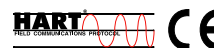


Rosemount 248 Temperature Transmitter and Monitoring Assembly

- *The headmount transmitter and sensor assembly are available in a single model number*
- *Remove it from the box and it is ready to install into the process*
- *Unsurpassed performance for temperature monitoring points*
- *Industry standard DIN Form B headmount transmitter size enables mounting in any connection head*
- *New compact DIN railmount style*
- *Reliable EMC performance meets NAMUR NE21 recommendation*
- *Communicates using open 4–20 mA/HART® Protocol*
- *A 248C PC-based HART configuration interface is available*



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Transmitter Specifications

FUNCTIONAL SPECIFICATIONS

Inputs

User-selectable; sensor terminals rates to 42.4 V dc. See "Transmitter Accuracy and Ambient Temperature Effects" on page 4 for sensor options.

Output

2-wire 4–20 mA, linear with temperature or input; digital output signal superimposed on 4–20 mA signal, available for a *HART* communicator or control system interface.

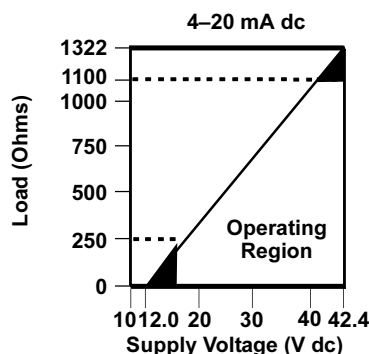
Isolation

Input/output isolation tested to 500 V ac rms (707 V dc) at 50/60 Hz.

Power Supply

An external power supply is required for *HART* devices. The transmitter operates on 12.0 to 42.4 VDC transmitter terminal voltage with load resistance between 250 and 1100 ohms. A minimum of 17.75 VDC power supply is required with a load of 250 ohms. Transmitter power terminals are rated to 42.4 V DC.

$$\text{Maximum Load} = 40.8 \times (\text{Supply Voltage} - 12.0)$$



Humidity Limits

0–99% relative humidity, non-condensing

NAMUR Recommendations

The 248 meets the following NAMUR recommendations:

- NE 21 – Electromagnetic compatibility (EMC) for Process and Laboratory Apparatus
- NE 43 – Standard of the signal level breakdown information of digital transmitters
- NE 89 – Standard of temperature transmitters with digital signal processing

Transient Protection

The optional Rosemount 470 Transient Protector prevents damage from transients induced by lightning, welding, heavy electrical equipment, or switch gears. Refer to the 470 Product Data Sheet (document number 00813-0100-4191) for more information.

Temperature Limits

Operating Limit

- –40 to 85 °C (–40 to 185 °F)

Storage Limit

- –50 to 120 °C (–58 to 248 °F)

Turn-on Time

Performance within specifications in less than 5.0 seconds after power is applied to transmitter, when damping value is set to zero seconds.

Update Rate

Less than 0.5 seconds

Damping

32 seconds maximum. 5 seconds default

Custom Alarm and Saturation Levels

Custom factory configuration of alarm and saturation levels is available with option code C1 for valid values. These values can also be configured in the field using a *HART* Communicator.

Recommended Minimum Measuring Span

10 K

Software Detected Failure Mode

The values at which the transmitter drives its output in failure mode depends on whether it is configured to standard, custom, or NAMUR-compliant (NAMUR recommendation NE 43) operation. The values for standard and NAMUR-compliant operation are as follows:

TABLE 1. Operation Parameters

	Standard ⁽¹⁾	NAMUR NE43-Compliant ⁽¹⁾
Linear Output:	$3.9 \leq I \leq 20.5$	$3.8 \leq I \leq 20.5$
Fail High:	$21 \leq I \leq 23$ (default)	$21 \leq I \leq 23$ (default)
Fail Low:	$I \leq 3.75$	$I \leq 3.6$

(1) Measured in milliamperes

Certain hardware failures, such as microprocessor failures, will always drive the output to greater than 23 mA.

PHYSICAL SPECIFICATIONS

HART Communicator Connections

Communication Terminal: Clips permanently fixed to the terminals

Materials of Construction

Electronics Housing

- *Noryl*® glass reinforced

Universal (option code U and H) and Rosemount® Connection (option code A and G) Heads

- Housing: Low-copper aluminum (option codes U and A)
Stainless Steel (option codes G and H)

- Paint: Polyurethane

- Cover O-Ring: Buna-N

BUZ Head (option code B)

- Housing: Aluminum

- Paint: Aluminum lacquer

- O-Ring Seal: Rubber

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Mounting

The 248R attaches directly to a wall or a DIN rail. The 248H installs in a connection head or universal head mounted directly on a sensor assembly or apart from a sensor assembly using a universal head. The 248H can also mount to a DIN rail using an optional mounting clip (see Table 18).

Weight

Code	Options	Weight
248H	Headmount Transmitter	42 g (1.5 oz)
248R	Railmount Transmitter	250 g (8.8 oz)
U	Universal Head	520 g (18.4 oz)
B	BUZ Head	240 g (8.5 oz)
C	Polypropylene Head	90 g (3.2 oz.)
A	Rosemount Connection Head	524 g (18.5 oz)
S	Polished Stainless Steel (SST) Head	537 g (18.9 oz)
G	Rosemount Connection Head (SST)	1700 g (60 oz)
H	Universal Head (SST)	1700 g (60 oz)

Enclosure Ratings

The Universal (option code U) and Rosemount Connection (option code A) Heads are NEMA 4X, IP66, and IP68. The Universal Head with 1/2 NPT threads is CSA Enclosure Type 4X. The BUZ head (option code B) is NEMA 4 and IP65.

PERFORMANCE SPECIFICATIONS

EMC (ElectroMagnetic Compatibility)

NAMUR NE21 Standard

The 248 meets the requirements for NAMUR NE21 Rating

Susceptibility	Parameter	Influence
ESD	• 6 kV contact discharge	None
	• 8 kV air discharge	
Radiated	• 80 – 1000 MHz at 10 V/m AM	None
Burst	• 1 kV for I.O.	None
Surge	• 0.5 kV line–line	None
	• 1 kV line–ground (I.O. tool)	
Conducted	• 150 kHz to 80 MHz at 10 V	None

CE Mark

The 248 meets all requirements listed under IEC 61326: Amendment 1, 2006.

Power Supply Effect

Less than $\pm 0.005\%$ of span per volt

Vibration Effect

The 248 is tested to the following specifications with no effect on performance:

Frequency	Vibration
10 to 60 Hz	0.21 mm displacement
60 to 2000 Hz	3 g peak acceleration

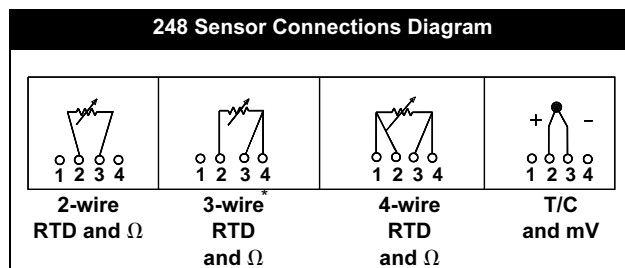
Stability

For RTD and thermocouple inputs the transmitter will have a stability of $\pm 0.1\%$ of reading or $0.1\text{ }^{\circ}\text{C}$ (whichever is greater) for twelve months

Self Calibration

The analog-to-digital measurement circuitry automatically self-calibrates for each temperature update by comparing the dynamic measurement to extremely stable and accurate internal reference elements.

Sensor Connections



* Rosemount Inc. provides 4-wire sensors for all single element RTDs. You can use these RTDs in 3-wire configurations by leaving the unneeded leads disconnected and insulated with electrical tape.

Transmitter Accuracy and Ambient Temperature Effects

NOTE

The accuracy and ambient temperature effect is the greater of the fixed and percent of span values (see example below).

