

Rosemount™ 644 Rail Mount Temperature Transmitter

with RK Option and HART® 7 Protocol



Contents

About this guide.....	3
System readiness.....	6
Transmitter installation.....	7
Configuration.....	13
Transmitter installation.....	16
Safety instrumented systems.....	19
Product certifications.....	20
China RoHS.....	33

1 About this guide

This guide provides basic guidelines for installing the Rosemount 644R Rail Mount Temperature Transmitter. It does not provide instructions for detailed configuration, diagnostics, maintenance, service, troubleshooting, or installation. Refer to the [Rosemount 644R Rail Mount Reference Manual](#) for more instructions. The manual and this guide are also available electronically on [Emerson.com](https://www.emerson.com).

Safety messages

⚠ WARNING

Follow instructions

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

Ensure only qualified personnel perform the installation.

Physical access

Unauthorized personnel may potentially cause significant damage to and/or misconfiguration of end users' equipment. This could be intentional or unintentional and needs to be protected against.

Physical security is an important part of any security program and fundamental in protecting your system. Restrict physical access by unauthorized personnel to protect end users' assets. This is true for all systems used within the facility.

⚠ WARNING**Explosions**

Explosions could result in death or serious injury.

Installation of the transmitters in a hazardous environment must be in accordance with the appropriate local, national, and international standards, codes, and practices. Kindly review the Product Certifications section for any restrictions associated with a safe installation.

Do not remove the connection head cover in explosive atmospheres when the circuit is live.

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

All connection head covers must be fully engaged to meet explosion-proof requirements.

Process leaks

Process leaks could result in death or serious injury.

Do not remove the thermowell while in operation.

Before applying pressure, install and tighten thermowells and sensors.

Electrical shock

Electrical shock could cause death or serious injury.

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

⚠ CAUTION**Conduit/cable entries**

Unless otherwise marked, the conduit/cable entries in the housing enclosure use a ½-14 NPT form. Only use plugs, adapters, glands, or conduit with a compatible thread form when closing these entries.

Entries marked "M20" are M20 x 1.5 thread form.

When installing in a hazardous location, use only appropriately listed or Ex-certified plugs, glands, or adapters in cable/conduit entries.

NOTICE

The products described in this document are NOT designed for nuclear-qualified applications.

Using non-nuclear qualified products in applications that require nuclear-qualified hardware or products may cause inaccurate readings.

For information on Emerson nuclear-qualified products, contact your local Emerson Sales Representative.

2 System readiness

2.1 Confirm HART® revision capability

If using HART-based control or AMS, 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 is a HART Revision 7 device.

2.2 Confirm correct device driver

- Verify the latest Device Driver files are loaded on your systems to ensure proper communications.
- Download the latest Device Driver at [Software and Drivers](#).

3 Transmitter installation

3.1 Safety messages

Instructions and procedures in this section may require special precautions to ensure the safety of the personnel performing the operations. Information that potentially raises safety issues is indicated by a warning symbol.



Please refer to the following safety messages before performing an operation preceded by this symbol.

▲ WARNING

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

Ensure only qualified personnel perform the installation.

Explosions could result in death or serious injury.

Do not remove the housing covers in explosive atmospheres when the circuit is live.

Before connecting a handheld communicator in an explosive atmosphere, ensure that the instruments are installed in accordance with intrinsically safe or non-incendive field wiring practices.

Verify that the operating atmosphere of the transmitter is consistent with the appropriate hazardous locations certifications.

All connection head covers must be fully engaged to meet explosion-proof requirements.

Process leaks could result in death or serious injury.

Do not remove the thermowell while in operation.

Before applying pressure, install and tighten thermowells and sensors.

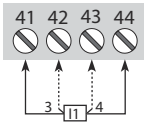
Electrical shock could cause death or serious injury.

Use extreme caution when making contact with the leads and terminals.

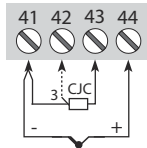
3.2 Connections

Single input connection

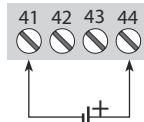
2-wire / 3-wire /
4-wire RTD or
lin. R



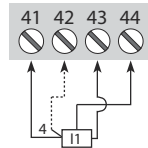
Thermocouple
(TC) (internal CJC
or external 2-
wire / 3-wire / 4-
wire CJC)⁽¹⁾



mV



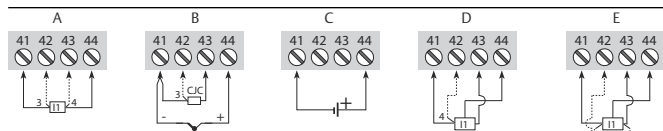
3-wire / 4-wire
potentiometer



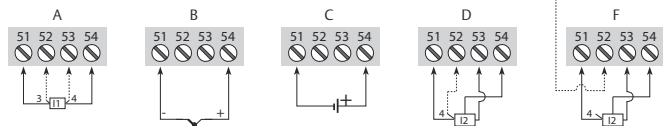
- (1) When using thermocouple input, you can configure the transmitter for either constant, internal, or external CJC via a Pt100 or Ni100 sensor. You must select the input during device configuration.

