

# Rosemount™ 848T High Density Temperature Measurement Family



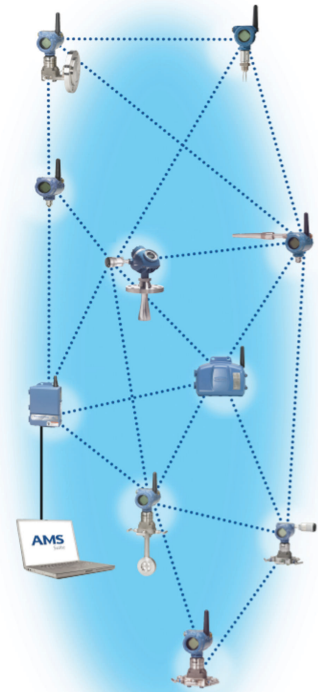
- Innovative temperature measurement for high density applications that provide installation and operational savings.
- Independently configurable inputs that support RTD, thermocouple, ohm, mV, 0–10 volt, and 4–20 mA signals.
- Enclosure options and intrinsically safe design allows for installation close to any process, including hazardous areas.
- *WirelessHART*® capabilities extends the full benefits of Plantweb™ to previously inaccessible locations.
- Industry first measurement validation diagnostic can identify a variety of process concerns including sensor degradation, sensor wiring connectivity, high vibration (affecting the measurement), and abnormal process variations.

# High density temperature measurement

## Wireless delivers innovative wireless solutions for temperature

- Self-organizing network delivers information rich data with greater than 99 percent data reliability and establishes a highly stable network.
- IEC-approved *WirelessHART* protocol.
- Emerson SmartPower™ Solutions provide an intrinsically safe power module, allowing field replacements without removing the transmitter from the process, keeping personnel safe and reducing maintenance costs.
- Emerson’s layered approach to wireless network security ensures data transmissions are secure.

**WirelessHART**



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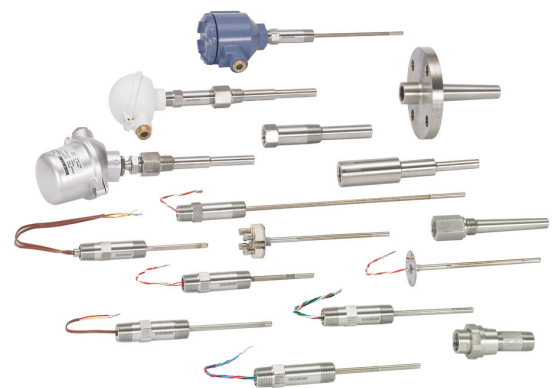
## FOUNDATION™ Fieldbus provides effective measurements with reduced wiring costs

- Internationally recognized digital network (IEC 61158) supports the connection of up to 16 devices on a single twisted wire pair.
- Allows advanced computations through use of function blocks.
- Provides continuous measurement status for each measurement point.
- Lower costs by reducing wiring, terminations, and required number of I.S. Barriers.



## Explore the benefits of Complete Point Solution™ from Rosemount Temperature Measurement

- Emerson offers a selection of RTDs and thermocouples that bring superior durability and Rosemount reliability to temperature sensing.
- A broad thermowell offering meets the demanding requirements of a variety of process applications.



## Experience global consistency and local support from worldwide Rosemount Temperature manufacturing site

- World-class manufacturing provides globally consistent product from every factory and the capacity to fulfill the needs of any project.
- Experienced instrumentation consultants help select the right products for each temperature application.
- An extensive global network of Emerson service and support personnel can be onsite when and where they are needed.



## Increase performance with High Density transmitters

- Transmit multiple measurements with one set of electronics.
- Mount close to process to reduce sensor wire length and increase measurement reliability.
- Enhance accuracy with EMI correction, cold junction compensation, and device diagnostics.
- Reduce installation costs by as much as 70 percent.



## Avoid unnecessary process shutdowns, on-scale failure related issues, and unsafe process conditions with measurement validation diagnostic

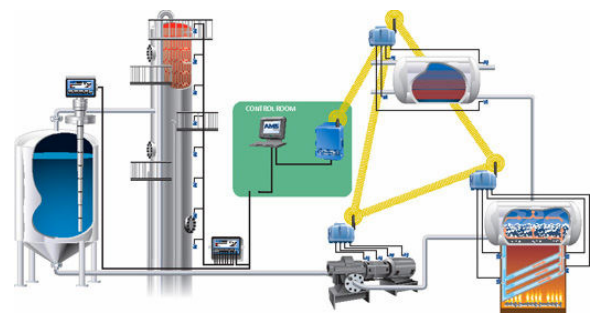
- Detect measurement abnormalities and take preventive action before shutdown is necessary.
- Determine validity of data points that are outside of alarm limits.
- Identify on-scale failures and take action before process efficiency and safety is compromised.
- Detect abnormally fast process rates of change before alarm state is reached.



