Note:
Before installing the transmitter, confirm the correct Device Driver is loaded on the host systems. See page 3 for System Readiness.
NOTICE

This installation guide provides basic guidelines for Rosemount 644 transmitters. It does not provide instructions for configuration, diagnostics, maintenance, service, troubleshooting, Explosion-proof, Flameproof, or intrinsically safe (I.S.) installations. Refer to the Rosemount 644 reference manual (document number 00809-0100-4728) for more instruction. This manual is also available electronically on www.rosemount.com.

WARNING

Explosions could result in death or serious injury:

Installation of this transmitter in an explosive environment must be in accordance with the appropriate local, national, and international standards, codes, and practices. Please review the approvals section of the 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 that may be present on leads can cause electrical shock.

Conduit/Cable Entries:

Unless marked, the conduit/cable entries in the transmitter housing use a 1/2-14 NPT thread form. Entries marked “M20” are M20 x 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.

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System readiness ........................ 3  
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Confirm correct device driver ........... 3  
Transmitter installation ................. 4  
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System readiness

Confirm HART revision capability

- If using HART based control or asset management systems, please 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 Step 2: Verify configuration on page 4.

Confirm correct device driver

- Verify the latest Device Driver files are loaded on your systems to ensure proper communications.

Rosemount 644 device revisions and files

Table 1 provides the information necessary to ensure you have the correct Device Driver files and Documentation for your device.

Table 1. Rosemount 644 Device Revisions and Files

<table>
<thead>
<tr>
<th>Software Date</th>
<th>Identify Device</th>
<th>Find Device Driver Files</th>
<th>Review Instructions</th>
<th>Review Functionality</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 2012</td>
<td>NAMUR Software Revision</td>
<td>HART Software Revision</td>
<td>HART Universal Revision</td>
<td>Device Revision</td>
</tr>
<tr>
<td></td>
<td>1.1.1</td>
<td>01</td>
<td>5</td>
<td>8</td>
</tr>
</tbody>
</table>

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).
Transmitter installation

Step 1: Set the alarm switch

Set the 644 Alarm Switch before putting the device into operation.

Without a LCD Display
1. Set the loop to manual (if applicable) and disconnect the power.
2. Remove the housing cover.
3. Set the switch to the desired position. H indicates High, L indicates Low. Then reattach the housing cover.
4. Apply power and set the loop to automatic control.

Figure 1. Placement of Alarm Switch

Note
If using an LCD Display, first remove the display by detaching it from the top of the device, set the switch to the desired position and reattach the LCD Display.

Step 2: Verify configuration

Verify the configuration of the Rosemount 644 device upon receiving your transmitter using any HART compliant configuration tool. See the Rosemount 644 Reference Manual (00809-0200-4728) for configuration instructions using AMS Device Manager.

The 644 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. Refer to the 644 Reference Manual (document number 00809-0200-4728) and the Field Communicator Reference Manual for more information.
Verify configuration with a field communicator

A Rosemount 644 DD 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 6. For fast key sequences using legacy DD's, contact your local Emerson Process Management 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 device descriptors (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 the advanced features of the transmitter, the user will experience trouble communicating and will be prompted to turn the communicator off. 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 www.fieldcommunicator.com 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

