintenance”
- I3** China Intrinsic Safety
- Certificate: GYJ16.1191X
- Standards: GB3836.1-2010, GB3836.4-2010, GB3836.20-1010
- Markings: Ex ia IIC T4~T6 Ga

Special Conditions for Safe Use (X):

1. The ambient temperature range is:
For Rosemount 644 Fieldbus, PROFIBUS, and Legacy 644 HART:

Transmitter output	Max input power: (W)	T code	Ambient temperature
A	0.67	T6	$-60\text{ }^{\circ}\text{C} \leq T_a \leq +40\text{ }^{\circ}\text{C}$
	0.67	T5	$-60\text{ }^{\circ}\text{C} \leq T_a \leq +50\text{ }^{\circ}\text{C}$
	1	T5	$-60\text{ }^{\circ}\text{C} \leq T_a \leq +40\text{ }^{\circ}\text{C}$
	1	T4	$-60\text{ }^{\circ}\text{C} \leq T_a \leq +80\text{ }^{\circ}\text{C}$
F or W	1.3	T4	$-50\text{ }^{\circ}\text{C} \leq T_a \leq +60\text{ }^{\circ}\text{C}$
	5.32	T4	$-50\text{ }^{\circ}\text{C} \leq T_a \leq +60\text{ }^{\circ}\text{C}$

For Enhanced Rosemount 644 HART:

Max input power: (W)	T code	Ambient temperature
0.67	T6	$-60\text{ }^{\circ}\text{C} \leq T_a \leq +40\text{ }^{\circ}\text{C}$
0.67	T5	$-60\text{ }^{\circ}\text{C} \leq T_a \leq +50\text{ }^{\circ}\text{C}$
0.80	T5	$-60\text{ }^{\circ}\text{C} \leq T_a \leq +40\text{ }^{\circ}\text{C}$
0.80	T4	$-60\text{ }^{\circ}\text{C} \leq T_a \leq +80\text{ }^{\circ}\text{C}$

2. Parameters:

For Rosemount 644 Fieldbus, PROFIBUS, and Legacy 644 HART:

Terminals of power supply (+, -)

Transmitter output	Max input voltage: U_i (V)	Max input current: I_i (mA)	Max input power: P_i (W)	Max internal parameters:	
				C_i (nF)	L_i (mH)
A	30	200	0.67/1	10	0
F,W	30	300	1.3	2.1	0
F,W (FISCO)	17.5	380	5.32	2.1	0

Terminals of sensor (1,2,3,4)

Transmitter output	Max output voltage: U_o (V)	Max output current: I_o (mA)	Max output power: P_o (W)	Max internal parameters:	
				C_o (nF)	L_o (mH)
A	13.6	80	0.08	75	0
F,W	13.9	23	0.079	7.7	0

For Enhanced Rosemount 644 HART:

Terminals of power supply (+, -)

Max input voltage: U_i (V)	Max input current: I_i (mA)	Max input power: P_i (W)	Max internal parameters:	
			C_i (nF)	L_i (mH)
30	150 ($T_a \leq +80^\circ\text{C}$)	0.67/0.8	3.3	0
	170 ($T_a \leq +70^\circ\text{C}$)			
	190 ($T_a \leq +60^\circ\text{C}$)			

Terminals of sensor (1,2,3,4)

Max output voltage: U_o (V)	Max output current: I_o (mA)	Max output power: P_o (W)	Gas group	Max internal parameters:	
				C_o (nF)	L_o (mH)
13.6	80	0.08	IIC	0.816	5.79
			IIB	5.196	23.4
			IIA	18.596	48.06

- This product complies to the requirements for FISCO field devices specified in IEC60079-27: 2008. For the connection of an intrinsically safe circuit in accordance FISCO model, FISCO parameters of this product are as above.
- The product should be used with Ex-certified associated apparatus to establish explosion protection system that can be used in explosive gas atmospheres. Wiring and terminals should comply with the instruction manual of the product and associated apparatus.
- The cables between this product and associated apparatus should be shielded cables (the cables must have insulated shield). The shielded has to be grounded reliably in non-hazardous area.

