Rosemount 248 Temperature Transmitter

- *Basic temperature transmitter offers a reliable solution for temperature monitoring points*
- *Standard transmitter design provides flexible and reliable performance in process environments*
- *Experience lower over-all installation costs when compared to wiring sensor directly, reducing the need for expensive extension wires and multiplexers*
- *Explore the benefits of a Complete Point Solution from Rosemount Temperature*

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Contents

Rosemount 248 Temperature Transmitter

Basic temperature transmitter offers a cost effective solution for temperature monitoring points

- DIN B style head mount transmitter
- Variety of DIN B enclosure options
- Rail Mount
- HART / 4-20 mA protocol
- Single sensor capability with universal sensor inputs (RTD, T/C, mV, ohms)

Standard transmitter design provides flexible and reliable performance in process environments

- Offers improved measurement accuracy and reliability over direct-wiring a sensor to the digital control system for a lower overall installation cost
- One-year stability rating reduces maintenance costs
- Open/short sensor diagnostics assist with detecting issues in the sensor loop
- Compensation for ambient temperatures enhances transmitter performance

Explore the benefits of a Complete Point Solution from Rosemount Temperature Measurement

- An “Assemble To Sensor” option enables Emerson to provide a complete point temperature solution, delivering an installation-ready transmitter and sensor assembly
- Emerson offers a selection of RTDs, thermocouples, and thermowells that bring superior durability and Rosemount reliability to temperature sensing, complementing the Rosemount Transmitter portfolio

Experience global consistency and local support from numerous worldwide Rosemount Temperature manufacturing sites

- World-class manufacturing provides globally consistent product from every factory and the capacity to fulfill the needs of any project, large or small
- Experienced Instrumentation Consultants help select the right product for any temperature application and advise on best installation practices
- An extensive global network of Emerson service and support personnel can be on-site when and where they are needed

- Looking for a wireless temperature alternative? The Rosemount 248 Wireless temperature transmitter is a cost-effective solution that provides solid performance.
- For a versatile temperature transmitter that delivers proven field reliability and advanced accuracy, consider the Rosemount 644 temperature transmitter.

Rosemount 248 Temperature Transmitter

The Rosemount 248 temperature transmitter has a standard transmitter design that provides flexible and reliablie performance in process environments.

Transmitter features include:

- HART / 4-20 mA communication protocol
- DIN B style head mount and Rail Mount transmitter types
- Variety of DIN B enclosure options
- Sanitary Connection Heads available (Option Code F and S)
- 3-Point Calibration Certificate (Option Code Q4)
- Assemble to Sensor options (Option Code XA)

Table 1. 248 Head Mount Temperature Transmitter

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

Model	**Product Description**			
248	Temperature Transmitter			
Transmitter Type				
Standard				**Standard**
H	DIN B Head Mount			★
Transmitter Output				
Standard				**Standard**
A	4–20 mA with digital signal based on *HART* Protocol			★
Product Certifications		**Enclosure Option Codes Permitted**		
Standard				**Standard**
E5	FM Explosion-Proof	A, U, G, H		★
I5	FM Intrinsic Safety and Class I, Division 2	A, B, U, N, C, G, S, 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, C, G, H		★
K6	CSA Intrinsic Safety, Explosion-Proof, and Class I, Division 2	A, U, G, H		★
E1	ATEX Flameproof	A, U, G, H		★
I1	ATEX Intrinsic Safety	A, B, U, N,C, G, S, H		★
ND	ATEX Dust	A, U, G, H		★
N1	ATEX Type n	A, U, G, H		★
NC[(1)]	ATEX Type n Component	N		★
E7	IECEx Flameproof and Dust	A, U, G, H		★
I7	IECEx Intrinsic Safety	A, B, U, N, C, G, S, H		★
N7	IECEx Type n	A, U, G, H		★
NG	IECEx Type n Component	N		★
NA	No Approval	All Options		★
Enclosure		**Material**	**IP Rating**	
Standard				**Standard**
A	Connection Head	Aluminum	IP66/68	★
B	BUZ Head	Aluminum	IP65	★
C	BUZ Head	Polypropylene	IP65	★
G	Connection Head	SST	IP66/IP68	★
H	Universal Head (Junction Box)	SST	IP66/IP68	★
U	Universal Head (Junction Box)	Aluminum	IP66/IP68	★
N	No Enclosure			