644 Temperature: 644TT
Online

1. Overview
2. Configure
3. Service Tools

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

<table>
<thead>
<tr>
<th>Function</th>
<th>HART 5</th>
<th>HART 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm Values</td>
<td>2, 2, 5, 6</td>
<td>2, 2, 5, 6</td>
</tr>
<tr>
<td>Analog Calibration</td>
<td>3, 4, 5</td>
<td>3, 4, 5</td>
</tr>
<tr>
<td>Analog Output</td>
<td>2, 2, 5, 1</td>
<td>2, 2, 5, 1</td>
</tr>
<tr>
<td>Average Temperature Setup</td>
<td>2, 2, 3, 3</td>
<td>2, 2, 3, 3</td>
</tr>
<tr>
<td>Burst Mode</td>
<td>2, 2, 8, 4</td>
<td>2, 2, 8, 4</td>
</tr>
<tr>
<td>Comm Status</td>
<td></td>
<td>1, 2</td>
</tr>
<tr>
<td>Configure additional messages</td>
<td></td>
<td>2, 2, 8, 4, 7</td>
</tr>
<tr>
<td>Configure Hot Backup</td>
<td>2, 2, 4, 1, 3</td>
<td>2, 2, 4, 1, 3</td>
</tr>
<tr>
<td>D/A Trim</td>
<td>3, 4, 4, 1</td>
<td>3, 4, 4, 1</td>
</tr>
<tr>
<td>Damping Values</td>
<td>2, 2, 1, 5</td>
<td>2, 2, 1, 6</td>
</tr>
<tr>
<td>Date</td>
<td>2, 2, 7, 1, 2</td>
<td>2, 2, 7, 1, 3</td>
</tr>
<tr>
<td>Display Setup</td>
<td>2, 1, 4</td>
<td>2, 1, 4</td>
</tr>
<tr>
<td>Descriptor</td>
<td>2, 2, 7, 1, 4</td>
<td>2, 2, 7, 1, 5</td>
</tr>
<tr>
<td>Device Information</td>
<td>1, 8, 1</td>
<td>1, 8, 1</td>
</tr>
<tr>
<td>Differential Temperature Setup</td>
<td>2, 2, 3, 1</td>
<td>2, 2, 3, 1</td>
</tr>
<tr>
<td>Drift Alert</td>
<td>2, 2, 4, 2</td>
<td>2, 2, 4, 2</td>
</tr>
<tr>
<td>Function</td>
<td>HART 5</td>
<td>HART 7</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Filter 50/60 Hz</td>
<td>2, 2, 7, 4, 1</td>
<td>2, 2, 7, 4, 1</td>
</tr>
<tr>
<td>First Good Temperature Setup</td>
<td>2, 2, 3, 2</td>
<td>2, 2, 3, 2</td>
</tr>
<tr>
<td>Hardware Revision</td>
<td>1, 8, 2, 3</td>
<td>1, 8, 2, 3</td>
</tr>
<tr>
<td>HART Lock</td>
<td></td>
<td>2, 2, 9, 2</td>
</tr>
<tr>
<td>Intermittent Sensor Detect</td>
<td>2, 2, 7, 4, 2</td>
<td>2, 2, 7, 4, 2</td>
</tr>
<tr>
<td>Loop Test</td>
<td>3, 5, 1</td>
<td>3, 5, 1</td>
</tr>
<tr>
<td>Locate Device</td>
<td></td>
<td>3, 4, 6, 2</td>
</tr>
<tr>
<td>Lock Status</td>
<td></td>
<td>1, 8, 3, 8</td>
</tr>
<tr>
<td>LRV (Lower Range Value)</td>
<td>2, 2, 5, 5, 3</td>
<td>2, 2, 5, 5, 3</td>
</tr>
<tr>
<td>LSL (Lower Sensor Limit)</td>
<td>2, 2, 1, 7, 2</td>
<td>2, 2, 1, 8, 2</td>
</tr>
<tr>
<td>Message</td>
<td>2, 2, 7, 1, 3</td>
<td>2, 2, 7, 1, 4</td>
</tr>
<tr>
<td>Open Sensor Holdoff</td>
<td>2, 2, 7, 3</td>
<td>2, 2, 7, 3</td>
</tr>
<tr>
<td>Percent Range</td>
<td>2, 2, 5, 2</td>
<td>2, 2, 5, 2</td>
</tr>
<tr>
<td>Sensor 1 Configuration</td>
<td>2, 1, 1</td>
<td>2, 1, 1</td>
</tr>
<tr>
<td>Sensor 2 Configuration</td>
<td>2, 1, 1</td>
<td>2, 1, 1</td>
</tr>
<tr>
<td>Sensor 1 Serial Number</td>
<td>2, 2, 1, 6</td>
<td>2, 2, 1, 7</td>
</tr>
<tr>
<td>Sensor 2 Serial Number</td>
<td>2, 2, 2, 7</td>
<td>2, 2, 2, 8</td>
</tr>
<tr>
<td>Sensor 1 Type</td>
<td>2, 2, 1, 2</td>
<td>2, 2, 1, 3</td>
</tr>
<tr>
<td>Sensor 2 Type</td>
<td>2, 2, 2, 2</td>
<td>2, 2, 2, 3</td>
</tr>
<tr>
<td>Sensor 1 Unit</td>
<td>2, 2, 1, 4</td>
<td>2, 2, 1, 5</td>
</tr>
<tr>
<td>Sensor 2 Unit</td>
<td>2, 2, 2, 4</td>
<td>2, 2, 2, 5</td>
</tr>
<tr>
<td>Sensor 1 Status</td>
<td></td>
<td>2, 2, 1, 2</td>
</tr>
<tr>
<td>Sensor 2 Status</td>
<td></td>
<td>2, 2, 2, 2</td>
</tr>
<tr>
<td>Simulate Digital Signal</td>
<td></td>
<td>3, 5, 2</td>
</tr>
<tr>
<td>Software Revision</td>
<td>1, 8, 2, 4</td>
<td>1, 8, 2, 4</td>
</tr>
<tr>
<td>Tag</td>
<td>2, 2, 7, 1, 1</td>
<td>2, 2, 7, 1, 1</td>
</tr>
<tr>
<td>Long Tag</td>
<td>2, 2, 7, 1, 2</td>
<td>2, 2, 7, 1, 2</td>
</tr>
<tr>
<td>Terminal Temperature</td>
<td>2, 2, 7, 1</td>
<td>2, 2, 8, 1</td>
</tr>
<tr>
<td>URV (Upper Range Value)</td>
<td>2, 2, 5, 5, 2</td>
<td>2, 2, 5, 5, 2</td>
</tr>
<tr>
<td>USL (Upper Sensor Limit)</td>
<td>2, 2, 1, 7, 2</td>
<td>2, 2, 1, 8, 2</td>
</tr>
<tr>
<td>Variable Mapping</td>
<td>2, 2, 8, 5</td>
<td>2, 2, 8, 5</td>
</tr>
<tr>
<td>2-wire Offset Sensor 1</td>
<td>2, 2, 1, 9</td>
<td>2, 2, 1, 10</td>
</tr>
<tr>
<td>2-wire Offset Sensor 2</td>
<td>2, 2, 2, 9</td>
<td>2, 2, 2, 10</td>
</tr>
</tbody>
</table>
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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. Set the control loop to manual and select OK.
2. Select Cal VanDusen at the ENTER SENSOR TYPE prompt.
3. Select the appropriate number of wires at the ENTER SENSOR CONNECTION prompt.
4. Enter the Ro, Alpha, Delta, and Beta values from the stainless steel tag attached to the special-order sensor when prompted.
5. Return the control loop to automatic control and select OK.
6. To disable the transmitter-sensor matching feature from the HOME screen select 2 Configure, 2 Manual Setup, 1 Sensor, 10 SensorMatching-CVD.
   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.