Dual input connection

Input 1



Input 2

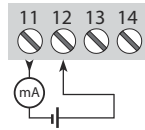


- A. 2 w / 3 w / 4 w RTD or lin. R
- B. TC (internal CJC or external 2 w / 3 w / 4 w CJC)⁽¹⁾
- C. mV
- D. 3 w / 4 w potentiometer
- E. 5 w potentiometer
- F. 3 w potentiometer

- (1) When using thermocouple input, you can configure the transmitter for either constant, internal, or external CJC via a Pt100 or Ni100 sensor. You must select the input during device configuration.

Output

2-wire installation



3.3 Multidrop mode

Communication with up to 63 uniquely numbered transmitters in parallel on a digital HART® 2-wire system can be facilitated using either a HART communicator or a HART modem connected across terminals BC or CD, requiring transmitters to be in multidrop mode with a 4 mA signal and a total loop current not exceeding 252 mA.

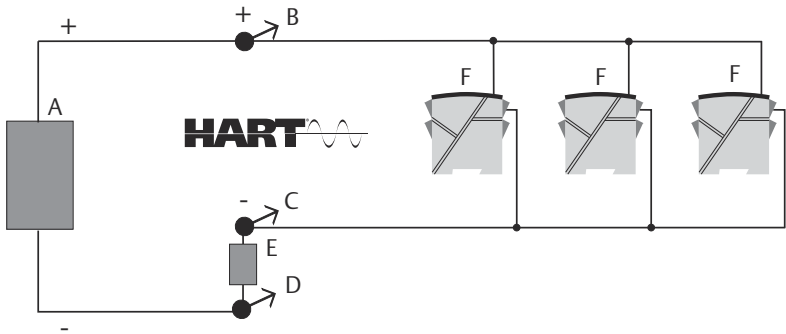
The communication is either by means of a HART communicator or a HART modem.

You can connect the HART communicator or a HART modem across BC or CD.

The outputs of a maximum of 63 transmitters can be connected in parallel for a digital HART 2-wire communication.

Before connecting each transmitter, configure it with a unique number from 1 to 63. If two transmitters are configured with the same number, both will be excluded. Program the transmitters for Multidrop mode (with a fixed output signal of 4 mA). Maximum current in the loop is therefore 252 mA.

Figure 3-1: Multidrop connection



- A. Power supply
- B. Connection
- C. Connection
- D. Connection
- E. $250 \Omega < R_{load} < 1100 \Omega$
- F. Transmitter

3.4 Reinstall terminal connectors

You can remove the terminal connectors to install sensor and power wiring.

To reinstall terminal connectors:

Procedure

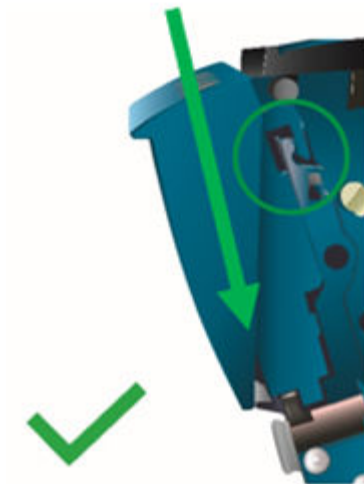
1. Align the terminal connectors with the internal pins.



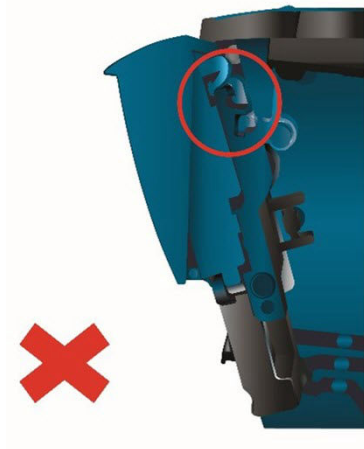
2. Rotate the plastic hooks so that they are properly engaged in the supporting plastic piece.



3. Push down the terminal connector to properly set it into place.



Improper seating can cause the hooks to wedge against the supporting plastic and cause the connector to unseat.