TABLE 2. 248 Transmitter Input Options, Accuracy, and Ambient Temperature Effects

Sensor	Transmitter Input Ranges ⁽¹⁾		Accuracy ⁽¹³⁾		Temperature Effects per 1.0 °C (1.8 °F) Change in Ambient Temperature ⁽²⁾⁽¹²⁾	
	°C	°F	Fixed	% of Span	Fixed	% of Span
2-, 3-, 4-wire RTDs						
Pt 100 ⁽³⁾ ($\alpha = 0.00385$)	-200 to 850	-328 to 1562	0.2 °C (0.36 °F)	±0.1	0.006 °C (0.011 °F)	±0.004
Pt 100 ⁽⁴⁾ ($\alpha = 0.003916$)	-200 to 645	-328 to 1193	0.2 °C (0.36 °F)	±0.1	0.006 °C (0.011 °F)	±0.004
Pt 200 ⁽³⁾	-200 to 850	-328 to 1562	1.17 °C (2.11 °F)	±0.1	0.018 °C (0.032 °F)	±0.004
Pt 500 ⁽³⁾	-200 to 850	-328 to 1562	0.47 °C (0.85 °F)	±0.1	0.018 °C (0.032 °F)	±0.004
Pt 1000 ⁽³⁾	-200 to 300	-328 to 572	0.23 °C (0.41 °F)	±0.1	0.010 °C (0.018 °F)	±0.004
Ni 120 ⁽⁵⁾	-70 to 300	-94 to 572	0.16 °C (0.29 °F)	±0.1	0.004 °C (0.007 °F)	±0.004
Cu 10 ⁽⁶⁾	-50 to 250	-58 to 482	2 °C (3.60 °F)	±0.1	0.06 °C (0.108 °F)	±0.004
Cu 50 ($\alpha = 0.00428$)	-185 to 200	-365 to 392	0.68 °C (1.22 °F)	±0.1	0.012 °C (0.022 °F)	±0.004
Cu 100 ($\alpha = 0.00428$)	-185 to 200	-365 to 392	0.34 °C (0.61 °F)	±0.1	0.006 °C (0.011 °F)	±0.004
Cu 50 ($\alpha = 0.00426$)	-50 to 200	-122 to 392	0.68 °C (1.22 °F)	±0.1	0.012 °C (0.022 °F)	±0.004
Cu 100 ($\alpha = 0.00426$)	-50 to 200	-122 to 392	0.34 °C (0.61 °F)	±0.1	0.006 °C (0.011 °F)	±0.004
PT 50 ($\alpha = 0.00391$)	-200 to 550	-392 to 1022	0.40 °C (0.72 °F)	±0.1	0.012 °C (0.022 °F)	±0.004
PT 100 ($\alpha = 0.00391$)	-200 to 550	-392 to 1022	0.20 °C (0.36 °F)	±0.1	0.006 °C (0.011 °F)	±0.004
Thermocouples ⁽⁷⁾						
Type B ^{(8) (9)}	100 to 1820	212 to 3308	1.5 °C (2.70 °F)	±0.1	0.056 °C (0.101 °F)	±0.004
Type E ⁽⁸⁾	-50 to 1000	-58 to 1832	0.4 °C (0.72 °F)	±0.1	0.016 °C (0.029 °F)	±0.004
Type J ⁽⁸⁾	-180 to 760	-292 to 1400	0.5 °C (0.90 °F)	±0.1	0.016 °C (0.029 °F)	±0.004
Type K ^{(8) (10)}	-180 to 1372	-292 to 2502	0.5 °C (0.90 °F)	±0.1	0.02 °C (0.036 °F)	±0.004
Type N ⁽⁸⁾	-200 to 1300	-328 to 2372	0.8 °C (1.44 °F)	±0.1	0.02 °C (0.036 °F)	±0.004
Type R ⁽⁸⁾	0 to 1768	32 to 3214	1.2 °C (2.16 °F)	±0.1	0.06 °C (0.108 °F)	±0.004
Type S ⁽⁸⁾	0 to 1768	32 to 3214	1 °C (1.80 °F)	±0.1	0.06 °C (0.108 °F)	±0.004
Type T ⁽⁸⁾	-200 to 400	-328 to 752	0.5 °C (0.90 °F)	±0.1	0.02 °C (0.036 °F)	±0.004
DIN Type L ⁽¹¹⁾	-200 to 900	-328 to 1652	0.7 °C (1.26 °F)	±0.1	0.022 °C (0.040 °F)	±0.004
DIN Type U ⁽¹¹⁾	-200 to 600	-328 to 1112	0.7 °C (1.26 °F)	±0.1	0.026 °C (0.047 °F)	±0.004
Type W5Re/W26Re ⁽¹²⁾	0 to 2000	32 to 3632	1.4 °C (2.52 °F)	±0.1	0.064 °C (0.115 °F)	±0.004
GOST Type L	-200 to 800	-392 to 1472	0.50 °C (0.90 °F)	±0.1	0.003 °C (0.005 °F)	±0.004
Millivolt Input	-10 to 100 mV		0.03 mV	±0.1	0.001 mV	±0.004
2-, 3-, 4-wire Ohm Input	0 to 2000 ohms		0.7 ohm	±0.1	0.028 ohm	±0.004

(1) Input ranges are for transmitter only. Actual sensor (RTD or Thermocouple) operating ranges may be more limited. See "Sensor Specifications" on page 6 for temperature ranges.

(2) Change in ambient is with reference to the calibration temperature of the transmitter at 68 °F (20 °C) from factory.

(3) IEC 751, 1995

(4) JIS 1604, 1981

(5) Edison Curve No. 7

(6) Edison Copper Winding No. 15

(7) Total accuracy for thermocouple measurement: sum of accuracy +0.5 °C.

(8) NIST Monograph 175, IEC 584

(9) Fixed accuracy for NIST Type B is ±5.4 °F (±3.0 °C) from 212 to 572 °F (100 to 300 °C).

(10) Fixed accuracy for NIST Type K is ±1.3 °F (±0.7 °C) from -292 to -130 °F (-130 to -90 °C).

(11) DIN 43710

(12) ASTM E 988-96

(13) Accuracy and Ambient Temperature Effects are tested and verified down to -51° C (-60° F) for LT option.

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Transmitter Accuracy Example

When using a Pt 100 ($\alpha = 0.00385$) sensor input with a 0 to 100 °C span, use the greater of the two calculated values. In this case the accuracy would be ± 0.2 °C.

Transmitter Temperature Effects Example

Transmitters can be installed in locations where the ambient temperature is between -40 and 85 °C (-40 and 185 °F). In order to maintain excellent accuracy performance, each transmitter is individually characterized over this ambient temperature range at the factory.

When using a Pt 100 ($\alpha = 0.00385$) sensor input with a 0–100 °C span at 30 °C ambient temperature:

- Temperature Effects: 0.006 °C \times (30 - 20) = 0.06 °C

Total Transmitter Error

Worst Case Transmitter Error: Accuracy + Temperature Effects = 0.2 °C + 0.06 °C = 0.26 °C

Total Probable Transmitter Error: $\sqrt{0.2^2 + 0.06^2} = 0.21$ °C

Sensor Specifications

THERMOCOUPLES – IEC 584

Applicable to sensors offered in Table 13 on page 12 and Table 14 on page 14

Construction

Rosemount DIN plate and 1/2-in. adapter style thermocouples are manufactured from selected materials to meet IEC 584 Tolerance Class 1. The junction of these wires is laser-welded to form a pure joint, maintaining circuit integrity and ensuring highest accuracy.

Lead Wires

Internal – 18 SWG (16 AWG) solid wire (max), 19 SWG (18 AWG) solid wire (min.). External extension leads, type J and K – 0.8 mm minimum stranded wire, PTFE insulation. Color coded per IEC 584

Insulation Resistance

1000 Megaohms minimum insulation resistance when measured at 500 V dc at room temperature.

TABLE 3. Characteristics of DIN Plate and 1/2-in. NPT Adapter Style Thermocouples

Characteristics	Type J	Type K
Alloys (wire color)	Fe (+ black), CuNi (- white)	NiCr (+ green), NiAl (- white)
Temp Range	– 40 to 750° C (40 to 1382 °F)	– 40 to 1000° C (40 to 1832 °F)
Tolerance, DIN EN 60584-2	±1.5 °C or ±0.4% of measured temp, whichever is greater	
Sheath Material	1.4541 (AISI 321)	Inconel® 600

THERMOCOUPLES – ASTM E 230

Applicable to sensors offered in Table 15 on page 16

Construction

Rosemount 1/2-in. adapter style thermocouples are manufactured using ISA Type J or K wire with special limits of error accuracy. The junction of these wires is fusion-welded to form a pure joint, to maintain the integrity of the circuit and to ensure the highest accuracy.

Lead Wires

Thermocouple, internal – 16 AWG solid wire (max), 18 AWG solid wire (min.). External lead wire – 20 AWG wire, PTFE insulation. Color coded per ASTM E-230

Insulation Resistance

100 Megaohms minimum insulation resistance when measured at 100 V dc at room temperature.

TABLE 4. Characteristics of DIN Plate and 1/2-in. NPT Adapter Style Thermocouples

Characteristics	Type J	Type K
Alloys (wire color)	Iron/Constantan (white/red)	Chromel/Alumel (yellow/red)
Sheath Material	304 SST	Inconel
Temp Range	0 to 760 °C (32 to 1400 °F)	0 to 1150°C (32 to 2102 °F)
Tolerance	±1.1 °C or ±0.4% of measured temp, whichever is greater	

RTDs

Sensor Type

100 ohm RTD at 0 °C, $\alpha = 0.00385$ ohms/ohm/°C.

