

Rosemount™ 248 Temperature Transmitter



NOTICE

This guide provides basic guidelines for the Rosemount 248. It does not provide instructions for detailed configuration, diagnostics, maintenance, service, troubleshooting, or installations. Refer to the Rosemount 248 [Reference Manual](#) for more instruction. The manual and this guide are 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 Hazardous Locations Certifications for any restrictions associated with a safe installation.

Process leaks may cause harm or result in death.

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

Electrical shock can result in death or serious injury.

- Avoid contact with the leads and terminals. High voltage that may be present on leads can cause electrical shock.
- 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 have the same thread form. Only use plugs, adapters, glands, or conduit with a compatible thread form when closing entries.
- When installing in a Hazardous Location, use only appropriately listed or Ex certified plugs, adapters or glands in cable/conduit entries.

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1.0 Configure (bench calibration)

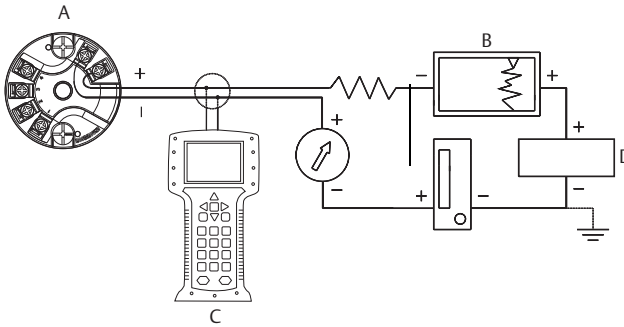
The Rosemount 248 can be configured 3 ways: a Field Communicator, the Rosemount 248 PC Programming Kit, or custom configured at the factory using the C1 option code.

Refer to the Rosemount 248 [Reference Manual](#) and the Field Communicator [Reference Manual](#) for more information.

1.1 Connecting a Field Communicator

The Field Communicator Field Device Revision Dev v1, DD v1 or later is required for complete functionality.

Figure 1. Connecting a Field Communicator to a Bench Loop



A. Rosemount 248 Transmitter
 B. $250 \Omega \leq R_L \leq 1100 \Omega$

C. Field Communicator
 D. Power supply

Note

Do not operate when power is below 12 Vdc at the transmitter terminal.

1.2 Verify transmitter configuration

To verify operation using a Field Communicator, refer to the Fast Keys below. Refer to the Rosemount 248 [Reference Manual](#) for more detailed description.

Function	Fast Keys	Function	Fast Keys
Active Calibrator	1, 2, 2, 1, 3	Poll Address	1, 3, 3, 3, 1
Alarm/Saturation	1, 3, 3, 2	Process Temperature	1, 1
AO Alarm Type	1, 3, 3, 2, 1	Process Variables	1, 1
Burst Mode	1, 3, 3, 3, 3	PV Damping	1, 3, 3, 1, 3
Burst Option	1, 3, 3, 3, 4	PV Unit	1, 3, 3, 1, 4
Calibration	1, 2, 2	Range Values	1, 3, 3, 1
Configuration	1, 3	Review	1, 4

Function	Fast Keys	Function	Fast Keys
D/A Trim	1, 2, 2, 2	Scaled D/A Trim	1, 2, 2, 3
Damping Values	1, 1, 10	Sensor Connection	1, 3, 2, 1, 1
Date	1, 3, 4, 2	Sensor 1 Setup	1, 3, 2, 1, 2
Descriptor	1, 3, 4, 3	Sensor Serial Number	1, 3, 2, 1, 3
Device Output Configuration	1, 3, 3	Sensor 1 Trim-Factory	1, 2, 2, 1, 2
Diagnostics and Service	1, 2	Sensor Type	1, 3, 2, 1, 1
Filter 50/60 Hz	1, 3, 5, 1	Software Revision	1, 4, 1
Hardware Rev	1, 4, 1	Status	1, 2, 1, 4
Intermittent Detect	1, 3, 5, 4	Terminal Temperature	1, 3, 2, 2,
Loop Test	1, 2, 1, 1	Test Device	1, 2, 1
LRV (Lower Range Value)	1, 1, 6	URV (Upper Range Value)	1, 1, 7
LSL (Lower Sensor Limit)	1, 1, 8	USL (Upper Sensor Limit)	1, 1, 9
Measurement Filtering	1, 3, 5	Variable Mapping	1, 3, 1
Message	1, 3, 4, 4	Variable Re-Map	1, 3, 1, 3
Num Req Preams	1, 3, 3, 3, 2	Write Protect	1, 2, 3
Open Sensor Holdoff	1, 3, 5, 3	2-Wire Offset	1, 3, 2, 1, 2, 1
Percent Range	1, 1, 5		