4 Configuration

4.1 Safety messages

Instructions and procedures in this section may require special precautions to ensure the safety of the personnel performing the operations. Information that potentially raises safety issues is indicated by a warning symbol.



Please refer to the following safety messages before performing an operation preceded by this symbol.

▲ WARNING

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

Ensure only qualified personnel perform the installation.

Explosions could result in death or serious injury.

Do not remove the housing covers in explosive atmospheres when the circuit is live.

Before connecting a handheld communicator in an explosive atmosphere, ensure that the instruments are installed in accordance with intrinsically safe or non-incendive field wiring practices.

Verify that the operating atmosphere of the transmitter is consistent with the appropriate hazardous locations certifications.

All connection head covers must be fully engaged to meet explosion-proof requirements.

Process leaks could result in death or serious injury.

Do not remove the thermowell while in operation.

Before applying pressure, install and tighten thermowells and sensors.

Electrical shock could cause death or serious injury.

Use extreme caution when making contact with the leads and terminals.

4.2 Configuration methods

You can configure the transmitter using a HART® communicator with Emerson's DDL driver or through a programming framework like AMS Device Manager or PACTware, both requiring product-specific software support from sources such as the FieldComm Group or Emerson.

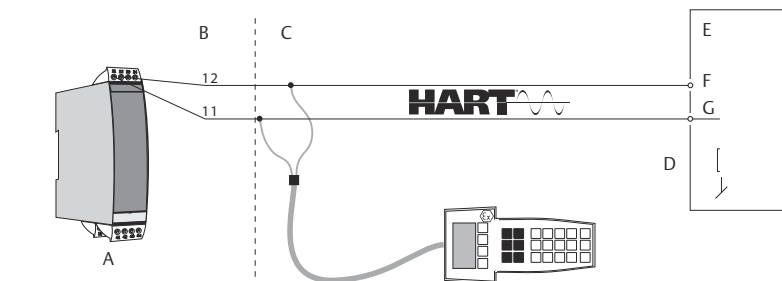
You can configure the transmitter in the following ways:

- Using a HART® communicator with Emerson's DDL driver
- Via programming framework (such as AMS Device Manager, distributed control system (DCS), PACTware™)

HART communicator

To get access to product-specific commands, load the HART communicator with Emerson's DDL driver. You can order this through either the FieldComm Group or Emerson.

Figure 4-1: HART communicator



- A. Transmitter
- B. Ex area
- C. Safe area
- D. $250 \Omega < R_{load} < 1100 \Omega$
- E. Receiving equipment
- F. +V supply
- G. Input

Programming framework

There is support for both EDD and FDT®/DTM™ technology, offering configuration and monitoring via relevant DCS/AMS and supported management packages (such as PACTware).

Figure 4-2: Programming framework



- A. Transmitter
- B. $250 \Omega < R_{load} < 1100 \Omega$
- C. Process computer
- D. DCS, etc.

5 Transmitter installation

5.1 Rail mount transmitter with remote mount sensor

The basic assembly configuration consists of a remote-mounted transmitter, an integral mount sensor with terminal block, an integral style connection head, a standard extension, and a threaded thermowell.

The most basic assembly uses:

- Remote mounted transmitter
- Integral mount sensor with terminal block
- Integral style connection head
- Standard extension
- Threaded thermowell

Refer to the [Rosemount DIN-Style Temperature Sensors and Thermowells \(Metric\) Product Data Sheet](#) for complete sensor and mounting accessory information.

5.1.1 Assemble the device

The procedure involves mounting the transmitter, installing the thermowell, attaching the sensor to the connection head, connecting sensor lead wires, ensuring enclosure covers are fully engaged for safety, and running wires from the sensor assembly to the transmitter while avoiding contact with leads and terminals.

Procedure

1. Attach the transmitter to a suitable rail or panel.
2. Attach the thermowell to the pipe or process container wall. Install and tighten the thermowell before applying pressure.
3. Attach the sensor to the connection head and mount the entire assembly to the thermowell.
4. Attach sufficient lengths of sensor lead wire to the sensor terminal block.
5. Attach and tighten the connection head cover.

⚠ WARNING

Enclosure covers must be fully engaged to meet explosion-proof requirements.

6. Run sensor lead wires from the sensor assembly to the transmitter.
7. Attach the sensor and power leads to the transmitter.

NOTICE

Avoid contact with leads and terminals.

5.2 Rail mount transmitter with threaded sensor

The most basic temperature sensor assembly consists of a threaded sensor with flying leads, a threaded connection head, a union and nipple extension, and a threaded thermowell.