Accuracy

Meets IEC 751 Class B tolerances

Temperature Range

–50 to 450 °C (–58 to 842 °F)

Self Heating

0.15 °K/mW when measured per method defined in DIN EN 60751:1996 or 16 mW minimum power dissipation required to cause a 1 °C (1.8 °F) temperature measurement error in water flowing at 0.91 m/s (3 ft/s)

Thermal Response Time

9 seconds maximum required to reach 50% sensor response when tested in flowing water according to IEC 751 or 12 seconds maximum required to reach 63.2% sensor response in water flowing at 0.91 m/s (3 ft/s).

Immersion Error

60 mm minimum usable depth of immersion when tested according to IEC 751.

Insulation Resistance

500 Megaohms minimum insulation resistance when measured at 500 V dc at room temperature.

Sheath Material

321 SST with mineral-insulated cable construction.

Lead Wires

PTFE insulated, coated 22 gauge stranded copper wire.

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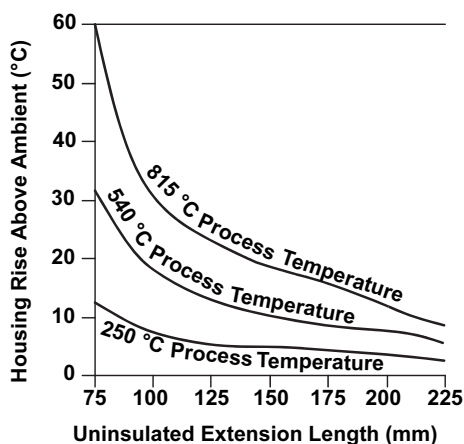
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Choosing an Extension and a Thermowell

Aside from ambient temperature variations, heat from the process, in a direct mounting configuration, is transferred from the thermowell to the transmitter housing. If the expected process temperature is near or beyond the transmitter specification limits, consider the use of additional thermowell extension length, an extension nipple, or a remote mounting configuration to isolate the transmitter from these excessive temperatures. Figure 1 provides an example of the relationship between transmitter housing temperature rise and extension length. Use Figure 1 and the accompanying example as a guide for determining adequate thermowell extension length.

FIGURE 1. Transmitter Housing Temperature Rise vs. Uninsulated Extension Length for a Test Installation



Example

The rated ambient temperature specification for the transmitter is 85 °C. If the maximum ambient temperature is 40 °C and the temperature to be measured is 540 °C, the maximum allowable housing temperature rise is the rated temperature specification limit minus the existing ambient temperature (85 – 40), or 45 °C.

As shown in Figure 1, an Uninsulated Extension Length of 90 mm will result in a housing temperature rise of 22 °C. An Uninsulated Extension Length of 100 mm would therefore be the minimum recommended length, and would provide a safety factor of about 25 °C. A longer Uninsulated Extension Length, such as 150 mm, would be desirable in order to reduce errors caused by transmitter temperature effect, although in that case the transmitter may require extra support.

THERMOWELLS

Materials

Barstock Thermowells: 316L SST (1.4404)

Tubular Thermowells: 1.4571 (316 Ti)

Stem Style

Barstock Thermowells: Tapered

Tubular Thermowells: Stepped

Construction

Thermowell bodies are either machined from solid barstock or manufactured using swaged tubes. Flange mounts are seal welded to the thermowell body with the exception of Class 900 flanges and above, which are full penetration welded. Surface finish of machined stems is 0.8 μm (32 $\mu\text{in. CLA.N6}$).

Material certification (option code Q8) and pressure testing (option code R01) are available. Flanged thermowells generally conform to the specifications of ASME B 16.5 (ANSI), DIN 2519, 2527, 2633, 2635, and DIN 2526 Type C

Other thermowell materials and styles are available in Volume 1, 2, and 3 of the Temperature Sensor and Accessories Product Data Sheet.

Product Certifications

APPROVED MANUFACTURING LOCATIONS

Rosemount Inc. – Chanhassen, Minnesota, USA
Emerson Process Management Temperature GmbH – Germany
Emerson Process Management Asia Pacific – Singapore

EUROPEAN UNION DIRECTIVE INFORMATION

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at www.rosemount.com. A hard copy may be obtained by contacting your local sales representative.

ATEX Directive (94/9/EC)

Rosemount Inc. complies with the ATEX Directive.

Electro Magnetic Compatibility (EMC) (89/336/EEC)

All Models: EN 50081-1: 1992; EN 50082-2:1995;
EN 61326-1: 2006

CE Mark

The 248 meets all requirements listed under IEC 61326:Amendment 1,2006

HAZARDOUS LOCATIONS CERTIFICATIONS⁽¹⁾

North American Certifications

Factory Mutual (FM)

- I5 FM Intrinsic Safety and Non-incendive Intrinsically Safe for Class I/II/III, Division 1, Groups A, B, C, D, E, F, and G. Non-incendive Field Circuit for Class I, Division 2, Groups A, B, C, and D. Intrinsically Safe and non-incendive when installed in accordance with Rosemount drawing 00248-1055.

Temperature Codes:

T5 ($T_{amb} = -50$ to 75°C)

T6 ($T_{amb} = -50$ to 40°C)

TABLE 5. Entity Parameters

Loop/Power	Sensor
$U_i = 30\text{ Vdc}$	$U_o = 45\text{ Vdc}$
$I_i = 130\text{ mA}$	$I_o = 26\text{ mA}$
$P_i = 1.0\text{ W}$	$P_o = 290\text{ mW}$
$C_i = 3.6\text{ nF}$	$C_o = 0.4\text{ nF}$
$L_i = 13.8\text{ }\mu\text{H}$	$L_o = 49.2\text{ mH}$

- E5 FM Explosion-Proof
Explosion-Proof for Class I, Division 1, Groups B, C, and D.
Dust Ignition Proof for Class II/III, Division 1, Groups E, F, G when installed in accordance with Rosemount drawing 00248-1065.

Temperature Code:

T5 ($T_{amb} = -40$ to 85°C)

Combination Certifications

- K5 Combination of I5 and E5.

Canadian Standards Association (CSA) Approvals

- I6 CSA Intrinsically Safe and Class I, Division 2
Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D when installed in accordance with Rosemount drawing 00248-1056.

Temperature Codes:

T5 ($T_{amb} = -50$ to 60°C)


T6 ($T_{amb} = -50$ to 40°C)

Suitable for use in Class I, Division 2, Groups A, B, C, and D.

- K6 CSA Intrinsically Safe, Explosion-Proof, and Class I, Division 2.
Combination of I6 and Explosion-Proof for Class I, Division 1, Groups B, C, and D; Class II, Division 1, Groups E, F, and G; Class III, Division 1 hazardous locations, when installed in accordance with Rosemount drawing 00644-1059.

Suitable for Class I, Division 2, Groups A,B, C, and D.
Ambient Temperature Limit: -50 to 85°C

European Certifications

- I1 ATEX Intrinsic Safety
Certificate Number: Baseefa03ATEX0030X
ATEX Marking:  II 1 G
CE 1180
Ex ia IIC

Temperature Codes:

T5 ($-60 \leq T_{amb} \leq 80^{\circ}\text{C}$)

T6 ($-60 \leq T_{amb} \leq 60^{\circ}\text{C}$)

TABLE 6. Entity Parameters

Loop/Power	Sensor
$U_i = 30\text{ Vdc}$	$U_o = 45\text{ Vdc}$
$I_i = 130\text{ mA}$	$I_o = 26\text{ mA}$
$P_i = 1.0\text{ W}$	$P_o = 290\text{ mW}$
$C_i = 3.6\text{ nF}$	$C_i = 2.1\text{ nF}$
$L_i = 0$	$L_i = 0$

Special Conditions for Safe Use (X):

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 GOHM ; light alloy or zirconium enclosures must be protected from impact and friction when installed.


(1) Consult factory for availability.