6. End users are not permitted to change any components inside, but to settle the problem in conjunction with manufacturer to avoid damage to the product.
7. During installation, use and maintenance of this product, observe the following standards:
 - GB3836.13-2013 “Electrical apparatus for explosive gas atmospheres Part 13: Repair and overhaul for apparatus used in explosive gas atmospheres”.
 - GB3836.15-2000 “Electrical apparatus for explosive gas atmospheres Part 15: Electrical installations in hazardous area (other than mines)”.
 - GB3836.16-2006 “Electrical apparatus for explosive gas atmospheres Part 16: Inspection and maintenance of electrical installation (other than mines)”.
 - GB3836.18-2010 “Explosive Atmospheres” Part 18: Intrinsically safe systems.
 - GB50257-2014 “Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering”.

N3 China Type n

Certificate: GYJ15.1502

Standards: GB3836.1-2000, GB3836.8-2014

Markings: Ex nA IIC T5/T6 Gc

Special Conditions for Safe Use (X):

1. The relation among T code, ambient temperature range is as following:
For Rosemount 644 Fieldbus, PROFIBUS, and Legacy 644 HART:

T code	Ambient temperature
T5	$-40\text{ }^{\circ}\text{C} \leq T_a \leq +70\text{ }^{\circ}\text{C}$

For Enhanced Rosemount 644 HART:

T code	Ambient temperature
T6	$-60\text{ }^{\circ}\text{C} \leq T_a \leq +40\text{ }^{\circ}\text{C}$
T5	$-60\text{ }^{\circ}\text{C} \leq T_a \leq +85\text{ }^{\circ}\text{C}$

2. Maximum input voltage: 42.4 V.
3. Cable glands, conduit or blanking plugs, certified by NEPSI with Ex e or Ex n protection type and appropriate thread type and IP54 degree, should be used on external connections and redundant cable entries.
4. Maintenance should be done in non-hazardous location.
5. End users are not permitted to change any components inside, but to settle the problem in conjunction with manufacturer to avoid damage to the product.
6. During installation, use and maintenance of this product, observe the following standards:
 - GB3836.13-2013 “Electrical apparatus for explosive gas atmospheres Part 13: Repair and overhaul for apparatus used in explosive gas atmospheres”.
 - GB3836.15-2000 “Electrical apparatus for explosive gas atmospheres Part 15: Electrical installations in hazardous area (other than mines)”.
 - GB3836.16-2006 “Electrical apparatus for explosive gas atmospheres Part 16: Inspection and maintenance of electrical installation (other than mines)”.
 - GB50257-2014 “Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering”.

EAC – Belarus, Kazakhstan, Russia

EM Technical Regulation Customs Union (EAC) Flameproof

Certificate: RU C-US.GB05.B.00289

Standards: GOST R IEC 60079-0-2011, GOST IEC 60079-1-2011

Markings: 1Ex d IIC T6...T1 Gb X, T6(-50 °C ≤ T_a ≤ +40 °C), T5...T1(-50 °C ≤ T_a ≤ +60 °C);
IP66/IP68

Special Condition for Safe Use (X):

1. See certificate for special conditions.

IM Technical Regulation Customs Union (EAC) Intrinsic Safety

Certificate: RU C-US.GB05.B.00289

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

Markings: [HART]: 0Ex ia IIC T6...T4 Ga X; [Fieldbus/Profibus]: 0Ex ia IIC T4 Ga X

Special Condition for Safe Use (X):

1. See certificate for special conditions.

KM Technical Regulation Customs Union (EAC) Flameproof, Intrinsic Safety, and Dust-Ignitionproof

Standards: GOST R IEC 60079-0:2011, GOST IEC 60079-1:2011, GOST R IEC 60079-11-2011, GOST R IEC 60079-31-2010

Markings: Ex tb IIC T130°C Db X;

See EM for Flameproof Markings and see IM for Intrinsic Safety Markings.