For devices following the new device dashboard, refer to the Fast Keys below:

Function	Fast Keys	Function	Fast Keys
Active Calibrator	3, 4, 1, 3	Poll Address	2, 2, 4, 1
Alarm Saturation	2, 2, 2, 5	Process Temperature	1, 3
AO Alarm Type	2, 2, 2, 5	Process Variables	3, 2, 1
Burst Mode	2, 2, 4, 2	PV Damping	2, 2, 1, 6
Calibration	3, 4, 1, 1	PV Unit	2, 2, 1, 4
Configuration	2, 2, 2, 4	Range Values	2, 2, 2, 4
D/A Trim	3, 4	Scaled D/A Trim	3, 4, 3
Damping Values	2, 2, 1, 6	Sensor Connection	2, 2, 1, 3
Date	2, 2, 3, 1, 2	Sensor 1 Set Up	2, 1, 1
Descriptor	2, 2, 3, 1, 4	Sensor Serial Number	1, 7, 1, 4
Device Info	1, 7	Sensor 1 Trim	3, 4, 1, 1
Device Output Configuration	2, 2, 2, 4	Sensor 1 Trim- Factory	3, 4, 1, 2
Filter 50/60 Hz	2, 2, 3, 7, 1	Sensor Type	2, 2, 1, 2
Hardware Rev	1, 7, 2, 3	Software Revision	1, 7, 2, 4
HART (R) Output	1, 7, 2, 1	Status	1, 1
Loop Test	3, 5, 1	Tag	2, 2, 3, 1, 1
LVR (Lower Range Value)	2, 2, 2, 4, 3	Terminal Temperature	3, 3, 2

Function	Fast Keys	Function	Fast Keys
LSL (Lower Sensor Limit)	2, 2, 1, 9	URV (Upper Range Value)	2, 2, 2, 4, 2
Message	2, 2, 3, 1, 3	USL (Upper Sensor Limit)	2, 2, 1, 8
Open Sensor Holdoff	2, 2, 3, 4	Write Protect	2, 2, 3, 6
Percent Range	2, 2, 2, 3	2-Wire Offset	2, 2, 1, 5

1.3 Rosemount 248 PC Programmer Kit installation

1. Install all necessary software for Rosemount 248 PC configuration:
 - a. Install the Rosemount 248C software.
 - Place the Rosemount 248C CD-ROM in the drive.
 - Run **setup.exe** from Windows™ NT, 2000, or XP.
 - b. Install the MACTek® HART Modem drivers completely before beginning bench configuration with the Rosemount 248 PC Programming system.

Note

For USB modem: Upon first use, configure appropriate COM ports within the Rosemount 248PC software by selecting **Port Settings** from the *Communicate* menu. The USB modem driver emulates a COM port and will add to available port selections in the software’s drop-down box. Otherwise software defaults to first available COM port, which may not be correct.

2. Set up configuration system hardware:
 - a. Hook up the transmitter and load resistor (250-1100 ohms) wired in series with the power supply (the Rosemount 248 device will need an external power supply of 12-42.4 Vdc for configuration).
 - b. Attach the HART modem in parallel with the load resistor and connect it to the PC.

See [Table 1](#) for spares kit and re-order numbers. For more information, refer to the Rosemount 248 [Reference Manual](#).

Table 1. Programming Kit Spare Part Numbers

Product description	Part number
Programming Software (CD)	00248-1603-0002
Rosemount 248 Programmer Kit - USB	00248-1603-0003
Rosemount 248 Programmer Kit - Serial	00248-1603-0004

2.0 Mount the transmitter

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

2.1 Typical European and Asia Pacific installation

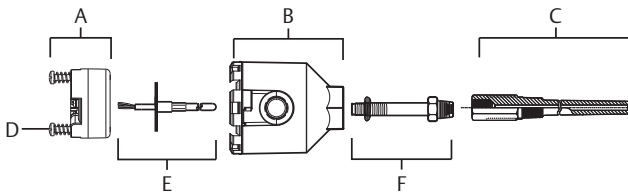
Head mount transmitter with DIN plate style sensor

1. Attach the thermowell to the pipe or process container wall. Install and tighten the thermowell before applying process pressure.