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E1 ATEX Flame-Proof
Certificate Number: KEMA99ATEX8715

ATEX Marking:  II 2 G

CE 1180

EEx d IIC

TABLE 7. Input Parameters


$U_{max} = 42.4 \text{ Vdc}$

$I_{max} = 24 \text{ mA}$

Temperature Codes:

T6 ($-40 \leq T_{amb} \leq 65 \text{ }^{\circ}\text{C}$)

N1 ATEX Type n
Certificate Number: BAS00ATEX3145

ATEX Marking:  II 3

EEx nL IIC


TABLE 8. Input Parameters

$U_{max} = 45 \text{ V}$

Temperature Codes:

T5 ($-40 \leq T_{amb} \leq 70 \text{ }^{\circ}\text{C}$)

NC ATEX Type n Component
Certificate Number: Baseefa03ATEX0032U

ATEX Marking:  II 3 G

EEx nA IIC

TABLE 9. Input Parameters

$U_i = 42.4 \text{ V}$

$C_i = 3.6 \text{ nF}$

$L_i = 0$

Temperature Codes:

T5 ($-60 \leq T_{amb} \leq 80 \text{ }^{\circ}\text{C}$)

T6 ($-60 \leq T_{amb} \leq 60 \text{ }^{\circ}\text{C}$)

ND ATEX Dust Ignition Proof
Certificate Number: KEMA99ATEX8715

ATEX Marking: II 1 D

CE 1180

T95 C ($-40 \leq T_{amb} \leq 85 \text{ }^{\circ}\text{C}$)

IP66

TABLE 10. Input Parameters

$U_{max} = 42.4 \text{ Vdc}$

$I_{max} = 24 \text{ mA}$

Australian Certifications

Standard Australia Quality Assurance Service
(SAA) Approvals

E7 SAA Explosion-Proof
Certificate Number: AUS Ex 3706X

Ex d IIC

Temperature Codes:

T6 ($-40 \leq T_{amb} \leq 65 \text{ }^{\circ}\text{C}$)

Special Conditions for Safe Use (X):

1. A thermowell must be utilized on installations incorporating a DIN style or a spring loaded sensor assembly, with all threaded connections sealed with sealing tape to maintain the IP rating of IP66/IP68 (3 meters).
2. When a gland is utilized on installation, the gland must be Standards Australia certified and must be capable of maintaining the IP rating. This also requires the use of thread sealing tape on all gland entries.

Brazilian Certifications

Centro de Pesquisas de Energia Eletrica
(CEPEL) Approval

I2 CEPEL Intrinsic Safety

IECEx Certifications

I7 IECEx Intrinsic Safety (Zone 0)
Certificate Number: TSA IECEx 04.0004X
Ex ia IIC

Temperature Codes:

T5 ($T_{amb} = -60 \text{ }^{\circ}\text{C}$ to $80 \text{ }^{\circ}\text{C}$)

T6 ($T_{amb} = -60 \text{ }^{\circ}\text{C}$ to $40 \text{ }^{\circ}\text{C}$)

TABLE 11. Entity Parameters

Ex ia Terminals \pm	Sensor
$U_i = 30 \text{ Vdc}$	$U_o = 45 \text{ Vdc}$
$I_i = 130 \text{ mA}$	$I_o = 26 \text{ mA}$
$P_i = 1.0 \text{ W}$	$P_o = 290 \text{ mW}$
$C_i = 3.63 \text{ nF}$	$C_i = 10 \text{ nF}$
$L_i = 0 \text{ mH}$	$L_i = 26 \text{ mH}$

Conditions of Certification:

1. It is a condition of safe use that the input entity parameters must be taken into account when connecting to a supply. For sensor output terminals, the sensor entity parameters shall be taken into account during installation.
2. It is a condition of safe use that the apparatus shall only be supplied from a galvanically isolated safety barrier with output current limited by a minimum 225 Ohms resistor.
3. It is a condition of safe use that the transmitter must be mounted in an enclosure that suits Group IIC application and affords a degree of protection of at least IP20 for Ex ia version, and of at least IP54 for Ex n version.
4. It is a condition of safe use that the apparatus shall be installed according to the installation drawing 00248-1057.

N7 IECEx Type n (Zone 2)
Certificate Number: TSA IECEx 04.0004X
Ex n IIC

Temperature Codes:

T5 ($T_{amb} = -60 \text{ }^{\circ}\text{C}$ to $70 \text{ }^{\circ}\text{C}$)

T6 ($T_{amb} = -60 \text{ }^{\circ}\text{C}$ to $50 \text{ }^{\circ}\text{C}$)

TABLE 12. Ex n Input Parameters

Ex n Terminals \pm
$U_i = 45 \text{ V}$

GOST Certifications

Russian GOST

PPC 04-9788: (EP Only)

1 Ex d IIC T6

PPC BA-13006:

0 Ex ia IIC T5/T6

Kazakhstan GOST

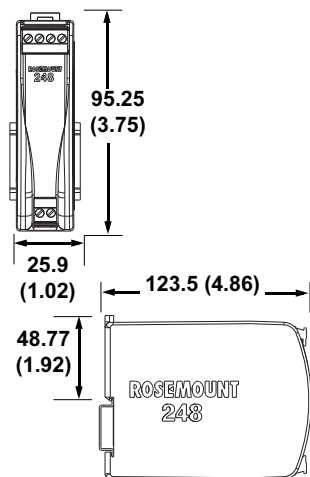
See Certificate

Ukraine GOST

See Certificate

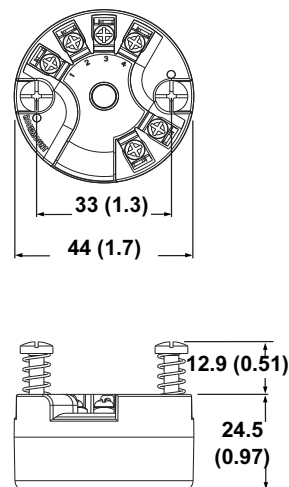
Dimensional Drawings

248R Railmount Transmitter



248H Headmount Transmitter

(enlarged)



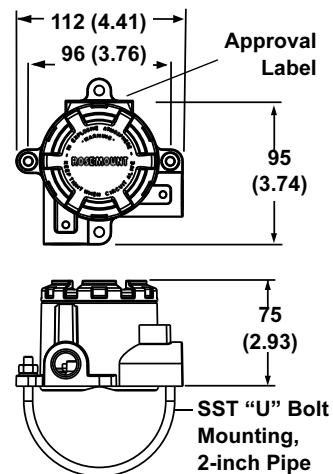
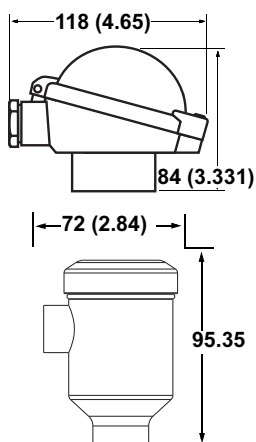
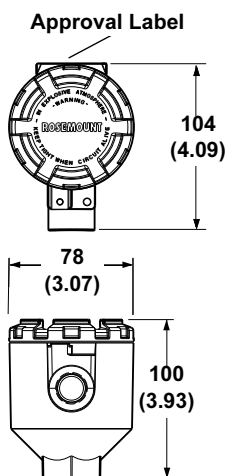
Dimensions are in millimeters (inches)

Enclosures

BUZ and Polypropylene Heads
(option codes B and C)
and Mini SST Head (option code S)

Universal Head⁽¹⁾
(option codes H and U)

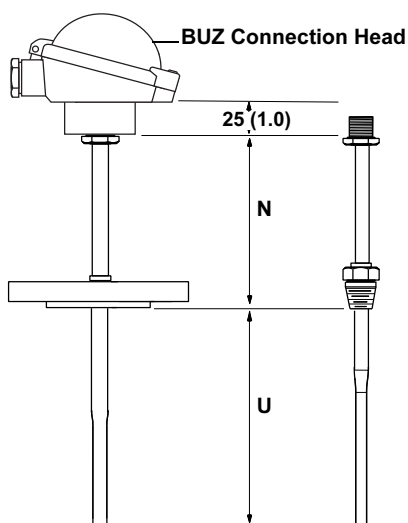
Connection Head



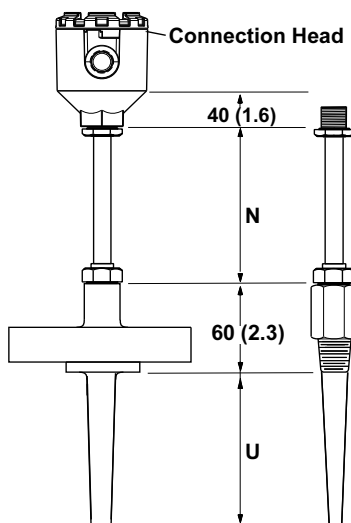
(1) A "U" Bolt is shipped with each universal head unless a sensor is ordered assembled to the enclosure. However, since the head can be integrally mounted to the sensor it may not need to be used.