Special Condition for Safe Use (X):

1. See certificate for special conditions.

Japan

E4 Japan Flameproof

Certificate: TC20671 [J2 with LCD], TC20672 [J2], TC20673 [J6 with LCD], TC20674 [J6]

Markings: Ex d IIC T5

Combinations

K1 Combination of E1, I1, N1, and ND

K2 Combination of E2 and I2

K5 Combination of E5 and I5

K7 Combination of E7, I7, NK, and N7

KA Combination of K6, E1, and I1

KB Combination of K5 and K6

KC Combination of I5 and I6

KD Combination of E5, I5, K6, E1, and I1

Additional certifications (these are not for railmount)

SB5 American Bureau of Shipping (ABS) Type Approval

Certificate: 11-HS771994A-1-PDA

SBV Bureau Veritas (BV) Type Approval

Certificate: 26325/A3 BV

Requirements: Bureau Veritas Rules for the Classification of Steel Ships

Application: Class notations: AUT-UMS, AUT-CCS, AUT-PORT and AUT-IMS

SDN Det Norske Veritas (DNV) Type Approval

Certificate: A-14187

Application: Location Classes: Temperature: D; Humidity: B; Vibration: A; EMC: B;
Enclosure: B/IP66: A, C/IP66: SST**SLL** Lloyds Register (LR) Type Approval

Certificate: 11/60002

Application: For use in environmental categories ENV1, ENV2, ENV3, and ENV5.

4.4 Specification tables




Table 4. Process Temperature

		T6	T5	T4	T3	T2	T1	T130	
Max Ambient		+40 °C	+60 °C	+60 °C	+60 °C	+60 °C	+60 °C	+70 °C	
Transmitter with LCD display									
Sensor Extension	0-in.	55 °C	70 °C	95 °C	95 °C	95 °C	95 °C	95 °C	
	3-in.	55 °C	70 °C	100 °C	100 °C	100 °C	100 °C	100 °C	
	6-in.	60 °C	70 °C	100 °C	100 °C	100 °C	100 °C	100 °C	
	9-in.	65 °C	75 °C	110 °C	110 °C	110 °C	110 °C	110 °C	
	Transmitter without LCD display								
	0-in.	55 °C	70 °C	100 °C	170 °C	280 °C	440 °C	100 °C	
	3-in.	55 °C	70 °C	110 °C	190 °C	300 °C	450 °C	110 °C	
	6-in.	60 °C	70 °C	120 °C	200 °C	300 °C	450 °C	110 °C	
9-in.	65 °C	75 °C	130 °C	200 °C	300 °C	450 °C	120 °C		

Table 5. Entity Parameters

	Fieldbus/PROFIBUS [FISCO]	HART	HART (Enhanced)
U_i (V)	30 [17.5]	30	30
I_i (mA)	300 [380]	200	150 for $T_a \leq 80$ °C 170 for $T_a \leq 70$ °C 190 for $T_a \leq 60$ °C
P_i (W)	1.3 at T4 (-50 °C $\leq T_a \leq +60$ °C) [5.32 at T4 (-50 °C $\leq T_a \leq +60$ °C)]	.67 at T6 (-60 °C $\leq T_a \leq +40$ °C) .67 at T5 (-60 °C $\leq T_a \leq +50$ °C) 1.0 at T5 (-60 °C $\leq T_a \leq +40$ °C) 1.0 at T4 (-60 °C $\leq T_a \leq +80$ °C)	.67 at T6 (-60 °C $\leq T_a \leq +40$ °C) .67 at T5 (-60 °C $\leq T_a \leq +50$ °C) .80 at T5 (-60 °C $\leq T_a \leq +40$ °C) .80 at T4 (-60 °C $\leq T_a \leq +80$ °C)
C_i (nF)	2.1	10	3.3
L_i (mH)	0	0	0