The least complicated assembly uses:

- Threaded sensor with flying heads
- Threaded sensor connection head
- Union and nipple extension assembly
- Threaded thermowell

Refer to [Rosemount DIN-Style Temperature Sensors and Thermowells \(Metric\) Product Data Sheet](#) for complete sensor and mounting accessory information.

5.2.1 Assemble the device

To install the temperature sensor assembly, mount the transmitter, secure the thermowell, connect the sensor to the thermowell and connection head, wire the sensor to the transmitter, and ensure all covers are properly engaged to meet safety standards.

Procedure

1. Attach the transmitter to a suitable rail or panel.
2. Before applying pressure, attach the thermowell to the pipe or process container wall. Install and tighten the thermowell.
3. Attach necessary extension nipples and adapters. Seal the nipple and adapter threads with silicone tape.
4. Twist the sensor into the thermowell. If required, install drain seals for severe environments or to satisfy code requirements.
5. Screw the connection head to the sensor.
6. Attach the sensor lead wires to the connection head terminals.
7. Attach additional sensor lead wires from the connection head to the transmitter.

8. Attach and tighten the connection head cover.

Tip

Enclosure covers must be fully engaged to meet explosion-proof requirements.

9. Attach the sensor and power leads to the transmitter.

NOTICE

Avoid contact with leads and terminals.

6 Safety instrumented systems

For safety-certified installations, refer to the [Rosemount 644R Rail Mount Temperature Transmitter Reference Manual](#).

The manual is available electronically at [Emerson.com](#) or by contacting an Emerson representative.

7 Product certifications

7.1 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/global](https://www.emerson.com/global).

7.2 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).

7.3 Installing equipment in North America

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

7.4 USA

7.4.1 I5 USA Intrinsically Safe (IS) and Division 2/Zone 2

Certificate 80072530

Markings Class I, Division 1, Groups A, B, C, D
 Class I, Zone 0: AEx ia IIC T6...T4
 Class I, Zone 1: AEx ib [ia] IIC T6...T4
 Class I, Division 2, Groups A, B, C, D
 Class I, Zone 2: AEx nA IIC T6...T4
 Class I, Zone 2: AEx nA [ic] IIC T6...T4
 when installed per Control Drawing 00644-8000

Table 7-1: IS input parameters vs. temperature range

Input parameters (Terminals 11, 12)	Temperature range	Input parameters (Terminals 11, 12)	Temperature range
U _i : 30 Vdc	T4: -50 °C ≤ T _a ≤ +85 °C	U _i : 30 Vdc	T4: -50 °C ≤ T _a ≤ +85 °C
I _i : 120 mA	T5: -50 °C ≤ T _a ≤ +70 °C	I _i : 100 mA	T5: -50 °C ≤ T _a ≤ +75 °C

Table 7-1: IS input parameters vs. temperature range (continued)

Input parameters (Terminals 11, 12)	Temperature range	Input parameters (Terminals 11, 12)	Temperature range
P _i : 900 mW	T6: -50 °C ≤ T _a ≤ +55 °C	P _i : 750 mW	T6: -50 °C ≤ T _a ≤ +60 °C
L _i : 0 uH	N/A	L _i : 0 uH	N/A
C _i : 1.0 nF	N/A	C _i : 1.0 nF	N/A

Table 7-2: IS output parameters per terminal configuration

Parameters	One sensor using all output terminals (41-54)	Sensor using one set of output terminals (41-44 or 51-54)
U _o	7.2 Vdc	7.2 Vdc
I _o	12.9 mA	7.3 mA
P _o	23.3 mW	13.2 mW
L _o	200 mH	667 mH
C _o	13.5 uF	13.5 uF

Table 7-3: Division 2/Zone 2 input parameters vs. temperature range

Supply voltage	Temperature range
37 Vdc maximum	T4: -50 °C ≤ T _a ≤ +85 °C T5: -50 °C ≤ T _a ≤ +70 °C T6: -50 °C ≤ T _a ≤ +55 °C
30 Vdc maximum	T4: -50 °C ≤ T _a ≤ +85 °C T5: -50 °C ≤ T _a ≤ +75 °C T6: -50 °C ≤ T _a ≤ +60 °C
NIFW V _{max} = 30 Vdc, C _i = 1 nF, L _i = 0	T4: -50 °C ≤ T _a ≤ +85 °C T5: -50 °C ≤ T _a ≤ +75 °C T6: -50 °C ≤ T _a ≤ +60 °C

Special Conditions for Safe Use (X):

1. Install per Installation Drawing 00644-8000 as appropriate.
2. Install in accordance with the US National Electrical Code (NEC) for the US and in accordance with the Canadian Electrical Code (CEC) for Canada.