2. Assemble the transmitter to the sensor. Push the transmitter mounting screws through the sensor mounting plate and insert the snap rings (optional) into the transmitter mounting screw groove.
3. Wire the sensor to the transmitter.
4. 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.
5. Slip the shielded cable through the cable gland.
6. Attach a cable gland into the shielded cable.
7. Insert the shielded cable leads into the connection head through the cable entry. Connect and tighten the cable gland.
8. Connect the shielded power cable leads to the transmitter power terminals. Avoid contact with sensor leads and sensor connections.
9. Install and tighten the connection head cover.

Note

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



A. Rosemount 248 Transmitter

B. Connection head

C. Thermowell

D. Transmitter mounting screws

E. Integral mount sensor with flying leads

F. Extension

2.2 Typical North and South American installation

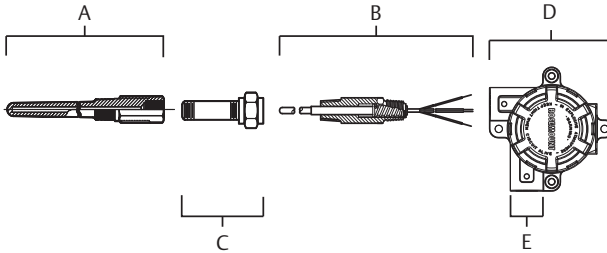
Head mount transmitter with threaded sensor

1. Attach the thermowell to the pipe or process container wall. Install and tighten thermowell 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. Pull the sensor wiring leads through the universal head and transmitter. Mount the transmitter in the universal head by threading the transmitter mounting screws into the universal head mounting holes.
5. Mount the transmitter-sensor assembly into the thermowell. Seal adapter threads with silicone tape.

6. Install conduit for field wiring to the conduit entry of the universal head. Seal conduit 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.

Note

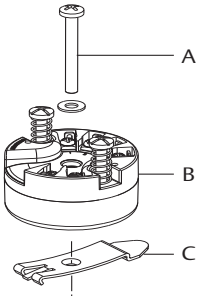
Enclosure covers must be fully engaged to meet explosion-proof requirements.



- | | |
|--------------------------|-------------------|
| A. Threaded thermowell | D. Universal head |
| B. Threaded style sensor | E. Conduit entry |
| C. Standard extension | |

2.3 Mounting to a DIN rail

To attach the Rosemount 248H to a DIN rail, assemble the appropriate rail mounting kit (part number 00248-1601-0001) to the transmitter as shown.



- | |
|----------------------|
| A. Mounting hardware |
| B. Transmitter |
| C. Rail clip |

Rail mount transmitter with remote mount sensor

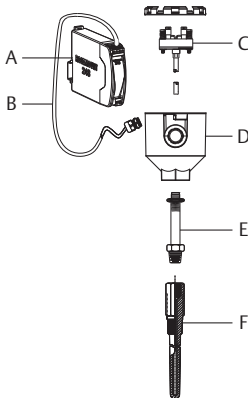
The least complicated assembly uses:

- a remote mounted transmitter
- an integral mount sensor with terminal block
- an integral style connection head
- a standard extension
- a threaded thermowell

Refer to the Metric Sensor [Product Data Sheet](#) for complete sensor and mounting accessory information.

To complete the assembly, follow the procedure described below.

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. 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. Avoid contact with leads and terminals.



- | | |
|--|------------------------|
| A. Rail mount transmitter | D. Connection head |
| B. Sensor leads with cable gland | E. Standard extension |
| C. Integral mount sensor with terminal block | F. Threaded thermowell |

Rail mount transmitter with threaded sensor

The least complicated assembly uses:

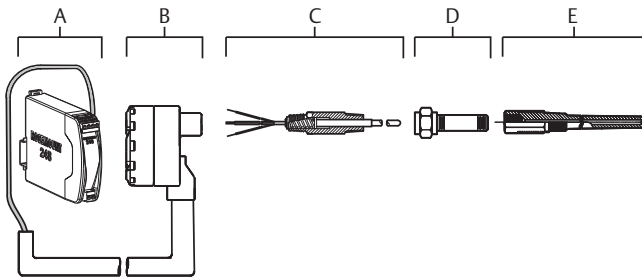
- a threaded sensor with flying heads
- a threaded sensor connection head
- a union and nipple extension assembly
- a threaded thermowell

Refer to Rosemount Sensor [Product Data Sheet](#) for complete sensor and mounting accessory information.