Table 1. 248 Head Mount Temperature Transmitter

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

Expanded				
F	Sanitary Connection Head, DIN A	Polished SST	IP66/IP68	
S	Sanitary Connection Head, DIN B	Polished SST	IP66/IP68	
Conduit Entry Size(2)				
Standard				**Standard**
1(3)	M20 x 1.5 (CM20)			★
2	1/2-inch NPT			★
0	No Enclosure			★
Assemble To Options				
Standard				**Standard**
XA	Sensor Specified Separately and Assembled to Transmitter			★
NS	No Sensor			★

Options (Include with selected model number)

Alarm Level Configuration		
Standard		**Standard**
A1	NAMUR alarm and saturation levels, high alarm	★
CN	NAMUR alarm and saturation levels, low alarm	★
5-Point Calibration		
Standard		**Standard**
C4	5-Point Calibration (Requires the Q4 option code to generate a Calibration Certificate)	★
Calibration Certificate		
Standard		**Standard**
Q4	Calibration Certificate (3-Point Calibration)	★
External Ground		
Standard		**Standard**
G1	External Ground Lug Assembly	★
Line Filter		
Standard		**Standard**
F6	60 Hz Line Voltage Filter	★
Conduit Electrical Connector		
Standard		**Standard**
GE(4)(2)	M12, 4 pin, Male Connector (eurofast®)	★
GM(2)	A-size Mini, 4 pin, Male Connector (minifast®)	★
External Label		
Standard		**Standard**
EL	External Label for ATEX Intrinsic Safety	★
Cover Chain Option		
Standard		**Standard**
G3	Cover Chain	★
Software Configuration		
Standard		**Standard**
C1	Custom Configuration of Date, Descriptor and Message (Requires CDS with order)	★
Typical Model Number: 248H A I1 A 1 DR N080 T08 EL U250 CN		

(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) All process connection threads are 1/2 in. NPT, except for Enclosure Codes H and U with Conduit Entry Code 1 and Sensor Type Code NS

(3) For enclosures H and U with the XA option specified, a 1/2-in. NPT to M20 x 1.5 thread adapter is used.

(4) 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.

The Rosemount 248 temperature transmitter has a standard transmitter design that provides flexible and reliablie performance in process environments.

Transmitter features include:

- HART / 4-20 mA communication protocol
- Rail Mount transmitter type
- 3-Point Calibration Certificate (Option Code Q4)
- Custom Configuration of Software Parameters (Option Code C1)

Table 2. 248R Rail Mount Transmitter

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

Model	Product Description	
248R	Rail Mount Temperature Transmitter	
Output Protocol		
Standard		**Standard**
A	4-20 mA with digital signal based on HART protocol	★
Product Certifications		
Standard		**Standard**
I5	FM Intrinsically Safe and Class I, Division 2	★
I6	CSA Intrinsically Safe and Class I, Division 2	★
I1	ATEX Intrinsic Safety	★
NC	ATEX Type n Component	★
I7(1)	IECEx Intrinsic Safety	★
NA	No Approvals	★

Options (Include with selected model number)

Software Configuration		
Standard		**Standard**
C1	Custom Configuration of enters date, descriptor and message (CDS required with order)	★
Alarm Level Configuration		
Standard		**Standard**
A1	NAMUR alarm and saturation levels, high alarm	★
CN	NAMUR alarm and saturation levels, low alarm	★
5-Point Calibration		
Standard		**Standard**
C4	5-Point Calibration (Requires the Q4 option code to generate a Calibration Certificate)	★
Calibration Certificate		
Standard		**Standard**
Q4	Calibration Certificate (3-Point Calibration)	★
Line Filter		
Standard		**Standard**
F6	60 Hz Line Voltage Filter	★
Mounting Style		
Standard		**Standard**
GR	G-Rail Mounting	★
Typical Model Number: 248R A I1 Q4		

(1) Consult Factory for availability.