Table 3. LOI Button Operation

<table>
<thead>
<tr>
<th>Button</th>
<th>Exit Menu?</th>
<th>Scroll</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left</td>
<td>No</td>
<td>SCROLL</td>
</tr>
<tr>
<td>Right</td>
<td>Yes</td>
<td>ENTER</td>
</tr>
</tbody>
</table>
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.

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 6 to change HART revision when the correct Device Driver is loaded.
Step 3: Mount the transmitter

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

Typical connection head installation

Head mount transmitter with DIN plate style sensor
1. Attach the thermowell to the pipe or process container wall. Install and tighten the thermowell before applying process pressure.
2. Verify the transmitter failure mode switch position.
3. Assemble the transmitter to the sensor. Push the transmitter mounting screws through the sensor mounting plate.
4. Wire the sensor to the transmitter (see Step 4: Wire And Apply Power).
5. Insert the transmitter-sensor assembly into the connection head. Thread the transmitter mounting screw into the connection head mounting holes. Assemble the extension to the connection head. Insert the assembly into the thermowell.
6. If using a cable gland, properly attach the cable gland to a housing conduit entry.
7. Insert the shielded cable leads into the connection head through the cable entry.
8. Connect the shielded power cable leads to the transmitter power terminals. Avoid contact with sensor leads and sensor connections. Connect and tighten the cable gland.
9. Install and tighten the connection head cover. Enclosure covers must be fully engaged to meet explosion-proof requirements.
Typical universal head installation