Examples of 248 Transmitter and Sensor Assemblies with Thermowells

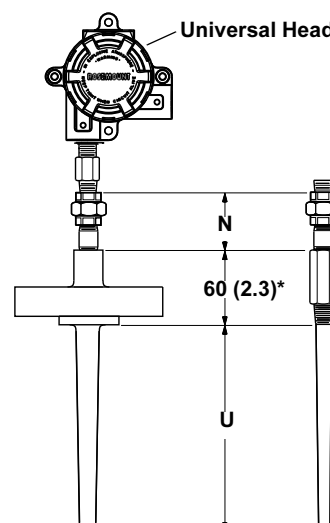
**Tubular Thermowell and
DIN Plate Style Sensor**



**Barstock Thermowell and
DIN Plate Style Sensor**



**Barstock Thermowell, Nipple-Union Extension,
and 1/2-in. NPT Spring Loaded Sensor**



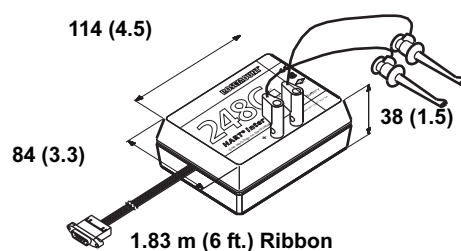
* 80 (3.2) for Class 900 flanges and larger

N = Extension Length, U= Thermowell Immersion Length, Dimensions are in millimeters (inches)

SEE ORDERING TABLES FOR MORE ASSEMBLY OPTIONS

248C Configuration Interface

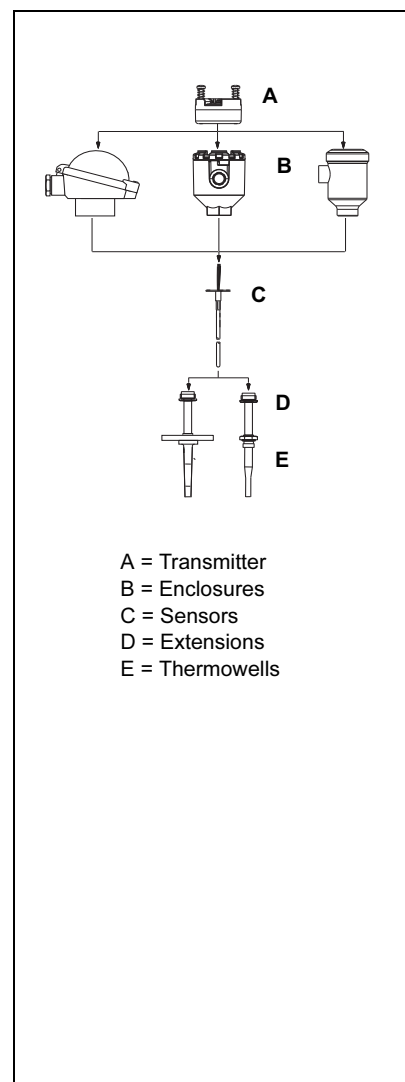
Option 1: HART Interface Box



248 Ordering Information

TABLE 13. With or without DIN Plate Style Sensor and Tubular Thermowells (millimeters)

Model	Product Description	
248H	Smart DIN B Head Mount Temperature Transmitter	
Code	Output Protocol	
A	4–20 mA with Digital Signal based on <i>HART</i> Protocol	
Code	Product Certifications	Enclosure Option Codes Permitted
Hazardous Area Certificates (consult factory for availability)		
I1	ATEX Intrinsic Safety	A, B, N, S, G
E1	ATEX Flameproof	A, G
N1	ATEX Type n	A, G
NC ⁽¹⁾	ATEX Type n Component	N
ND	ATEX Dust Ignition Proof	A, G
I5	FM Intrinsic Safety and Class I, Division 2	A, B, N, G
E5	FM Explosion-Proof	A, G
K5	FM Intrinsic Safety, Explosion-Proof, and Class I, Division 2	A, G
I6	CSA Intrinsic Safety and Class I, Division 2	A, B, N, G
K6	CSA Intrinsic Safety, Explosion-Proof, and Class I, Division 2	A
I7	IECEx Intrinsic Safety	A, B, N, G
E7	SAA Flameproof	A, G
N7	IECEx Type n	A, B, G
I2	CEPEL Intrinsic Safety	A, B, N, G
I4	TIIS Intrinsic Safety	A, B, N, G
E4	TIIS Flameproof	A, G
NA	No Approvals	A, B, N, C, S, G
Code	Enclosures	
A	Connection Head, DIN IP68, Aluminum	
B	BUZ Head, IP65, Aluminum	
C ⁽²⁾	BUZ Head, IP65, Polypropylene	
G	Connection Head, IP66/68, SST	
S ⁽²⁾	Sanitary Connection Head, Din B, IP66/68, Polished SST	
N	No Enclosure	
Code	Cable/Conduit Entry for Enclosures	
1	M20 x 1.5	
2 ⁽³⁾	1/2-inch NPT	
0	No Enclosure	



Code	Sensor Type	Style	Type
ZR	PT 100 RTD	DIN Plate	4-Wire, Single Element, IEC
ZJ	Type J Thermocouple	DIN Plate	Ungrounded, Single Element, IEC -40 to 750° C (40 to 1382° F)
ZK	Type K Thermocouple	DIN Plate	Ungrounded, Single Element, IEC -40 to 1000° C (40 to 1832° F)
XA ⁽⁴⁾	Sensor Specified Separately and Assembled to Transmitter	NA	NA
NS ⁽⁵⁾	No Sensor	NA	NA

continued on next page

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Rosemount 248

Table 13 continued

Code	Options
Extension Length	
N050	50 mm (1.97-in.)
N115	115 mm (4.53-in.)
N130	130 mm (5.12-in.)
Stepped Stem Tubular Thermowells, 1.4571 (316 Ti) NAMUR-Compliant	
G02	Thread Mount, 1/2-in. BSPT (R ^{1/2})
G04	Thread Mount, 3/4-in. BSPT (R ^{3/4})
G20	Thread Mount, 1/2-in. BSPF (G ^{1/2})
G22	Thread Mount, 3/4-in. BSPF (G ^{3/4})
G38	Thread Mount, 1/2-in. NPT
G40	Thread Mount, 3/4-in. NPT
L02	Thread Mount, 1-in. Class 150
H02	Flange Mount, DN25 PN16
H08	Flange Mount, DN25 PN25/40
H14	Flange Mount, DN40 PN16
Immersion Length	
U075	75 mm (2.95-in.)
U100	100 mm (3.94-in.)
U115	115 mm (4.53-in.)
U160	160 mm (6.30-in.)
U200	200 mm (7.87-in.)
U220	220 mm (8.66-in.)
U250	250 mm (9.84-in.)
U300	300 mm (11.8-in.)
U400	400 mm (15.7-in.)
Special Options	
C1	Factory Custom Configuration of Alarm and Saturation Levels, Date, Descriptor and Message Field
A1	Analog Output Levels Compliant with NAMUR-Recommendations, NE43: High Alarm
CN	Analog Output Levels Compliant with NAMUR-Recommendations, NE43: Low Alarm
C4	5-Point Calibration (Use option code Q4 option to generate a Calibration Certificate)
Q4	Transmitter Calibration Certificate 3-Point standard (use Codes C4 with Q4 for 5-point Calibration Certificate)
F6	60 Hz line Voltage Filter
Q8	Thermowell Material Certificate
R01	Thermowell External Pressure Test
GE ⁽⁶⁾⁽²⁾	M12, 4 pin, Male Connector (eurofast [®])
GM ⁽⁶⁾⁽²⁾	A-size Mini, 4 pin, Male Connector (minifast [®])
Typical Model Number: 248H A E1 A 1 ZR N050 G22 U160 Q4	

Additional Options Available

This data sheet contains a sample of the many temperature assembly options Emerson Process Management has available. Refer to the following product data sheets or contact a sales representative for more choices.

- Temperature Sensor and Accessories, Volume 1 (Doc. No. 00813-0100-2654)
- Temperature Sensor and Accessories, Metric Sensors (Doc. No. 00813-0200-2654)

(1) The 248H with ATEX Type n Component Approval is not approved as a stand alone unit. Additional system certification is required. Transmitters must be installed such that it is protected to at least the requirements of IP54.

(2) Consult factory for availability.

(3) A 1/2-in. thread adapter is used when Enclosure option code B is ordered with Sensor Type option codes ZR, ZJ, or ZK.