To complete the assembly, follow the procedure described below.

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 necessary extension nipples and adaptors. 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. 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. Enclosure covers must be fully engaged to meet explosion-proof requirements.
9. Attach the sensor and power leads to the transmitter. Avoid contact with leads and terminals.



A. Rail mount transmitter
 B. Threaded sensor connection head
 C. Threaded style sensor

D. Standard extension
 E. Threaded thermowell

3.0 Connect the wiring

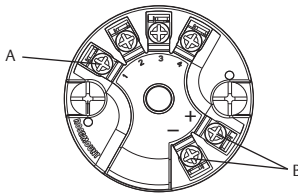
- Wiring diagrams are located on the top label of the transmitter.
- An external power supply is required to operate the transmitter.
- The power required across the transmitter power terminals is 12 to 42.4 V dc (the power terminals are rated to 42.4 V dc).

Note

To prevent damaging the transmitter, do not allow terminal voltage to drop below 12.0 V dc when changing the configuration parameters.

3.1 Power the transmitter

1. Connect the positive power lead to the “+” terminal. Connect the negative power lead to the “-” terminal.
2. Tighten the terminal screws.
3. Apply power (12–42 V dc).

Figure 2. Power, Communication, and Sensor Terminals

- A. Sensor terminals
B. Power/communication terminals

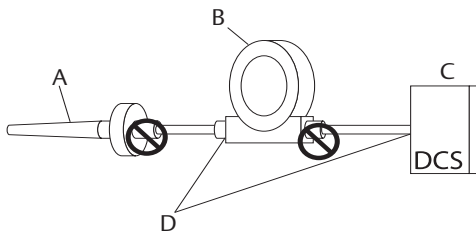
3.2 Ground the transmitter

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 (for grounded housing)

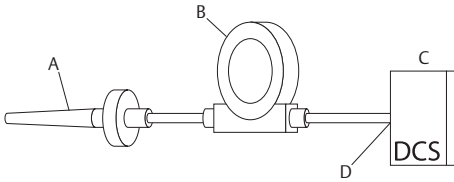
1. Connect sensor wiring shield to the transmitter housing.
2. Ensure the sensor shield is electrically isolated from surrounding fixtures that may be grounded.
3. Ground signal wiring shield at the power supply end.



- A. Sensor wires
B. Transmitter
C. 4-20 mA loop
D. Shield ground point

Option 2 (for ungrounded housing)

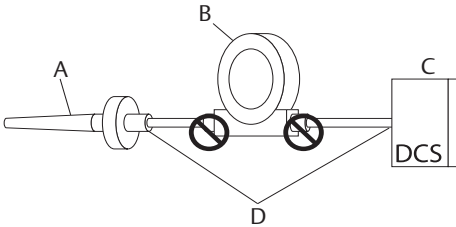
1. Connect signal wiring shield to the sensor wiring shield.
2. Ensure the two shields are tied together and electrically isolated from the transmitter housing.
3. Ground shield at the power supply end only.
4. Ensure the sensor shield is electrically isolated from the surrounding grounded fixtures.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



- A. Sensor wires
- B. Transmitter
- C. 4-20 mA loop
- D. Shield ground point

Option 3 (for grounded or ungrounded housing)

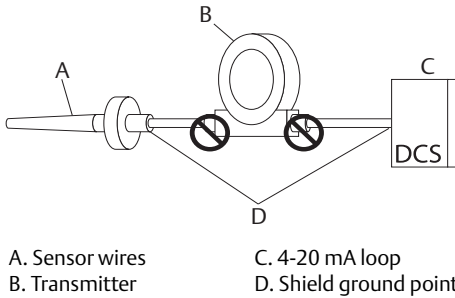
1. Ground sensor wiring shield at the sensor, if possible.
2. Ensure the sensor wiring and signal wiring shields are electrically isolated from the transmitter housing.
3. Do not connect the signal wiring shield to the sensor wiring shield.
4. Ground signal wiring shield at the power supply end.