Head mount transmitter with threaded sensor
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. Seal the nipple and adapter threads with silicone tape.
3. Screw the sensor into the thermowell. Install drain seals if required for severe environments or to satisfy code requirements.
4. Verify the transmitter failure mode switch is in the desired position.
5. Pull the sensor wiring leads through the universal head and transmitter center hole. Mount the transmitter in the universal head by threading the transmitter mounting screws into the universal head mounting holes.
6. Mount the transmitter-sensor assembly into the thermowell, or remote mount if desired. Seal adapter threads with silicone tape.
7. 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.
8. Install and tighten the universal head cover. Enclosure covers must be fully engaged to meet explosion-proof requirements.
Quick Start Guide

Step 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. 644 Single and Dual Input Wiring Diagrams

*The transmitter must be configured for at least a 3-wire RTD in order to recognize an RTD with a compensation loop.

**Rosemount Inc. provides a 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.
Power the transmitter
1. An external power supply is required to operate the transmitter.
2. Remove the housing cover (if applicable).
3. Connect the positive power lead to the “+” terminal. Connect the negative power lead to the “–” terminal.
4. Tighten the terminal screws. When tightening the sensor and power wires, the max torque is 6 in.-lbs (0.7 N-m).
5. Reattach and tighten the cover (if applicable).
6. 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 that 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 feet (1500 meters).

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.
**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 that the sensor shield is electrically isolated from the surrounding grounded fixtures.

Connect shields together, electrically isolated from the transmitter.
**Option 3:**
1. Ground sensor wiring shield at the sensor, if possible.
2. Insure that 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.

**Grounded thermocouple inputs**

**Option 1:**
1. Ground sensor wiring shield at the sensor.
2. Ensure that 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.
Step 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

Initiate a loop test:
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 |

3. In the test loop, check that 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. To end the Loop Test, select End and Enter.

Performing a loop test using AMS Device Manager
Right click on the device and select Service Tools.
1. In the left navigation pane choose Simulate.
2. On the Simulate Tab find the Perform Loop Test button in the Analog Output Verification group box.
3. Follow the guided instructions and click Apply when complete.

Performing a loop test using the Local Operator Interface
Please reference the figure below to find the path to the Loop Test in the LOI menu.

Figure 6. Configuring the Tag with LOI

![Figure 6. Configuring the Tag with LOI](image-url)
Safety Instrumented Systems

Product Certifications

European Union Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on page 24. The latest revision of the Declaration is available at www.emersonprocess.com.

Ordinary Location Certification from FM Approvals

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

Hazardous Locations Certifications

North American Certifications

FM Approvals

Intrinsically Safe and Non-Incendive
Certificate No: 3044581

Markings (without enclosure):
INT. SAFE CL I, GP ABCD, T4
IS CL I Zone 0, AEX ia IIC; T4 Ga
NI CL I, DIV.2, GP ABCD
INSTALL PER DRAWINGS 00644-2071

Markings (with enclosure):
IS CL I,II,III, GP ABCDEFG T4
IS CL I Zone 0, AEX ia IIC; T4
NI CL I, DIV.2, GP ABCD
INSTALL PER DRAWINGS 00644-2071
ENCLOSURE TYPE 4X

Special Conditions for Safe Use (X)

- The surface resistivity of the non-metallic enclosure materials is greater than one gigaohm. Care must be taken to avoid electrostatic charge build-up. Do not rub or cleaned with solvents or a dry cloth.
- The Model 644 optional enclosures may contain aluminum and are 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.