3. The transmitter must be installed in suitable enclosure to meet installation codes stipulated in the Canadian Electrical Code (CEC) or for the US the National Electrical Code (NEC).
4. If the enclosure is made of non-metallic materials or of painted metal, electrostatic charging shall be avoided.
5. For Div 2/Zone 2 applications, the transmitter must be installed in an enclosure providing a degree of protection of at least IP54 according to IEC60529 that is suitable for the application and is correctly installed. Cable entry devices and blanking elements shall fulfil the same requirements.
6. Use supply wires with a rating of at least 5 K above the ambient temperature.
7. For Div 2/Zone 2 applications, the temperature transmitter requires connecting to Class 2 power supply with transient protection. See installation drawing as appropriate.

7.5 Canada

7.5.1 I6 Canada Intrinsically Safe (IS) and Division 2/Zone 2

Certificate: 80072530

Markings: Class I, Division 1, Groups A, B, C, D

Ex ia IIC T6...T4

Ex ib [ia] IIC T6...T4

Class I, Division 2, Groups A, B, C, D

Ex nA IIC T6...T4

Ex nA [ic] IIC T6...T4

when installed per Control Drawing 00644-8000

Table 7-4: IS input parameters vs. temperature range

Input parameters (Terminals 11, 12)	Temperature range	Input parameters (Terminals 11, 12)	Temperature range
U_i : 30 Vdc	T4: $-50\text{ °C} \leq T_a \leq +85\text{ °C}$	U_i : 30 Vdc	T4: $-50\text{ °C} \leq T_a \leq +85\text{ °C}$
I_i : 120 mA	T5: $-50\text{ °C} \leq T_a \leq +70\text{ °C}$	I_i : 100 mA	T5: $-50\text{ °C} \leq T_a \leq +75\text{ °C}$
P_i : 900 mW	T6: $-50\text{ °C} \leq T_a \leq +55\text{ °C}$	P_i : 750 mW	T6: $-50\text{ °C} \leq T_a \leq +60\text{ °C}$
L_i : 0 uH	N/A	L_i : 0 uH	N/A

Table 7-4: IS input parameters vs. temperature range (continued)

Input parameters (Terminals 11, 12)	Temperature range	Input parameters (Terminals 11, 12)	Temperature range
C _i : 1.0 nF	N/A	C _i : 1.0 nF	N/A

Table 7-5: IS output parameters per terminal configuration

Parameters	One sensor using all output terminals (41-54)	Sensor using one set of output terminals (41-44 or 51-54)
U _o	7.2 Vdc	7.2 Vdc
I _o	12.9 mA	7.3 mA
P _o	23.3 mW	13.2 mW
L _o	200 mH	667 mH
C _o	13.5 uF	13.5 uF

Table 7-6: Division 2/Zone 2 input parameters vs. temperature range

Supply voltage	Temperature range
37 Vdc maximum	T4: -50 °C ≤ T _a ≤ +85 °C T5: -50 °C ≤ T _a ≤ +70 °C T6: -50 °C ≤ T _a ≤ +55 °C
30 Vdc maximum	T4: -50 °C ≤ T _a ≤ +85 °C T5: -50 °C ≤ T _a ≤ +75 °C T6: -50 °C ≤ T _a ≤ +60 °C
NIFW V _{max} = 30 Vdc, C _i = 1 nF, L _i = 0	T4: -50 °C ≤ T _a ≤ +85 °C T5: -50 °C ≤ T _a ≤ +75 °C T6: -50 °C ≤ T _a ≤ +60 °C

Special Conditions for Safe Use (X):


1. Install per Installation Drawing 00644-8000 as appropriate.
2. Install in accordance with the US National Electrical Code (NEC) for the US and in accordance with the Canadian Electrical Code (CEC) for Canada.
3. The transmitter must be installed in suitable enclosure to meet installation codes stipulated in the Canadian Electrical Code (CEC) or for the US the National Electrical Code (NEC).

4. If the enclosure is made of non-metallic materials or of painted metal, electrostatic charging shall be avoided.
5. For Div 2/Zone 2 applications, the transmitter must be installed in an enclosure providing a degree of protection of at least IP54 according to IEC60529 that is suitable for the application and is correctly installed. Cable entry devices and blanking elements shall fulfil the same requirements.
6. Use supply wires with a rating of at least 5 K above the ambient temperature.
7. For Div 2/Zone 2 applications, the temperature transmitter requires connecting to Class 2 power supply with transient protection. See installation drawing as appropriate.