- A. Sensor wires
- B. Transmitter
- C. 4-20 mA loop
- D. Shield ground point

Option 4 (for grounded thermocouple inputs)

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.



4.0 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.

Note

This is not available with the Rosemount 248C Configuration Interface.

4.1 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, select: **1) Device Setup > 2) Diag/Serv > 1) Test Device > 1) Loop Test.**
3. Select a discrete milliampere level for the transmitter to output. At *Choose Analog Output*, select: **1) 4 mA > 2) 20 mA**, or select **3) Other** to manually input a value between 4 and 20 milliamperes.
4. Select **Enter** to show the fixed output.
5. Select **OK**.
6. In the test loop, check that the fixed mA input and the transmitter's mA output are the same value.

Note

If the readings do not match, either the transmitter requires an output trim or the current meter is malfunctioning.

After completing the test, the display returns to the loop test screen and allows the user to choose another output value.

4.2 End the loop test

1. Select **5) End**.
2. Select **Enter**.

5.0 Product Certifications

Rev 1.13

5.1 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.

5.2 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).

5.3 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.

5.4 USA

E5 USA Explosionproof

Certificate: 3016555

Standards: FM Class 3600:2011, FM Class 3611:2004, FM Class 3615:2006,
FM Class 3810:2005, ANSI/ISA 60079-0:2009, ANSI/ISA 60079-11:2009,
IEC 60529: 2004, NEMA® – 250: 1991

Markings: XP CL I, DIV 1, GP B, C, D; DIP CL II/III, DIV 1, GP E, F, G); NI CL1, DIV 2,
GP A, B, C, D when installed per Rosemount drawing 00248-1065; Type 4;

I5 FM Intrinsic Safety

Certificate: 3016555

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

Markings: S CL I/II/III, DIV 1, GP A, B, C, D, E, F, G; NI CL1, DIV 2, GP A, B, C, D
when installed per Rosemount drawing 00248-1055; Type 4X; IP66/68

5.5 Canada

I6 Canada Intrinsically Safe

Certificate: 1091070

Standards: CAN/CSA C22.2 No. 0-10, CSA Std. C22.2 No. 25-1966,
CAN/CSA C22.2 No. 94-M91, CAN/CSA C22.2 No. 157-92,
CSA C22.2 No. 213-M1987, C22.2 No 60529-05

Markings: IS CL I, DIV 1 GP A, B, C, D when installed per Rosemount drawing
00248-1056; Suitable for CL I DIV 2 GP A, B, C, D when installed per
Rosemount drawing 00248-1055; Type 4X, IP66/68

- K6** CSA Intrinsically Safe, Explosionproof, and Class 1, 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 C22.2 No. 213-M1987, C22.2 No 60529-05
- Markings: XP CL I/II/III, DIV 1, GP B, C, D, E, F, G when installed per Rosemount drawing 00248-1059; IS CL I, DIV 1 GP A, B, C, D when installed per Rosemount drawing 00248-1056; Suitable for CL I DIV 2 GP A, B, C, D when installed per Rosemount drawing 00248-1055; Type 4X, IP66/68 Conduit Seal not required

5.6 Europe

- E1** ATEX Flameproof
 Certificate: FM12ATEX0065X
 Standards: EN 60079-0: 2012, EN 60079-1: 2007, EN 60529:1991 +A1:2000
 Markings: (Ex)II 2 G Ex d IIC T6...T1 Gb, T6(-50 °C ≤ T_a ≤ +40 °C),
 T5...T1(-50 °C ≤ T_a ≤ +60 °C)

See [Table 2](#) at the end of the Product Certifications section for Process Temperatures.

Special Conditions for Safe 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: Baseefa03ATEX0030X
 Standards: EN 60079-0: 2012, EN 60079-11: 2012
 Markings: (Ex)II 1 G Ex ia IIC T5/T6 Ga, T5(-60 °C ≤ T_a ≤ +80 °C),
 T6(-60 °C ≤ T_a ≤ +60 °C)

See [Table 3](#) at the end of the Product Certifications section for Entity Parameters.

Special Condition for Safe Use (X):

1. The apparatus must be installed in an enclosure which affords it a degree of protection of at least IP20. Non-metallic enclosures must have a surface resistance of less than 1 GΩ; light allow or zirconium enclosures must be protected from impact and friction when installed.