Explosion-Proof and Dust Ignition Proof
Certificate No: 3006278
Markings: EXPLOSIONPROOF FOR CL. I, DIV. 1, GP BCD
DUST-IGNITIONPROOF FOR CL. II & III, DIV. 1, GP EFG
NON-INCENDIVE FOR CL. I, DIV 2, GP ABCD

WHEN INSTALLED PER ROSEMOUNT DRAWING 00644-1049
CONDUIT SEAL REQUIRED WITHIN 18 INCHES OF THE ENCLOSURE AT AMBIENT
TEMPERATURES BELOW -40 °C;
ENCLOSURE TYPE 4X

CSA International

I6 Intrinsically Safe
Certificate No.: 1091070
Applicable Standards: CSA Std. C22.2 No. 142 – M1987, CSA Std. C22.2 No. 157 – 92,
ANSI/ISA 12.27.02-2003

Markings (without enclosure):
Ex ia
CLASS I (GRPS A, B, C, D) CLASS I, ZONE 0, IIC
SUITABLE FOR CLASS I DIV 2, GROUPS A, B, C, D
INSTALL PER DRAWING 00644-2072.

Markings (with enclosure):
Ex ia
CLASS I, GRPS A,B,C,D, T4/T6, CLASS I, ZONE 0, IIC
WHEN INSTALL PER DRAWING 00644-1064 or 0644-2072
SUITABLE CLASS I DIV 2, WITH NON-INCENDIVE OUTPUT WHEN INSTALL PER
DRAWING 00644-2072
ENCLOSURE TYPE 4X

K6 Explosion-Proof, Dust Ignition Proof, Intrinsically Safe and Suitable for Class I Division 2
Certificate No.: 1091070
Applicable Standards: CSA Std. C22.2 No. 142 – M1987, CSA Std. C22.2 No. 30 –

Markings: CL I, DIV. 1, GRPS. B,C,D;
DUST-IGNITION PROOF, CL II, GRPS E,F, CL. III;
SUITABLE FOR CL I, DIV 2, GROUPS A,B,C,D
INSTALL PER DRAWING 00644-1059
ENCLOSURE TYPE 4X; CONDUIT SEAL NOT REQUIRED.

Ex ia
INTRINSICALLY SAFE, CLASS I, GROUPS A, B, C, D, T4/T5/T6 CLASS I, ZONE 0, IIC.
INSTALL PER DRAWING 00644-1064 or 00644-2072.
SUITABLE FOR CLASS I DIV 2, GROUPS A, B, C, D
INSTALL PER DRAWING 00644-2072.

European Certifications

I1 ATEX Intrinsic Safety
Certificate No.: Baseefa 12ATEX0101X
Markings: II 1 G, Ex ia IIC T6...T4 Ga;
See Certificate (Table 4)

CE 1180
Quick Start Guide

Special Conditions for Safe Use (X)

The apparatus must be installed in an enclosure which affords a degree of protection of at least IP20.

Non-metallic enclosures must have a surface resistance of less than 1Gohm. Light alloy or zirconium enclosures must be protected from impact and friction when installed.

Table 4. Input Parameters

<table>
<thead>
<tr>
<th>Loop</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$U_i = 30$ V</td>
<td>$I_a &lt; 60^\circ$</td>
</tr>
<tr>
<td></td>
<td>$I_i = 150$ mA</td>
<td>$I_a &lt; 70^\circ$</td>
</tr>
<tr>
<td></td>
<td>$P_i = 0.67$ W</td>
<td>$T_6 (-60^\circ \leq T_a \leq 40^\circ)$, $T_5 (-60^\circ \leq T_a \leq 50^\circ)$</td>
</tr>
<tr>
<td></td>
<td>$= 0.8$ W</td>
<td>$T_5 (-60^\circ \leq T_a \leq 40^\circ)$, $T_4 (-60^\circ \leq T_a \leq 80^\circ)$</td>
</tr>
<tr>
<td></td>
<td>$C_i = 3.3$ nF</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$L_i = 0$</td>
<td></td>
</tr>
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<table>
<thead>
<tr>
<th>Sensor</th>
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<tbody>
<tr>
<td></td>
<td>$U_o = 13.6$ V</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$I_o = 80$ mA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$P_o = 80$ mW</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$C_o = 0.44$ nF</td>
<td>$C_o = 0.816$ μF Group IIC</td>
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<tr>
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<td>$= 5.196$ μF Group IIB</td>
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<tr>
<td></td>
<td>$L_o = 5.79$ mH</td>
<td>$L_o = 5.196$ μF Group IIA</td>
</tr>
<tr>
<td></td>
<td>$= 23.4$ mH Group IIB</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$= 48.06$ mH Group IIA</td>
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N1 ATEX Type n (with enclosure)
Certification No.: BAS 00ATEX3145
Markings: II 3 G, Ex nA IIC T5 Gc (-40 °C ≤ T_a ≤ 70 °C)

Specific Conditions for Safe Use (X):

1. The apparatus is not capable of withstanding the 500 V insulation test required by Clause 6.8.1 of EN 60079-15:2005. This must be taken into account when installing the apparatus.