7.6 Europe

7.6.1 I1 ATEX Intrinsic Safety

Certificate DEKRA 21ATEX0003X

Markings  II 1 G Ex ia IIC T6...T4 Ga
 II 2(1) G Ex ib [ia Ga] IIC T6...T4 Gb
 II 2 D Ex ia IIIC Db
 I 1 M Ex ia I Ma

when installed per Control Drawing 00644-8001

Input parameters (power terminals)	One sensor using all output terminals (41-54)	Sensor using one set of output terminals (41-44 or 51-54)
U _i : 30 Vdc	7.2 Vdc	7.2 Vdc
I _i : 120 mA	12.9 mA	7.3 mA
P _i : (See table below)	23.3 mW	13.2 mW
L _i : 0 uH	200 mH	667 mH
C _i : 1.0 nF	13.5 uF	13.5 uF

P _i per Channel	Temperature class	Maximum ambient temperature
900 mW	T6	+50 °C
	T5	+65 °C
	T4	+85 °C
750 mW	T6	+55 °C


Pi per Channel	Temperature class	Maximum ambient temperature
	T5	+70 °C
	T4	+85 °C
610 mW	T6	+60 °C
	T5	+75 °C
	T4	+85 °C

Special Conditions for Safe Use (X):

1. For all potentially explosive atmospheres, if the enclosure is made of non-metallic materials, or if it is made of metal having a paint layer thicker than 0.2 mm (group IIC), or 2 mm (group IIB, IIA, I), or any thickness (group III), electrostatic charges shall be avoided.
2. For EPL Ga, if the enclosure is made of aluminum, it must be installed such that ignition sources due to impact and friction sparks are excluded.
3. For EPL Db, the surface temperature “T” of the enclosure, for a dust layer with a maximum thickness of 5 mm, is the ambient temperature +20 K.

7.6.2 N1 ATEX Zone 2

Certificate DEKRA 21ATEX0004X

Markings  II 3 G Ex nA IIC T6...T4 Gc
 II 3 G Ex ec IIC T6...T4 Gc
 II 3 G Ex ic IIC T6...T4 Gc
 II 3 D Ex ic IIIC Dc

Note

When installed per Control Drawing 00644-8001.

Table 7-7:

Supply/input to transmitter			Temperature class	Maximum ambient temperature
Ex nA & Ex ec	Ex ic $L_i = 0 \mu\text{H}$ $C_i = 1.0 \text{ nF}$	Ex ic $U_i = 48 \text{ Vdc}$ $L_i = 0 \mu\text{H}$ $C_i = 1.0 \text{ nF}$		Single and dual input
$V_{\text{max}} = 37 \text{ Vdc}$	$U_i = 37 \text{ Vdc}$	$P_i = 851 \text{ mW}$ per channel	T4	185 °F (85 °C)
			T5	158 °F (70 °C)
			T6	131 °F (55 °C)
$V_{\text{max}} = 30 \text{ Vdc}$	$U_i = 30 \text{ Vdc}$	$P_i = 700 \text{ mW}$ per channel	T4	185 °F (85 °C)
			T5	167 °F (75 °C)
			T6	140 °F (60 °C)

Table 7-8: Maximum output of transmitter

Ex nA & Ex ec	One sensor using all output terminals (41-54)	Sensor using one set of output terminals (41-44 or 51-54)
$V_{\text{max}} = 7.2 \text{ Vdc}$	7.2 Vdc 12.9 mA 23.3 mW 200 mH 13.5 uF	7.2 Vdc 7.3 mA 13.2 mW 667 mH 13.5 uF

Special Conditions for Safe Use (X):

1. For all potentially explosive atmospheres, if the enclosure is made of non-metallic materials, or if it is made of metal having a paint layer thicker than 0.00787402 in. (0.2 mm) (Group IIC), or 0.07874016 in. (2 mm) (Group IIB, IIA, I), or any thickness (Group III), electrostatic charges shall be avoided.
2. The transmitter shall be installed in an enclosure providing a degree of protection of not less than IP54, in accordance with EN 60079-0, which is suitable for the application and correctly installed, e.g., in an enclosure that is in type of protection Ex n or Ex e.
3. Additionally, for Ex nA or Ex ec, the area inside the enclosure shall be pollution degree 2 or better, as defined in EN 60664-1.

4. For EPL Dc, the surface temperature “T” of the enclosure, for a dust layer with a maximum thickness of 0.19685039 in. (5 mm), is the ambient temperature +20K.