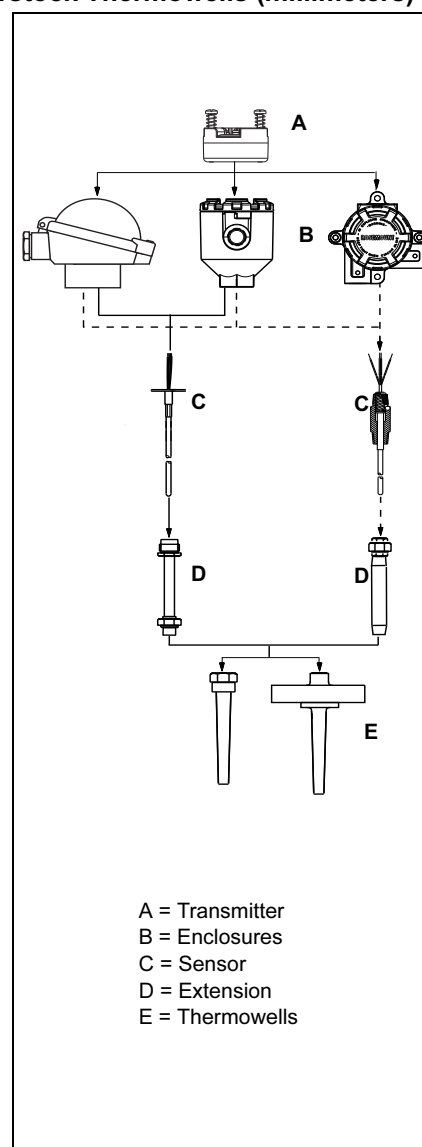
(4) Only specify this code if the sensor assembly is ordered though a separate model number (from one of the Sensor Product Data Sheets).

(5) Only available with Enclosure option code N.

(6) Available with Intrinsically Safe approvals only. For FM Intrinsically Safe or non-incendive approval (option code I5), install in accordance with Rosemount drawing 03151-1009 to maintain NEMA 4X rating.

TABLE 14. With or without DIN Plate or 1/2-in. Adapter Style Sensor and Barstock Thermowells (millimeters)

Model	Product Description	
248H	Smart DIN B Head Mount Temperature Transmitter	
Code	Output Protocol	
A	4–20 mA with Digital Signal based on <i>HART</i> Protocol	
Code	Product Certifications	Enclosure Options Codes Permitted
Hazardous Area Certificates (consult factory for availability)		
I1	ATEX Intrinsic Safety	A, B, U, N, G, S, H
E1	ATEX Flameproof	A, U, G, H
N1	ATEX Type n	A, U, G, H
NC ⁽¹⁾	ATEX Type n Component	N
ND	ATEX Dust Ignition Proof	A, U, G, H
I5	FM Intrinsic Safety and Class I, Division 2	A, B, U, N, G, H
E5	FM Explosion-Proof	A, U, G, H
K5	FM Intrinsic Safety, Explosion-Proof, and Class I, Division 2	A, U, G, H
I6	CSA Intrinsic Safety and Class I, Division 2	A, B, U, N, G, H
K6	CSA Intrinsic Safety, Explosion-Proof, and Class I, Division 2	A, U, G, H
I7	IECEX Intrinsic Safety	A, B, U, N, G, H
E7	SAA Flameproof	A, U, G, H
N7	IECEX Type n	A, B, U, G, H
I2	CEPEL Intrinsic Safety	A, B, U, N, G, H
I4	TIIS Intrinsic Safety	A, B, U, N, G, H
E4	TIIS Flameproof	A, U, G, H
NA	No Approvals	A, B, U, N, C, G, S, H
Code	Enclosures	
A	Connection Head, DIN IP68, Aluminum	
B	BUZ Head, IP65, Aluminum	
C ⁽²⁾	BUZ Head, IP65, Polypropylene	
G	Connection Head, DIN IP66/68, SST	
H	Universal Head (Junction Box), IP66/68, SST	
S ⁽²⁾	Sanitary Connection Head, DIN B, IP66/68, Polished SST	
U ⁽³⁾	Universal Head (Junction Box), IP66/68, Aluminum	
N	No Enclosure	
Code	Cable/Conduit Entry for Enclosure	
1 ⁽⁴⁾	M20 x 1.5	
2 ⁽⁵⁾	1/2-inch NPT	
0	No Enclosure	
Code	Sensor Type	Style
DR	PT 100 RTD	DIN Plate
DJ	Type J Thermocouple	DIN Plate
DK	Type K Thermocouple	DIN Plate
AR	PT 100 RTD	1/2-in. Adapter, Spring Loaded
AJ	Type J Thermocouple	1/2-in. Adapter, Spring Loaded
AK	Type K Thermocouple	1/2-in. Adapter, Spring Loaded
XA ⁽⁶⁾	Sensor Specified Separately and Assembled to Transmitter	NA
NS ⁽⁷⁾	No Sensor	NA



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Table 14 continued

Code	Options
Extension Length	
N035 ⁽⁸⁾	35 mm (1.38-in.)
N080	80 mm (3.15-in.)
N110	110 mm (4.33-in.)
N135	135 mm (5.32-in.)
N150	150 mm (5.90-in.)
Tapered Barstock Thermowell Process Connection, 316L (1.4404)	
T08	Thread Mount, 1/2-in. BSPT (R ^{1/2})
T10	Thread Mount, 3/4-in. BSPT (R ^{3/4})
T26	Thread Mount, 1/2-in. BSPF (G ^{1/2})
T28	Thread Mount, 3/4-in. BSPF (G ^{3/4})
T44	Thread Mount, 1/2-in. NPT
T46	Thread Mount, 3/4-in. NPT
T48	Thread Mount, 1-inch NPT
T90	Thread Mount, M24 x 1.5
T98	Thread Mount, M20 x 1.5
F04	Flange Mount, 1-in. Class 150
F10	Flange Mount, 1 1/2-in. Class 150
F16	Flange Mount, 2-in. Class 150
F28	Flange Mount, 1 1/2-in. Class 300
F46	Flange Mount, 1 1/2-in. Class 600
F64 ⁽⁹⁾	Flange Mount, 1/2-in. Class 900/1500
D04	Flange Mount, DN25 PN16
D10	Flange Mount, DN25 PN25/40
D16	Flange Mount, DN40 PN16
Immersion Length	
U075	75 mm (2.95-in.)
U100	100 mm (3.94-in.)
U150	150 mm (5.91-in.)
U225	225 mm (8.86-in.)
U250	250 mm (9.84-in.)
U300	300 mm (11.8-in.)
Special Options	
C1	Factory Custom Configuration of Alarm and Saturation Levels, Date, Descriptor and Message Field
A1	Analog Output Levels Compliant with NAMUR-Recommendations, NE43: High Alarm
CN	Analog Output Levels Compliant with NAMUR-Recommendations, NE43: Low Alarm
C4	5-Point Calibration (Use option code Q4 to generate a calibration certificate)
Q4	Calibration Certificate (3-Point standard; use option codes C4 with Q4 for a 5-Point Calibration Certificate)
F6	60 Hz line Voltage Filter
Q8	Thermowell Material Certificate
R01	Thermowell External Pressure Test
GE ⁽¹⁰⁾⁽²⁾	M12, 4 pin, Male Connector (eurofast [®])
GM ⁽⁹⁾⁽²⁾	A-size Mini, 4 pin, Male Connector (minifast [®])
Typical Model Number: 248H A I1 A 1 DR N080 T08 U250 CN	

Additional Options Available

This data sheet contains a sample of the many temperature assembly options Emerson Process Management has available. Refer to the following product data sheets or contact a sales representative for more choices.

- Temperature Sensor and Accessories, Volume 1 (Doc. No. 00813-0100-2654)
- Temperature Sensor and Accessories, Metric Sensors (Doc. No. 00813-0200-2654)

(1) The 248H with ATEX Type n Component Approval is not approved as a stand alone unit, additional system certification is required. Transmitter must be installed so it is protected to at least the requirements of IP54.

(2) Consult factory for availability.

(3) Enclosure option code U cannot be used with Sensor Type Option codes DR, DJ, or DK.

(4) An M20 x 1.5 thread adapter is used when Enclosure Option Code U is ordered with Sensor Type Option Codes AR, AJ, or Ak.

(5) A 1/2 in. thread adapter is used when Enclosure Option B is ordered.

(6) Only specify this Code if the Sensor Assembly is ordered through a separate Model Number (from one of the Sensor Product Data Sheets).

(7) Only available with Enclosure Option Codes N or U.

(8) Extension Code N035 is only valid with Sensor Type Codes DR, DJ, and DK (Nipple Union is not valid with 35 mm length).

(9) Thermowell flange will be welded with a full penetration weld.

(10) Available with Intrinsically Safe approvals only for FM Intrinsically Safe or Non-Incendive approval (Option Code I5). To maintain NEMA 4X rating, it must be installed according to Rosemount Drawing 03151-1009.