Figure 10. Rosemount 644 Declaration of Conformity

	EU Declaration of Conformity No: RMD 1016 Rev. V	
<p>We,</p>		
<p>Rosemount, Inc. 8200 Market Boulevard Chanhasen, MN 55317-9685 USA</p>		
<p>declare under our sole responsibility that the product,</p>		
<p>Rosemount™ 644 Temperature Transmitter</p>		
<p>manufactured by,</p>		
<p>Rosemount, Inc. 8200 Market Boulevard Chanhasen, 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>		
	<p>Vice President of Global Quality</p>	
<p>(signature)</p>	<p>(function)</p>	
<p>Chris LaPoint</p>	<p>6-Sept-2017</p>	
<p>(name)</p>	<p>(date of issue)</p>	
<p>Page 1 of 4</p>		



EU Declaration of Conformity

No: RMD 1016 Rev. V



EMC Directive (2014/30/EU)

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

ATEX Directive (2014/34/EU)

Rosemount 644 Enhanced Head/Field Mount Temperature Transmitters (Analog/HART Output)

Baseefa12ATEX0101X – Intrinsic Safety Certificate

Equipment Group II, Category 1 G

Ex ia IIC T6...T4 Ga

Harmonized Standards:

EN 60079-0:2012; EN 60079-11:2012

Baseefa12ATEX0102U – Type n Certificate; no enclosure option

Equipment Group II, Category 3 G

Ex nA IIC T6...T5 Gc

Harmonized Standards:

EN 60079-0:2012; EN 60079-15:2010

Rosemount 644 Head Mount Temperature Transmitter (Fieldbus Output)

Baseefa03ATEX0499X – Intrinsic Safety Certificate

Equipment Group II, Category 1 G

Ex ia IIC T4 Ga

Harmonized Standards:

EN 60079-0: 2012; EN 60079-11: 2012

Baseefa13ATEX0093X – Type n Certificate; no enclosure option

Equipment Group II, Category 3 G

Ex nA IIC T5 Gc

Harmonized Standards:

EN 60079-0: 2012+A11:2013; EN 60079-15: 2010



EU Declaration of Conformity

No: RMD 1016 Rev. V



Rosemount 644 Head/Field Mount Temperature Transmitter (All output protocols)

FM12ATEX0065X – Flameproof Certificate

Equipment Group II, Category 2 G

Ex db IIC T6...T1 Gb

Harmonized Standards:

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

FM12ATEX0065X – Dust Certificate

Equipment Group II, Category 2 D

Ex tb IIIC T130°C Db

Harmonized Standards:

EN 60079-0:2012+A11:2013, EN 60079-31:2014

BAS00ATEX3145 – Type n Certificate

Equipment Group II, Category 3 G

Ex nA IIC T5 Gc

Harmonized Standards:

EN 60079-0: 2012+A11:2013; EN 60079-15: 2010

Rosemount 644R Rail Mount Temperature Transmitters (HART Output)

Baseefa00ATEX1033X – Intrinsic Safety Certificate

Equipment Group II, Category 1 G

Ex ia IIC T6...T4 Ga

Harmonized Standards:

EN 60079-0: 2012; EN 60079-11: 2012

Baseefa13ATEX0093X – Type n Certificate

Equipment Group II, Category 3 G

Ex nA IIC T5 Gc

Harmonized Standards:

EN 60079-0: 2012+A11:2013; EN 60079-15: 2010

RoHS Directive (2011/65/EU)

644 HART Head Mount

Harmonized Standard: EN 50581:2012



EU Declaration of Conformity

No: RMD 1016 Rev. V



ATEX Notified Bodies

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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 644
List of Rosemount 644 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	O	O	O	O	O	O
壳体组件 Housing Assembly	O	O	O	O	O	O
传感器组件 Sensor Assembly	O	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.