NC ATEX Type n (without enclosure)
Certificate No.: Baseefa12ATEX0102U
Markings: II 3 G, Ex nA IIC T6...T5 Gc
$V_{max} = 45$ volts max

Temperature Limitations – T6 (-60 °C ≤ T_a ≤ 40 °C), T5 (-60 °C ≤ T_a ≤ 85 °C)

Special Conditions for Safe Use (x):

The component 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, IEC 60079-0 & EN 60079-15.
E1  ATEX Flameproof (Enclosure options J5-J8, and R1-R4)
Certification No.: KEMA 99ATEX8715X
Markings:  II 2 G, Ex d IIC T6 Gb (-50°C ≤ Ta ≤ 65°C)

Special Conditions for Safe Use (X):
For information on the dimensions of the flameproof joints the manufacture shall be contacted.

E1  ATEX Flameproof (Enclosure options J1-J4)
Certificate No.: FM12ATEX0065X
Markings:  II 2 G, Ex d IIC T6 Gb (-50 °C ≤ Ta ≤ 60 °C)

Special Conditions for Safe Use (X):
1. The Model 644 optional housings may contain 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. Consult the manufacturer if dimensional information on the flameproof joints is necessary.

ND ATEX Dust (Enclosure options J5-J8, and R1-R4)
Certification No.: KEMA 99ATEX8715X
Applicable Standards: EN 61241-0:2006, EN 61241-1:2004
Markings: II 1 D, Ex tD A20 IP66 T95°C

Special Conditions for Safe Use (X): None

ND ATEX Dust (Enclosure options J1-J4)
Certificate No.: FM12ATEX0065X
Markings:  II 2 D, Ex tb IIIC T95 Db (-40 °C ≤ Ta ≤ 70 °C)

Special Conditions for Safe Use (X):
1. The Model 644 optional housings may contain 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. Consult the manufacturer if dimensional information on the flameproof joints is necessary.

IECEX Certifications
I7  IECEX Intrinsic Safety
Certificate No.: IECEx BAS 12.0069X
Markings: Ex ia IIC T6...T4 Ga
See Certificate (Table 4)

Special Conditions for Safe Use (X)
The apparatus must be installed in an enclosure which affords a degree of protection of at least IP20
Non-metallic enclosures must have a surface resistance of less than 1Gohm
Light alloy or zirconium enclosures must be protected from impact and friction when installed.

N7 IECEx Type n (with enclosure)
Certification No.: IECEx BAS 07.0055
Markings: Ex nL IIC T5 Gc (-40 °C ≤ Ta ≤ 70 °C)

NG IECEx Type n (without enclosure)
Certificate No.: IECEx BAS 12.0070U
Markings: Ex nA IIC T6…T5 Gc
Vmax = 45 volts max

Temperature limitations – T6 (-60 °C ≤ Ta ≤ 40 °C), T5 (-60 °C ≤ Ta ≤ 85 °C)

Special Conditions for Safe Use (X):
The component must be installed in a suitable certified enclosure such that it is afforded a degree of protection of at least IP54 in accordance with IEC 60529, IEC 60079-15, and IEC 60079-15.

E7 IECEx Flameproof (Enclosure options J5-J8, and R1-R4)
Certification No.: IECEx KEM 09.0015X
Markings: Ex d IIC T6 Gb (-40 °C ≤ Ta ≤ 65 °C)

Special Conditions for Safe Use (X):
For information on the dimensions of the flameproof joints the manufacture shall be contacted.