TABLE 15. With or without 1/2-in. NPT Spring Loaded Sensor and Barstock Thermowells (inches)

Model	Product Description
248H	Smart DIN B Head Mount Temperature Transmitter
Code	Output Protocol
A	4–20 mA with Digital Signal based on <i>HART</i> Protocol

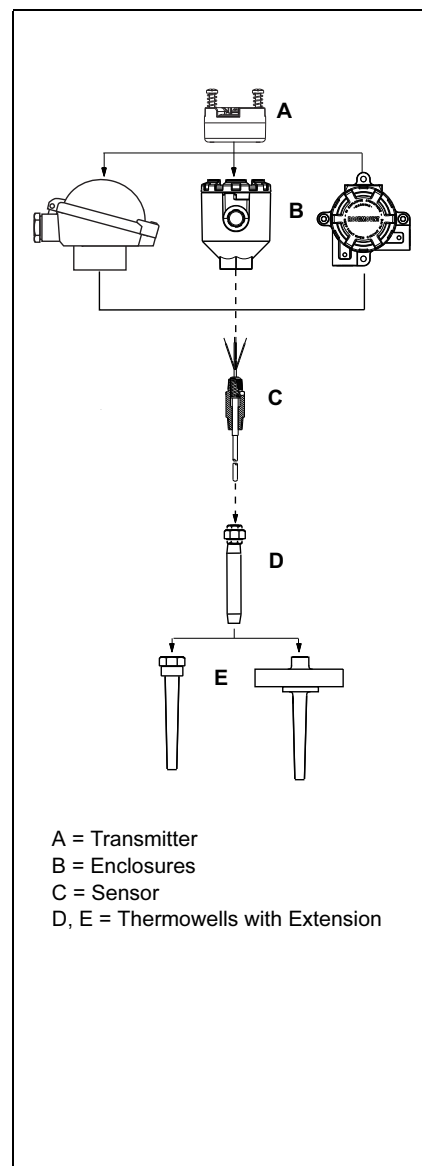
Code	Product Certifications	Enclosure Options Codes Permitted
Hazardous Area Certificates (consult factory for availability)		
I1	ATEX Intrinsic Safety	A, B, U, N, G, S, H
E1	ATEX Flame-Proof	A, U, G, H
N1	ATEX Type n	A, U, G, H
NC ⁽¹⁾	ATEX Type n Component	N
ND	ATEX Dust Ignition Proof	A, U, G, H
I5	FM Intrinsic Safety and Class I, Division 2	A, B, U, N, G, H
E5	FM Explosion-Proof	A, U, G, H
K5	FM Intrinsic Safety, Explosion-Proof, and Class I, Division 2	A, U, G, H
I6	CSA Intrinsic Safety and Class I, Division 2	A, B, U, N, G, H
K6	CSA Intrinsic Safety, Explosion-Proof, and Class I, Division 2	A, U, G, H
I7	IECEx Intrinsic Safety	A, B, U, N, G, H
E7	SAA Flame-Proof	A, U, G, H
N7	IECEx Type n	A, B, U, G, H
I2	CEPEL Intrinsic Safety	A, B, U, N, G, H
I4	TIIS Intrinsic Safety	A, B, U, N, G, H
E4	TIIS Flame-Proof	A, U, G, H
NA	No Approvals	A, B, U, N, C, G, S, H

Code	Enclosures
A	Connection Head, IP66/68, Aluminum
B	BUZ Head, IP65, Aluminum
C ⁽²⁾	BUZ Head, IP65, Polypropylene
G	Connection Head, IP 66/68, SST
H	Universal Head (Junction Box), IP66/68, SST
S ⁽²⁾	Sanitary Connection Head, DIN B IP66/68, Polished SST
U ⁽³⁾	Universal Head (Junction Box), IP66/68, Aluminum
N	No Enclosure

Code	Cable/Conduit Entry
2	1/2-inch NPT
0	No Enclosure

Code	Sensor Type	Style	Type
UR	PT 100 RTD	1/2-in. Adapter, Spring Loaded	4-Wire, Single Element, IEC
UJ	Type J Thermocouple	1/2-in. Adapter, Spring Loaded	Ungrounded, Single Element, ASTM 0 to 760° C (32 to 1400° F)
UK	Type K Thermocouple	1/2-in. Adapter, Spring Loaded	Ungrounded, Single Element, ASTM 0 to 1150° C (32 to 2102° F)
XA ⁽⁴⁾	Sensor Specified Separately and Assembled to the Transmitter		NA
NS	No Sensor	NA	NA

continued on next page



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Rosemount 248

Table 15 continued

Code	Options
Extension Length	
N003	3-in. (76.2 mm)
N006	6-in. (152.4 mm)
Tapered Barstock Thermowell Process Connection, 316L (1.4404)	
T25	Thread Mount, $\frac{3}{4}$ -in. NPT
T27	Thread Mount, 1-in. NPT
F58	Flange Mount, 1-in. Class 150
F60	Flange Mount, 1 $\frac{1}{2}$ -in. Class 150
F62	Flange Mount, 2-in. Class 150
F78	Flange Mount, 1 $\frac{1}{2}$ -in. Class 300
F96	Flange Mount, 1 $\frac{1}{2}$ -in. Class 600
F34	Flange Mount, 1 $\frac{1}{2}$ -in. Class 900/1500 ⁽⁵⁾
Immersion Length (Lagging length is 0.5-in)	
U002	2-in. (50.8 mm)
U003	3-in. (76.2 mm)
U004	4-in. (101.6 mm)
U005	5-in. (127 mm)
U006	6-in. (152.4 mm)
U007	7-in. (177.8 mm)
U008	8-in. (203.2 mm)
U009	9-in. (228.6 mm)
U010	10-in. (254 mm)
U012	12-in. (304.8 mm)
U015	15-in. (381 mm)
U018	18-in. (457.2 mm)
Special Options	
C1	Factory Custom Configuration of Alarm and Saturation Levels, Date, Descriptor and Message Field
A1	Analog Output Levels Compliant with NAMUR-Recommendations, NE43: High Alarm
CN	Analog Output Levels Compliant with NAMUR-Recommendations, NE43: Low Alarm
C4	5-Point Calibration (Use option code Q4 to generate a calibration certificate)
Q4	Calibration Certificate (3-Point standard; use option codes C4 with Q4 for a 5-Point Calibration Certificate)
F6	60 Hz line Voltage Filter
Q8	Thermowell Material Certificate
R01	Thermowell External Pressure Test
GE ⁽⁶⁾⁽²⁾	M12, 4 pin, Male Connector (eurofast [®])
GM ⁽⁶⁾⁽²⁾	A-size Mini, 4 pin, Male Connector (minifast [®])
Typical Model Number: 248H A K5 U 2 UR N003 T25 U004 F6	

Additional Options Available

This data sheet contains a sample of the many temperature assembly options Emerson Process Management has available. Refer to the following product data sheets or contact a sales representative for more choices.

- Temperature Sensor and Accessories, Volume 1 (Doc. No. 00813-0100-2654)
- Temperature Sensor and Accessories, Metric Sensors (Doc. No. 00813-0200-2654)

(1) The 248H with ATEX Type n Component Approval is not approved as a stand alone unit. Additional system certification is required. Transmitters must be installed such that it is protected to at least the requirements of IP54.

(2) Consult factory for availability.

(3) Enclosure option code U cannot be used with Sensor Type option codes DR, DJ, or DK.

(4) Only specify this code if the sensor assembly is ordered though a separate model number (from one of the Sensor Product Data Sheets).

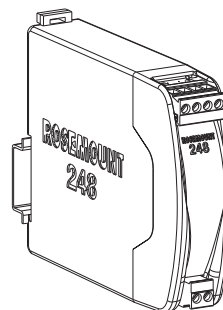
(5) Thermowell flange will be welded with a full penetration weld.

(6) Available with Intrinsically Safe approvals only. For FM Intrinsically Safe or non-incendive approval (option code I5), install in accordance with Rosemount drawing 03151-1009 to maintain NEMA 4X rating.