7.7 International

7.7.1 I7 IECEx Intrinsic Safety

Certificate IECEx DEK 21.0002X

Markings Ex ia IIC T6...T4 Ga
 Ex ib [ia Ga] IIC T6...T4 Gb
 Ex ia IIIC Db
 Ex ia I Ma

Note

When installed per Control Drawing 00644-8002.

Input parameters (power terminals)	One sensor using all output terminals (41-54)	Sensor using one set of output terminals (41-44 or 51-54)
U _i : 30 Vdc	7.2 Vdc	7.2 Vdc
I _i : 120 mA	12.9 mA	7.3 mA
P _i : (See table below)	23.3 mW	13.2 mW
L _i : 0 uH	200 mH	667 mH
C _i : 1.0 nF	13.5 uF	13.5 uF

Pi per channel	Temperature class	Maximum ambient temperature
900 mW	T6	122 °F (50 °C)
	T5	149 °F (65 °C)
	T4	185 °F (85 °C)
750 mW	T6	131 °F (55 °C)
	T5	158 °F (70 °C)
	T4	185 °F (85 °C)
610 mW	T6	140 °F (60 °C)
	T5	167 °F (75 °C)
	T4	185 °F (85 °C)

Special Conditions for Safe Use (X):

1. For all potentially explosive atmospheres, if the enclosure is made of non-metallic materials, or if it is made of metal having a paint layer thicker than 0.00787402 in. (0.2 mm) (Group IIC), or 0.07874016 in. (2 mm) (Group IIB, IIA, I), or any thickness (Group III), electrostatic charges shall be avoided.
2. For EPL Ga, if the enclosure is made of aluminum, it must be installed such that ignition sources due to impact and friction sparks are excluded.
3. For EPL Db, the surface temperature “T” of the enclosure, for a dust layer with a maximum thickness of 0.19685039 in. (5 mm), is the ambient temperature +20 K.

7.7.2 N7 IECEx Zone 2

Certificate IECEx DEK 21.0002X

Markings Ex nA IIC T6...T4 Gc
 Ex ec IIC T6...T4 Gc
 Ex ic IIC T6...T4 Gc
 Ex ic IIIC Dc

Note

When installed per Control Drawing 00644-8002.

Table 7-9:

Supply/input to transmitter			Temperature class	Maximum ambient temperature
Ex nA & Ex ec	Ex ic L _i = 0 μH C _i = 1.0 nF	Ex ic U _i = 48 Vdc L _i = 0 μH C _i = 1.0 nF		Single and dual input
V _{max} = 37 Vdc	U _i = 37 Vdc	P _i = 851 mW per channel	T4	185 °F (85 °C)
			T5	158 °F (70 °C)
			T6	131 °F (55 °C)
V _{max} = 30 Vdc	U _i = 30 Vdc	P _i = 700 mW per channel	T4	185 °F (85 °C)
			T5	167 °F (75 °C)
			T6	140 °F (60 °C)

Table 7-10: Maximum output of transmitter

Ex nA & Ex ec	One sensor using all output terminals (41-54)	Sensor using one set of output terminals (41-44 or 51-54)
Vmax = 7.2 Vdc	7.2 Vdc 12.9 mA 23.3 mW 200 mH 13.5 uF	7.2 Vdc 7.3 mA 13.2 mW 667 mH 13.5 uF

Special Conditions for Safe Use (X):

1. For all potentially explosive atmospheres, if the enclosure is made of non-metallic materials, or if it is made of metal having a paint layer thicker than 0.00787402 in. (0.2 mm) (Group IIC), or 0.07874016 in. (2 mm) (Group IIB, IIA, I), or any thickness (Group III), electrostatic charges shall be avoided.
2. The transmitter shall be installed in an enclosure providing a degree of protection of not less than IP54 in accordance with EN 60079-0, which is suitable for the application and correctly installed, e.g., in an enclosure that is in type of protection Ex n or Ex e.
3. Additionally, for Ex nA or Ex ec, the area inside the enclosure shall be pollution degree 2 or better, as defined in EN 60664-1.
4. For EPL Dc, the surface temperature “T” of the enclosure, for a dust layer with a maximum thickness of 0.19685039 in. (5 mm), is the ambient temperature +20K.

7.8 China

7.8.1 I3 China (NEPSI) Intrinsic Safety

- Certificate** GYJ21.1036X
- Markings** Ex ia IIC T4/T5/T6 Ga
Ex ib [ia Ga] IIC T4/T5/T6 Gb
Ex iaD 20 T80 °C/T95 °C/T130 °C
Ex ibD [iaD 20]21 T80 °C/T95 °C/T130 °C

Special Condition for Safe Use (X):

See certificate for special conditions.