E7 IECEx Flameproof (Enclosure options J1-J4)
Certificate No.: IECEx FMG12.0022X
Markings: Ex d IIC T6 Gb (-50 °C ≤ Ta ≤ 60 °C)

Special Conditions for Safe Use (X):
1. The Rosemount 644 optional housings may contain 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. Consult the manufacturer if dimensional information on the flameproof joints is necessary.

NK IECEx Dust (Enclosure options J5-J8, and R1-R4)
Certificate No.: IECEx KEM 09.0015X
Markings: Ex tD A20 IP66 T95°C

Special Conditions for Safe Use (X): None

NK ATEX Dust (Enclosure options J1-J4)
Certificate No.: IECEx FMG12.0022X
Markings: Ex tb IIIC T95 Db (-40 °C ≤ Ta ≤ 70 °C)

Special Conditions for Safe Use (X):
1. The Rosemount 644 optional housings may contain 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. Consult the manufacturer if dimensional information on the flameproof joints is necessary.

**Combinations of Certifications**

Stainless steel certification tag is provided when optional approval is specified. Once a device labeled with multiple approval types is installed, it should not be reinstalled using any other approval types. Permanently mark the approval label to distinguish it from unused approval types.

- K1 Combination of E1, I1, N1, and ND
- K5 Combination of E5 and I5
- K6 Combination of E6 and I6
- K7 Combination of E7, I7, N7, and N7
- KA Combination of E1, I1, E6, and I6
- KB Combination of E5, I5, I6, and E6
- KC Combination of E5, E1, I5, and I1
- KD Combination of E5, E1, I5, and I1

**Other Certifications**

**Shipboard**

SBS American Bureau of Shipping (ABS)
Certificate No.: 00-HS145383/1-PDA
Applicable Standards: ABS Rules: 2008 Steel Vessels Rules 1-1-4/7.7, 4-8-3/1.7
Intended Service: Measurement of Pressure, Flow and Level for Liquid, Gas and Vapor Applications on ABS Classed Vessels, Marine and Offshore Installations
Quick Start Guide

Figure 7. Rosemount 644 EC Declaration of Conformity

EC Declaration of Conformity
No: RMD 1016 Rev. J

We,

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

declare under our sole responsibility that the product,

Models 644 Smart Temperature Transmitter (Hart & Fieldbus)

manufactured by,

Rosemount Inc.
12001 Technology Drive and
Eden Prairie, MN 55344-3695
USA

and

Rosemount Inc.
8200 Market Boulevard
Chanhassen, MN 55317-9687
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.

__________________________
(Kelly Klein)
(signature)

__________________________
(Director Global Quality)
(function- printed)

Kelly Klein
(name-printed)

__________________________
(10 Oct 2012)
(date of issue)
### Schedule

**EC Declaration of Conformity RMD 1016 Rev. J**

|-----------------------------|------------|

<table>
<thead>
<tr>
<th>ATEX Directive (94/9/EC)</th>
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</thead>
<tbody>
<tr>
<td>Model 644 DIN A Head Mount Temperature Transmitter (Analog/HART Output)</td>
</tr>
<tr>
<td><strong>Baseefa12ATEX0101X – Intrinsic Safety Certificate</strong></td>
</tr>
<tr>
<td>Equipment Group II, Category 1 G (Ex ia IIC T6...T4 Ga)</td>
</tr>
<tr>
<td>Harmonized Standards: EN60079-11: 2012</td>
</tr>
<tr>
<td>Other Standards: IEC60079-0:2011 (This standard represents “State of the Art”. The EN version of this standard is expected to be harmonized shortly)</td>
</tr>
</tbody>
</table>

| **Baseefa12ATEX0102U – Type n Component Certificate** |
| Equipment Group II, Category 3 G (Ex nA IIC T6…T5 Gc) |
| Harmonized Standards: EN60079-15: 2010 |
| Other Standards: IEC60079-0:2011 (This standard represents “State of the Art”. The EN version of this standard is expected to be harmonized shortly) |

| Model 644 DIN A Head Mount Temperature Transmitter (Fieldbus Output) |
| **Baseefa03ATEX0499X – Intrinsic Safety Certificate** |
| Equipment Group II, Category 1 G (Ex ia IIC T4 Ga) |
| Harmonized Standards: EN60079-11: 2007 |
| Other Standards: EN60079-0:2006 (A review against EN60079-0:2009, which is harmonized, shows no significant changes relevant to this equipment so EN60079-0:2006 continues to represent “State of the Art”.) |

| **BAS99ATEX3084U – Type n Component Certificate** |
| Equipment Group II, Category 3 G (Ex nL IIC T5 Gc) |
| Harmonized Standards: EN60079-15: 2005 |
| Other Standards: EN60079-0:2006 (A review against EN60079-0:2009, which is harmonized, shows no significant changes relevant to this equipment so EN60079-0:2006 continues to represent “State of the Art”.) |
Quick Start Guide