- 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 ($-40^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$)
- NC** ATEX Type n – without enclosure
 Certificate: Baseefa13ATEX0045X
 Standards: EN 60079-0:2012, EN 60079-15:2010
 Markings: Ex II 3 G Ex nA IIC T5 Gc ($-40^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$)

Special Condition for Safe Use (X):

1. The Model 248 Temperature 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

- ND** ATEX Dust
 Certificate: FM12ATEX0065X
 Standards: EN 60079-0: 2012, EN 60079-31: 2009, EN 60529:1991 +A1:2000
 Markings: Ex II 2 D Ex tb IIIC T130 °C Db, ($-40^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$); IP66
 See [Table 2](#) at the end of the Product Certifications section for Process Temperatures.

Special Conditions for Safe 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.

5.7 International

- E7** ECEEx Flameproof
 Certificate: IECEX FMG 12.0022X
 Standards: IEC 60079-0:2011, IEC 60079-1:2007-04,
 Markings: Ex d IIC T6...T1 Gb, T6($-50^{\circ}\text{C} \leq T_a \leq +40^{\circ}\text{C}$), T5...T1($-50^{\circ}\text{C} \leq T_a \leq +60^{\circ}\text{C}$)
 See [Table 2](#) at the end of the Product Certifications section for Process Temperatures.

Special Conditions for Safe 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 ECEX Intrinsic Safety

Certificate: IECEx BAS 07.0086X

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

Markings: Ex ia IIC T5/T6 Ga, T5(-60 °C ≤ T_a ≤ +80 °C), T6(-60 °C ≤ T_a ≤ +60 °C)See [Table 3](#) at the end of the Product Certifications section for Entity Parameters**Special Condition for Safe Use (X):**

1. The apparatus must be installed in an enclosure which affords it a degree of protection of at least IP20. Non-metallic enclosures must have a surface resistance of less than 1 GΩ; light allow or zirconium enclosures must be protected from impact and friction when installed.

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; T5(-40 °C ≤ T_a ≤ +70 °C)**NG** IECEx Type n – without enclosure

Certificate: IECEx BAS 13.0029X

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

Markings: Ex nA IIC T5/T6 Gc; T5(-60 °C ≤ T_a ≤ +80 °C), T6(-60 °C ≤ T_a ≤ +60 °C)**Special Condition for Safe Use (X):**

1. The Model 248 Temperature 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.

5.8 China

E3 NEPSI Flameproof

Certificate: GYJ16.1335X

Standards: GB3836.1-2010, GB3836.2-2010

Markings: Ex d IIC T6~T1 Gb: T6...T1(-50 °C ≤ T_a ≤ +40 °C)T5...T1 (-50 °C ≤ T_a ≤ +60 °C)

Special Conditions for Safe Use (X):

1. Ambient temperature range is: T6...T1(-50 °C ≤ T_a ≤ +40 °C) T5...T1 (-50 °C ≤ T_a ≤ +60 °C).
2. The earth connection facility in the enclosure should be connected reliably.
3. During installation, there should be no mixture harmful to flameproof housing.
4. During installation in hazardous location, cable glands, conduits and blanking plugs, certified by state-appointed inspection bodies with Ex d IIC Gb degree, should be used.
5. During installation, use and maintenance in explosive gas atmospheres, observe the warning “Do not open when energized”.
6. End user is not permitted to change any components inside, but to settle the problem in conjunction with manufacturer to avoid damage to the product.
7. When 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)”
 GB50257-2015 “Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering”

I3 NEPSI Intrinsic Safety

Certificate: GYJ16.1334X

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

Markings: Ex ia IIC T5/T6 Ga; T5(-60 °C ≤ T_a ≤ +80 °C), T6(-60 °C ≤ T_a ≤ +60 °C)

See [Table 3](#) at the end of the Product Certifications section for Entity Parameters.

Special Conditions for Safe Use (X):

1. Symbol “X” is used to denote specific conditions of use:
 - a. The enclosure may contain light metal, attention should be taken to avoid ignition hazard due to impact or friction
 - b. The apparatus must be installed in an enclosure which affords it a degree of protection of at least IP20. Non-metallic enclosures must have a surface resistance of less than 1 GΩ.
2. The relation between T code and ambient temperature range is:

T code	Temperature range
T6	-60 °C ≤ T _a ≤ +60 °C
T5	-60 °C ≤ T _a ≤ +80 °C

3. Intrinsically Safe parameters:
HART loop terminals (+ and -)

Maximum input voltage U _i (V)	Maximum input current I _i (mA)	Maximum input power: P _i (W)	Maximum internal parameters	
			C _i (nF)	L _i (mH)
30	130	1.0	3.6	0

The above supply must be derived from a linear supply.