Transmitter Specifications

FUNCTIONAL SPECIFICATIONS

Inputs

User-selectable; sensor terminals rates to 42.4 Vdc. See "Transmitter Accuracy and Ambient Temperature Effects" on page 8 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 Field Communicator or control system interface.

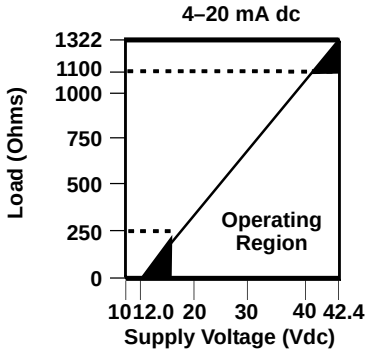
Isolation

Input/output isolation tested to 500 Vac rms (707 Vdc) 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 Vdc.

Maximum Load = 40.8 x (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 Field 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:

Figure 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

Field 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

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 14).

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 • 8 kV air discharge	None
Radiated	• 80 – 1000 MHz at 10 V/m AM	None
Burst	• 1 kV for I.O.	None
Surge	• 0.5 kV line–line • 1 kV line–ground (I.O. tool)	None
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 ±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

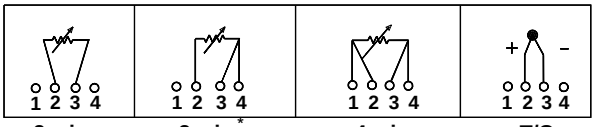
For RTD and thermocouple inputs the transmitter will have a stability of ±0.1% of reading or 0.1 °C (whichever is greater) for twelve months

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

248 Sensor Connections Diagram



2-wire RTD and Ω | **3-wire* RTD and Ω** | **4-wire RTD and Ω** | **T/C and mV**

* *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 3. 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] (α = 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] (α = 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 (α = 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 (α = 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 (α = 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 (α = 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 (α = 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 (α = 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 "Product Certifications" on page 9 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 CJC accuracy for thermocouple measurement: ±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) ASTME 988-96.

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

Transmitter Accuracy Example

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

- Temperature Effects: 0.006 °C x (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: $\sqrt{0.2^2 + 0.06^2} = 0.21°C$

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 4. Entity Parameters

Loop/Power	Sensor
U_i = 30 Vdc	U_o = 45 Vdc
I_i = 130 mA	I_o = 26 mA
P_i = 1.0 W	P_o = 290 mW
C_i = 3.6 nF	C_o = 0.4 nF
L_i = 13.8 µH	L_o = 49.2 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

(1) Consult factory for availability.

European Certifications

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

Temperature Codes:
T5 (–60 ≤ T_{amb} ≤ 80 °C)
T6 (–60 ≤ T_{amb} ≤ 60 °C)

Table 5. Entity Parameters

Loop/Power	Sensor
U_i = 30 Vdc	U_o = 45 Vdc
I_i = 130 mA	I_o = 26 mA
P_i = 1.0 W	P_o = 290 mW
C_i = 3.6 nF	C_i = 2.1 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.

E1 ATEX Flame-Proof
Certificate Number: KEMA99ATEX8715X
ATEX Marking: ⟨Ex⟩ II 2 G
CE 1180
Ex d IIC T6

Special Conditions for Safe Use (X):

For information on the dimensions of the flameproof joints the manufacturer should be contacted.