Model 644 DIN A Head Mount Temperature Transmitter
(Enclosure Options J5, J6, J7, J8, R1, R2, R3, or R4)

KEMA 99ATEX8715X – Flameproof Certificate
Equipment Group II, Category 2 G (Ex d IIC T6 Gb)
Harmonized Standards: EN60079-1: 2007
Other Standards: EN60079-0:2006 (A review against EN60079-0:2009, which is harmonized, shows no significant changes relevant to this equipment so EN60079-0:2006 continues to represent “State of the Art”)

KEMA 99ATEX8715X – Dust Certificate
Equipment Group II, Category 1 D (Ex tD A20 IP66 T95°C)
Harmonized Standards
Other Standards: EN61241-0:2006, EN61241-1:2004 (A review against EN60079-0:2009, and EN60079-31, which are harmonized, shows no significant changes relevant to this equipment so EN61241-0:2006, EN61241-1:2004 continue to represent “State of the Art”)

Model 644 DIN A Head Mount Temperature Transmitter
(Enclosure Options J1, J2, J3, or J4)

FMG12ATEX0065X – Flameproof Certificate
Equipment Group II, Category 2 G (Ex d IIC T6 Gb)

FMG12ATEX0065X – Dust Certificate
Equipment Group II, Category 2 D (Ex tb IIC T95°C Db)
Harmonized Standards: EN60079-0:2009, and EN60079-31:2009

Model 644 DIN A Head Mount Temperature Transmitter (All Models)

BAS00ATEX3145 – Type n Certificate
Equipment Group II, Category 3 G (Ex nL IIC T5)
Harmonized Standards: EN60079-15: 2005
Other Standards: EN60079-0:2006 (A review against EN60079-0:2009, which is harmonized, shows no significant changes relevant to this equipment so EN60079-0:2006 continues to represent “State of the Art”).
Models 644R Rail Mount Temperature Transmitters (Hart)

**BAS80ATEX1033X – Intrinsic Safety Certificate**
- Equipment Group II, Category 1 G (Ex ia IIC T4 Ga)
- Harmonized Standards: EN60079-11: 2007
- Other Standards: EN60079-0:2006 (A review against EN60079-0:2009, which is harmonized, shows no significant changes relevant to this equipment so EN60079-0:2006 continues to represent “State of the Art”.)

**BAS99ATEX3084U – Type n Component Certificate**
- Equipment Group II, Category 3 G (Ex nL IIC T5 Gc)
- Harmonized Standards: EN60079-15: 2005
- Other Standards: EN60079-0:2006 (A review against EN60079-0:2009, which is harmonized, shows no significant changes relevant to this equipment so EN60079-0:2006 continues to represent “State of the Art”.)
## ATEX Notified Bodies for EC Type Examination Certificate

- **Baseefa** [Notified Body Number: 1180]
  Rockhead Business Park, Staden Lane
  Buxton, Derbyshire SK17 9JN
  United Kingdom

- **DEKRA Certification B.V.** [Notified Body Number: 0344]
  Utrechtseweg 330, 6812 AR Arnhem
  P.O. Box 5185, 6802 ED Arnhem
  The Netherlands
  Postbank 6794687

- **FM Approvals Ltd.** [Notified Body Number: 1725]
  1 Windsor Dials
  Windsor, Berkshire, SL4 1RS
  United Kingdom

## ATEX Notified Body for Quality Assurance

- **Baseefa** [Notified Body Number: 1180]
  Rockhead Business Park, Staden Lane
  Buxton, Derbyshire SK17 9JN
  United Kingdom