Sensor terminals (1 to 4)

Maximum output voltage U_o (V)	Maximum output current I_o (mA)	Maximum output power: P_o (mW)	Maximum internal parameters	
			C_i (nF)	L_i (mH)
45	26	290	2.1	0

Sensor terminals (1 to 4)

Group	Maximum external parameters	
	C_o (nF)	L_o (mH)
IIC	23.8	23.8
IIB	237.9	87.4
IIA	727.9	184.5

- 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.
- End user is not permitted to change any components inside, but to settle the problem in conjunction with manufacturer to avoid damage to the product.
- When installation, use and maintenance of this product, observe the following standards:
GB3836.13-1997 "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)"
GB50257-1996 "Code for construction and acceptance of electrical device for explosion atmospheres and fire hazard electrical equipment installation engineering."

N3 NEPSI Type n

Certificate: GYJ15.1089

Standards: GB3836.1-2010, GB3836.8-2003

Markings: Ex nA nL II T5 Gc ($-40^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$)**Special Condition for Safe Use (X):**

- See certificate for special conditions

5.9 EAC

EM Technical Regulation Customs Union (EAC) Flameproof

Certificate: TC RU C-US.AA87.B.00057

Markings: 1Ex d IIC T6...T1 Gb X, T6 ($-50^{\circ}\text{C} \leq T_a \leq +40^{\circ}\text{C}$),T5...T1 ($-50^{\circ}\text{C} \leq T_a \leq +60^{\circ}\text{C}$); IP66/IP67

Special Condition for Safe Use (X):

1. See certificate for special conditions.

IM Technical Regulation Customs Union (EAC) Intrinsic Safety

Certificate: TC RU C-US.AA87.B.00057

Markings: 0Ex ia IIC T5, T6 Ga X, T6(-60 °C ≤ T_a ≤ +60 °C),
T5(-60 °C ≤ T_a ≤ +80 °C); IP66/IP67

Special Condition for Safe Use (X):

1. See certificate for special conditions.

5.10 Combinations

K5 Combination of E5 and I5

KM Combination of EM and IM

Table 2. Process Temperatures

Temperature class	Ambient temperature	Process temperature without LCD display cover (°C)			
		No ext.	3-in.	6-in.	9-in.
T6	-50 °C to +40 °C	55	55	60	65
T5	-50 °C to +60 °C	70	70	70	75
T4	-50 °C to +60 °C	100	110	120	130
T3	-50 °C to +60 °C	170	190	200	200
T2	-50 °C to +60 °C	280	300	300	300
T1	-50 °C to +60 °C	440	450	450	450

Table 3. Entity Parameters

Parameters	HART loop terminals + and -	Sensor terminals 1 to 4
Voltage U _i	30 V	45 V
Current I _i	130 mA	26 mA
Power P _i	1 W	290 mW
Capacitance C _i	3.6 nF	2.1 nF
Inductance L _i	0 mH	0 μH

5.11 Additional Certifications (Rosemount 248 Head Mount only)

SBS American Bureau of Shipping (ABS) Type Approval

Certificate: 11-HS771994B-1-PDA

Intended Use: Measurement of temperature for marine and offshore applications.

SBV Bureau Veritas (BV) Type Approval

Certificate: 26325

Requirements: Bureau Veritas Rules for the Classification of Steel Ships

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

Temperature transmitter cannot be installed on diesel engines.

SDN Det Norske Veritas (DNV) Type Approval

Certificate: A-14187

Intended Use: Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards.