Table 6. Entity Parameters

Sensor	Transmitter
U_{max} = 5 V	U_{max} = 55 Vdc
I_{max} = 2.0 mA	I_{max} = 40 mA

Temperature Codes:
T6 (–40 ≤ T_{amb} ≤ 65 °C)

N1 ATEX Type n
Certificate Number: BAS00ATEX3145
ATEX Marking: ⟨Ex⟩ II 3
Ex nL IIC

Table 7. Input Parameters

Transmitter U_i = 45 V
Resistance Element Terminal Block U_i = 5 V
Thermocouple Terminal Block U_i = 0 V

Temperature Codes:
T5 (–40 ≤ T_{amb} ≤ 70 °C)

NC ATEX Type n Component
Certificate Number: Baseefa03ATEX0032U
ATEX Marking: ⟨Ex⟩ II 3G
Ex nA IIC

Table 8. Input Parameters

U_i = 42.4 V

Temperature Codes:
T5 (–60 ≤ T_{amb} ≤ 80 °C)
T6 (–60 ≤ T_{amb} ≤ 60 °C)

ND ATEX Dust
Certificate Number: KEMA99ATEX8715X
ATEX Marking: II 1 D
CE 1180
T95 C (-40 ≤ T_{amb} ≤ 85 °C)
Ex tD A20 IP66

Table 9. Input Parameters

Sensor	Transmitter
U_{max} = 5 V	U_{max} = 55 Vdc
I_{max} = 2.0 mA	I_{max} = 40 mA

Brazilian Certifications

Centro de Pesquisas de Energia Eletrica (CEPEL) Approval

I2 CEPEL Intrinsic Safety

IECEx Certifications

E7 IECEx Flameproof and Dust
Certificate Number: IECEx KEM 09.0015X
Ex d IIC T6 (Flameproof)
Ex tD A20 IP 66 T 95 °C (Dust)
Vmax = 42.4 V

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

Table 10. Electrical Data

Transmitter	Sensor
U_{max} = 42.4 Vdc	U_{max} = 5 V
I_{max} = 24.0 mA	I_{max} = 2.0 mA

NG IECEx Type n Component
Certificate number: IECEx BAS 08.0087U
Ex nA IIC T5 (-60 °C ≤ T_{amb} ≤ 80 °C)
Ex nA IIC T6 (-60 °C ≤ T_{amb} ≤ 60 °C)
Input Parameter: Ui = 42.4 Vdc

Schedule of Limitations:
The component must be housed in a suitably certified enclosure that provides a degree of protection of at least IP54.

I7 IECEx Intrinsic Safety
Certificate Number: IECEx BAS 07.0086X
Ex ia IIC T5 (-60 °C ≤ T_{amb} ≤ 80 °C)
Ex ia IIC T6 (-60 °C ≤ T_{amb} ≤ 60 °C)

Special Conditions for Safe Use (X):

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

Table 11. Entity Parameters

Transmitter	Sensor
U_i = 30 Vdc	U_o = 45 Vdc
I_i = 130 mA	I_o = 26 mA
P_i = 1.0 W	P_o = 290 mW
C_i = 3.63 nF	C_i = 2.1 nF
L_i = 0 mH	L_i = 0 mH

N7 IECEx Type n
Certificate Number: IECEx BAS 07.0055
Ex nA nL IIC T5 (-40 °C ≤ T_{amb} ≤ 70 °C)