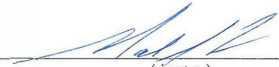
7.8.2 N3 China (NEPSI) Zone 2


Certificate	GYJ21.1036X
Markings	Ex nA [ic Gc] IIC T6...T4 Gc Ex ic IIC T6...T4 Gc

Special Condition for Safe Use (X):

See certificate for special conditions.


7.9 Declaration of conformity

	<h3 style="margin: 0;">EU Declaration of Conformity</h3> <p style="margin: 0;">No: RMD 1160 Rev. B</p>	
<p>We,</p> <p style="margin-left: 40px;">Rosemount, Inc. 6021 Innovation Boulevard Shakopee, MN 55379-4676 USA</p> <p>declare under our sole responsibility that the product,</p> <p style="text-align: center;">Rosemount™ 248R, 644R, 644T Temperature Transmitters with RK Option Code</p> <p>manufacturer,</p> <p style="margin-left: 40px;">Rosemount, Inc. 6021 Innovation Boulevard Shakopee, MN 55379-4676 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>		
 <hr style="border: 0; border-top: 1px solid black;"/> <p>(signature)</p>	<p>Vice President of Global Quality</p> <hr style="border: 0; border-top: 1px solid black;"/> <p>(function)</p>	
<p>Mark Lee</p> <hr style="border: 0; border-top: 1px solid black;"/> <p>(name)</p>	<p><i>August 30, 2021</i></p> <hr style="border: 0; border-top: 1px solid black;"/> <p>(date of issue)</p>	
<p>Page 1 of 2</p>		



EU Declaration of Conformity

No: RMD 1160 Rev. B



ATEX Directive (2014/34/EU)

DEKRA 21ATEX0003X – Intrinsic Safety Certificate
 Equipment Group II Category 1 G (Ex ia IIC T6...T4 Ga)
 Equipment Group II Category 2(1) G (Ex ib [ia Ga] IIC T6...T4 Gb)
 Equipment Group II Category 1 D (Ex ia IIIC Da)
 Equipment Group I Category M1 (Ex ia I Ma)

DEKRA 21ATEX0004X – Zone 2 Certificate
 Equipment Group II Category 3 G (Ex nA IIC T6...T4 Gc)
 Equipment Group II Category 3 G (Ex ec IIC T6...T4 Gc)
 Equipment Group II Category 3 G (Ex ic IIC T6...T4 Gc)
 Equipment Group II Category 3 D (Ex ic IIIC Dc)

Hammonized Standards:
 EN 60079-0:2012+A11: 2013 (a review against EN IEC 60079-0:2018, which is harmonized, shows no significant changes relevant to this equipment so EN 60079-0:2012_A11:2013 continues to represent "State of the Art"), EN 60079-7:2015+A1:2018, EN 60079-11:2012, EN 60079-15:2010

EMC Directive (2014/30/EU)
 Harmonized Standard: EN 61326-1:2013

RoHS Directive (2011/65/EU)
 Harmonized Standard: EN 50581:2012

ATEX Notified Bodies

DEKRA Certification B.V. [Notified Body Number: 0344]
 Meander 1051, 6825 MJ Arnhem
 P.O. Box 5185
 6802 ED Arnhem The Netherlands

ATEX Notified Body for Quality Assurance

SGS FIMKO OY [Notified Body Number: 0598]
 Takomotie 8
 FI-00380 HELSINKI
 Finland

Page 2 of 2

8 China RoHS

含有 China RoHS 管控物质超过最大浓度限值的部件型号列表 644R/T
List of 644R/T 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	X	O	O	O	O	O

本表格系依据 SJ/T11364 的规定而制作。
This table is proposed in accordance with the provision of SJ/T11364.

O: 意为该部件的所有均质材料中该有害物质的含量均低于 GB/T 26572 所规定的限量要求。
O: Indicate that said hazardous substance in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.

X: 意为在该部件所使用的的所有均质材料里，至少有一类均质材料中该有害物质的含量高于 GB/T 26572 所规定的限量要求。

X: Indicate that said hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.

部件名称 Part Name	组装备件说明 Spare Parts Descriptions for Assemblies
电子组件 Electronics Assembly	端子螺钉 Terminal Screws



Quick Start Guide
00825-0600-4728, Rev. AE
June 2024

For more information: [Emerson.com/global](https://emerson.com/global)

©2024 Emerson. All rights reserved.

Emerson Terms and Conditions of Sale are available upon request. The Emerson logo is a trademark and service mark of Emerson Electric Co. Rosemount is a mark of one of the Emerson family of companies. All other marks are the property of their respective owners.

ROSEMOUNT™