TABLE 16. 248R Railmount Transmitter

Model	Product Description
248R	Smart DIN Rail Mount Temperature Transmitter
Code	Output Protocol
A	4-20mA with Digital Signal based on HART Protocol
Code	Product Certifications
I1	ATEX Intrinsic Safety
NC	ATEX Type n Component
I5	FM Intrinsic Safety and Class I, Division 2
I6	CSA Intrinsic Safety and Class I, Division 2
I7 ⁽¹⁾	IECEX Intrinsic Safety
I2 ⁽¹⁾	CEPEL Intrinsic Safety
I4 ⁽¹⁾	TIIS Intrinsic Safety
NA	No Approvals
Code	Options
Special Options	
C1	Factory Customer Configuration of Alarm and Saturation Levels, Date, Descriptor and Message Field
A1	Analog Output Levels Compliant with NAMUR-Recommendations, NE43: High Alarm
CN	Analog Output Levels Compliant with NAMUR-Recommendations, NE43: Low Alarm
C4	5-Point Calibration (Use option code Q4 to generate a calibration certificate)
Q4	Calibration Certificate (3-Point standard; use option codes C4 with Q4 for a 5-Point Calibration Certificate)
F6	60 Hz Line Voltage Filter
Typical Model Number: 248R A I1 Q4	

(1) Consult Factory for availability



248C Configuration Interface Specifications

CONFIGURATION SOFTWARE

The 248C PC-based configuration software for the Rosemount 248 allows comprehensive configuration of the transmitters. Used in conjunction with various Rosemount or user-supplied hardware modems, the software provides the tools necessary to configure the 248 transmitters including the following parameters:

- Process Variable
- Sensor Type
- Number of Wires
- Engineering Units
- Transmitter Tag Information
- Damping
- Alarming Parameters

CONFIGURATION HARDWARE

The 248C Configuration Interface has 4 hardware options as follows:

Option “0”: Software Only

Customer must provide appropriate communications hardware (modem, power supply, etc.).

Option “1”: HART Interface Box

HART interface box including an integrated serial modem and battery-powered transmitter power supply. Only suitable for off-line transmitter configuration. Requires PC serial port. *Will not work with powered loops.*

Option “2”: Serial HART Modem

Serial HART modem. Customer must provide separate loop power supply and resistor. Requires PC serial port. *Suitable for use with powered loops.*

Option “3”: USB HART Modem

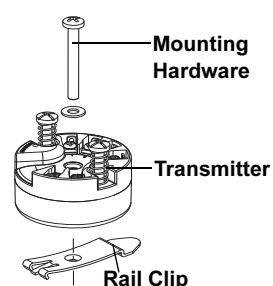
USB (Universal Serial Bus) HART modem. Customer must provide separate loop power supply and resistor. Requires PC with USB port. *Suitable for use with powered loops.*

TABLE 17. 248C Configuration Interface

Model	Product Description
248C ⁽¹⁾	PC-based HART Configuration Software
Code	Communications Hardware Options
0	Software Only (no Modem))
1	Software with 248C HART Interface Box (Serial Interface with Transmitter Power Supply)
2	Software with Serial HART Modem
3	Software with USB HART Modem
Typical Model Number: 248C 1	

(1) Consult Factory for availability

TABLE 18. 248 Transmitter Accessories



Part Description	Part Number
Aluminum Alloy Universal Head – M20 Entries	00644-4420-0002
Aluminum Alloy Universal Head – 1/2 NPT Entries	00644-4420-0001
Aluminum Alloy Rosemount Connection Head – M20 Conduit Entry, M24 Instrument Entry	00644-4410-0023
Aluminum Alloy Rosemount Connection Head – 1/2 NPT Conduit Entry and M24 Instrument Entry	00644-4410-0013
Aluminum Alloy BUZ Head – M20 Conduit Entry, M24 Instrument Entry	00644-4196-0023
Aluminum Alloy BUZ Head – M20 Conduit Entry and 1/2 NPT Instrument Entry	00644-4196-0021
Aluminum Alloy BUZ Head – 1/2 NPT Conduit Entry	00644-4196-0011
External Ground Screw Assembly Kit	00644-4431-0001
Kit, Hardware for Mounting a 248 to a DIN Rail (see left picture-top hat rail, symmetric)	00248-1601-0001
Standard Cover for Universal or Rosemount Connection Heads	03031-0292-0001
Snap Rings Kit (used for assembly to DIN Plate Style sensor)	00644-4432-0001

Hardware Tag

- no charge
- 20 characters maximum
- transmitter enclosure, sensor, and thermowell if applicable will be tagged in accordance with customer requirements

Software Tag

- no charge
- the transmitter can store up to 8 characters. If no characters are specified, the first 8 characters of the hardware tag are the default.

Configuration

When ordering a transmitter and sensor assembly in one model number, the transmitter will be configured for the sensor that is ordered.

When a transmitter is ordered alone, the transmitter will be shipped as follows (unless specified):

Sensor Type	RTD, Pt 100 ($\alpha=0.00385$, 4-wire)
4 mA Value	0 °C
20 mA Value	100 °C
Damping	5 seconds
Output	Linear with temperature
Failure Mode	High/Upscale
Line Voltage Filter	50 Hz
Tag	See Hardware Tag

Options

The following table lists the requirements necessary to specify a custom configuration.

Option Code	Requirements/ Specification
C1: Factory Configuration Data (CDS required)	Date: day/month/year Descriptor: 16 alphanumeric characters Message: 32 alphanumeric character Analog Output: Alarm and saturation levels
A1: NAMUR-Compliant, High Alarm	See Table 1 on page 2
CN: NAMUR-Compliant, Low Alarm	See Table 1 on page 2
Q4: Calibration Certificate	Will include 3-Point calibration at 0, 50, and 100% analog and digital output points
C4: Five Point Calibration	Will include 5-point calibration at 0, 25, 50, 75, and 100% analog and digital output points. Use with Calibration Certificate Q4.
F6: 60 Hz Line Filter	Calibrated to a 60 Hz line voltage filter instead of 50 Hz filter

Configuration Data Sheet

Customer Information

Customer _____

P.O. No. _____

Model No. _____

Line Item _____

Input-Output Information (software selectable)

Sensor Type

- ☐ **Pt 100 α = 0.00385 ★**
☐ Pt 100 α = 0.003916
☐ Pt 200 α = 0.00385
☐ Pt 500 α = 0.00385
☐ Pt 1000 α = 0.00385
☐ Cu 10
☐ Ni 120
☐ Ohms

No. of Leads

- ☐ 2-Wire
☐ 3-Wire
☐ **4-Wire**

- ☐ NIST Type B T/C
☐ NIST Type E T/C
☐ NIST Type J T/C
☐ NIST Type K T/C
☐ NIST Type N T/C
☐ NIST Type R T/C
☐ NIST Type S T/C
- ☐ NIST Type T T/C
☐ DIN Type L T/C
☐ DIN Type U T/C
☐ W5Re/W26Re
☐ mV

4-20 mA Points
and Damping

4 mA Value

- ☐ **0 °C**
☐ _____ °C
☐ _____ °F
☐ _____ °R
☐ _____ K
☐ _____ mV
☐ _____ Ohms

20 mA Value

- ☐ **100 °C**
☐ _____ °C
☐ _____ °F
☐ _____ °R
☐ _____ K
☐ _____ mV
☐ _____ Ohms

Damping

- ☐ **5 Seconds**
☐ Other _____ (Value must be less than 32 sec.)

Tagging

Hardware Tag _____ (13 characters maximum)

Software Tag _____ (8 characters maximum - default is first 8 characters of the hardware tag)

Transmitter Information

Descriptor (C1 Option) ☐ _____ (16 characters maximum)

Message (C1 Option) ☐ _____ (32 characters max)

Date (C1 Option) ☐ Day ____ (numeric) ____ Month (alphabetic) ____ Year (numeric)

Software Detected Failure Mode and Software Security

Software Detected Failure Mode ☐ **High ★** ☐ Low

Software Security ☐ **Off ★** ☐ On

Signal Selection

☐ **4-20 mA with simultaneous digital signal based on HART protocol**

☐ Burst mode of HART digital process variable

Burst mode output options:

- ☐ Primary variable, percent of range
☐ All dynamic variables in engineering units
- ☐ Primary variable in percent of range and mA
☐ All dynamic variables in engineering units and the primary variable mA value

☐ Multidrop Communication Transmitter Address (1-15): ____ (default = 1)

Alarm and Saturation Values

☐ **Rosemount Standard**

☐ NAMUR-compliant. Available with option code A1 or CN.

☐ Custom

- ☐ High Alarm Level: _____ mA (must be between 21.0 and 23.0 mA)
☐ Low Alarm Level: _____ mA (must be between 3.5 and 3.75 mA)
☐ High Saturation Level: _____ mA (must be between 20.5 mA and the High Alarm Value minus 0.1 mA)
☐ Low Saturation Level: _____ mA (must be between the Low Alarm Value plus 0.1 mA and 3.9 mA)

= Standard configuration when no sensor is ordered in the model number

Product Data Sheet

00813-0100-4825, Rev GA
February 2008

Rosemount 248

Product Data Sheet

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February 2008

Rosemount 248

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