Table 12. Electrical Data

Transmitter	Sensor	
	RTD	Thermocouple
U_i = 45 V	U_i = 5 V	U_i = 0

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

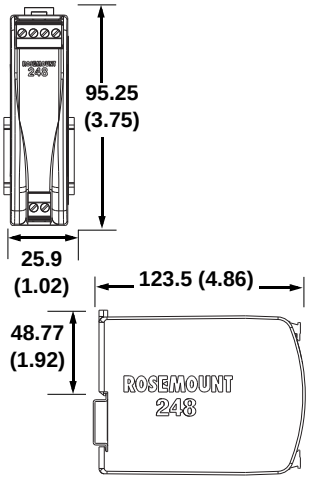
See Certificate

Ukraine GOST

See Certificate

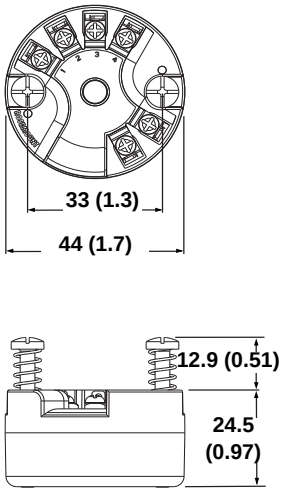
Dimensional Drawings

248R Railmount Transmitter



248H Headmount Transmitter

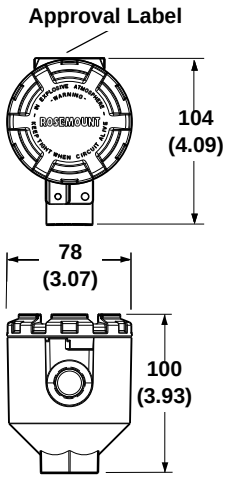
(enlarged)



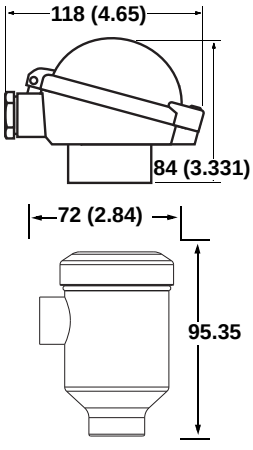
Dimensions are in millimeters (inches)

Enclosures

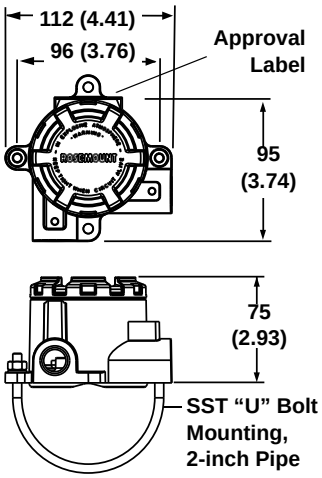
Connection Head[1]



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



Universal Head[2] (option codes H and U)

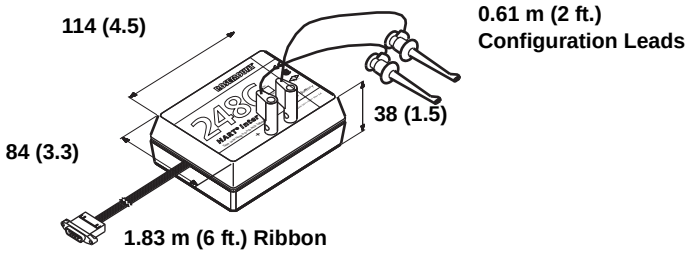


(1) If ordering the transmitter with a DIN style sensor, it is recommended that the enclosure be ordered within the sensor model (Product Data Sheet doc # 00813-0200-2654) rather than within the transmitter model, in order to drive necessary parts.

(2) 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.

248C Configuration Interface

Option 1: HART Interface Box



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.*

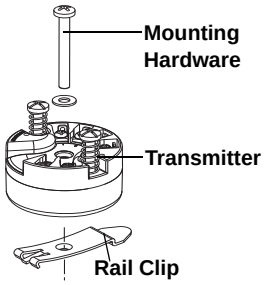
Table 13. 248C Configuration Interface

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
The Expanded offering is subject to additional delivery lead time.

Model	Product Description	
248C(1)	PC-based 248 HART Configuration Software	
Communications Hardware Options		
Standard		**Standard**
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 14. 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 (α=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 6
CN: NAMUR-Compliant, Low Alarm	See Table 1 on page 6
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

Product Data Sheet
00813-0100-4825, Rev JA
November 2010

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