Application:



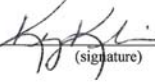
Location classes	
Temperature	D
Humidity	B
Vibration	A
EMC	A
Enclosure	B/IP66 AI, C/IP66: SST

SLL Lloyds Register (LR) Type Approval

Certificate: 11/60002

Application: Environmental categories ENV1, ENV2, ENV3, and ENV5

Figure 3. Rosemount 248 Declaration of Conformity

	<h2>EU Declaration of Conformity</h2> <p>No: RMD 1049 Rev. J</p>	
<p>We,</p>		
<p>Rosemount, Inc. 8200 Market Boulevard Chanhassen, MN 55317-9685 USA</p>		
<p>declare under our sole responsibility that the product,</p>		
<p>Rosemount 248 Temperature Transmitter</p>		
<p>manufactured by,</p>		
<p>Rosemount, Inc. 8200 Market Boulevard Chanhassen, MN 55317-9685 USA</p>		
<p>to which this declaration relates, is in conformity with the provisions of the European Union Directives, including the latest amendments, as shown in the attached schedule.</p>		
<p>Assumption of conformity is based on the application of the harmonized standards and, when applicable or required, a European Union notified body certification, as shown in the attached schedule.</p>		
 (signature)	Vice President of Global Quality (function)	
Kelly Klein (name)	19 Apr 2016 (date of issue)	
<p>Page 1 of 3</p>		



EU Declaration of Conformity



No: RMD 1049 Rev. J

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

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

Harmonized Standards: EN61326-1:2013, EN61326-2-3:2013

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

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

Baseefa03ATEX0030X – Intrinsic Safety Certificate

Equipment Group II, Category 1 G

Ex ia IIC T5/T6 Ga

Harmonized Standards:

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

BAS00ATEX3145 – Type n Certificate

Equipment Group II, Category 3 G

Ex nA IIC T5 Gc

Harmonized Standards:

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

Baseefa13ATEX0045X – Type n Certificate; no enclosure option

Equipment Group II, Category 3 G

Ex nA IIC T5/T6 Gc

Harmonized Standards:

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

FM12ATEX0065X – Flameproof Certificate

Equipment Group II, Category 2 G

Ex d IIC T6...T1 Gb

Harmonized Standards:

EN60079-0:2012, EN60079-1:2007

FM12ATEX0065X – Dust Certificate

Equipment Group II, Category 2 D

Ex tb IIIC T130°C Db

Harmonized Standards:

EN60079-0:2012, EN60079-31:2009



EU Declaration of Conformity



No: RMD 1049 Rev. J

ATEX Notified Bodies

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

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

ATEX Notified Body for Quality Assurance

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

含有 China RoHS 管控物质超过最大浓度限值的部件型号列表 Rosemount 248
List of Rosemount 248 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
壳体组件 Housing Assembly	O	O	O	X	O	O
传感器组件 Sensor Assembly	X	O	O	O	O	O

本表格系依据 SJ/T11364 的规定而制作。

This table is proposed in accordance with the provision of SJ/T11364.

O: 意为该部件的所有均质材料中该有害物质的含量均低于 GB/T 26572 所规定的限量要求。

O: Indicate that said hazardous substance in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.

X: 意为在该部件所使用的所有均质材料里，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.



Global Headquarters

Emerson Automation Solutions
6021 Innovation Blvd.
Shakopee, MN 55379, USA
+1 800 999 9307 or +1 952 906 8888
+1 952 949 7001
RFQ.RMD-RCC@Emerson.com

North America Regional Office

Emerson Automation Solutions
8200 Market Blvd.
Chanhassen, MN 55317, USA
+1 800 999 9307 or +1 952 906 8888
+1 952 949 7001
RMT-NA.RCCRFQ@Emerson.com

Latin America Regional Office

Emerson Automation Solutions
1300 Concord Terrace, Suite 400
Sunrise, FL 33323, USA
+1 954 846 5030
+1 954 846 5121
RFQ.RMD-RCC@Emerson.com

Europe Regional Office

Emerson Automation Solutions
Neuhofstrasse 19a P.O. Box 1046
CH 6340 Baar
Switzerland
+41 (0) 41 768 6111
+41 (0) 41 768 6300
RFQ.RMD-RCC@Emerson.com

Asia Pacific Regional Office

Emerson Automation Solutions
1 Pandan Crescent
Singapore 128461
+65 6777 8211
+65 6777 0947
Enquiries@AP.Emerson.com

Middle East and Africa Regional Office

Emerson Automation Solutions
Emerson FZE P.O. Box 17033
Jebel Ali Free Zone - South 2
Dubai, United Arab Emirates
+971 4 8118100
+971 4 8865465
RFQ.RMTMEA@Emerson.com



[Linkedin.com/company/Emerson-Automation-Solutions](https://www.linkedin.com/company/Emerson-Automation-Solutions)



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