## High density temperature measurement

Ideal solution for taking multiple measurements in close proximity to each other such as:

- Bearing temperature on pumps and motors
- Distillation columns
- Furnaces and boilers
- Reactors, storage tanks, and many more

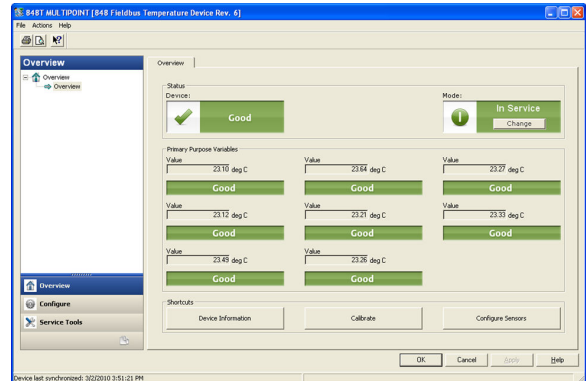


## Simplify installation and reduce wiring costs

- Eliminate marshalling
- Less wire routing and fewer terminations
- Faster startups with fewer devices

## Access powerful information with new device dashboards

- Leverage Human Centered Design practices to create an intuitive user interface
- Instantly see status and output of each sensor
- Direct links to graphical diagnostics and troubleshooting help
- Drastically lower configuration time



## Access information when you need it with asset tags

Newly shipped devices include a unique QR code asset tag that enables you to access serialized information directly from the device. With this capability, you can:

- Access device drawings, diagrams, technical documentation, and troubleshooting information in your MyEmerson account
- Improve mean time to repair and maintain efficiency
- Ensure confidence that you have located the correct device
- Eliminate the time-consuming process of locating and transcribing nameplates to view asset information

# Rosemount 848T FOUNDATION™ Fieldbus Temperature Transmitter



The Rosemount 848T offers a low cost solution for high density measurements. The transmitter accepts eight independently configurable sensor inputs, and can be mounted close to the process to improve data quality. FOUNDATION Fieldbus architecture allows up to 128 temperature measurements to be transmitted on a single H1 Fieldbus line. Additionally, the transmitter is bus-powered, further reducing the amount of required wiring to install the device. The robust design has proven itself in thousands of successful installations. Capabilities include:

- Eight independently configurable inputs, including 2- and 3-wire RTDs, thermocouples, mV, 2- and 3-wire ohms, and 4–20 mA signals
- Industry first measurement validation diagnostic
- Fieldbus functionality with eight AI blocks, two MAI blocks, four ISEL Blocks, and backup LAS capabilities
- 600 Vdc isolation and integral transient protection

CONFIGURE >
VIEW PRODUCT >

## Online product configurator

Many products are configurable online using our Product Configurator. Select the **Configure** button or visit our [website](#) to start. With this tool's built-in logic and continuous validation, you can configure your products more quickly and accurately.

## Model codes

Model codes contain the details related to each product. Exact model codes will vary; an example of a typical model code is shown in the following figure.

Figure 1: Model Code Example

<b>3144P D1 A 1 NA</b>	<b>M5 DA1 Q4</b>
1	2

1. Required model components (choices available on most)
2. Additional options (variety of features and functions that may be added to products)

## Specifications and options

See the Specifications and options section for more details on each configuration. Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See the Material selection section for more information.

## Optimizing lead time

The starred offerings (★) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

## Required model components

### Model

Code	Description	
848T	High Density Temperature Measurement Family	★

### Transmitter output

Code	Description	
F	FOUNDATION™ Fieldbus digital signal (includes AI, MAI, and ISEL function blocks, and Backup Link Active Scheduler)	★

### Product certification

Consult factory for availability.

Code	Description	Rosemount junction box required?	
I1	ATEX Intrinsic Safety	No	★
I2	INMETRO Intrinsic Safety	No	★
I3	NEPSI Intrinsic Safety	No	★
I4	TIIS Intrinsically Safety (FISCO) Type 'ia'	No	
H4	TIIS Intrinsic Safety (FISCO) Type 'ib'	No	
I5 <sup>(1)</sup>	FM Intrinsically Safe	No	★
I6 <sup>(1)</sup>	CSA Intrinsically Safe	No	★
I7	IECEx Intrinsic Safety	No	★
IA	ATEX FISCO Intrinsic Safety	No	★
IB	INMETRO FISCO Intrinsic Safety	No	★
IE	FM FISCO Intrinsically Safe	No	★
IF <sup>(1)</sup>	CSA FISCO Intrinsically Safe, Division 2	No	★
IG	IECEx FISCO (Intrinsic Safety)	No	★
IM	Technical Regulations Customs Union (EAC) Intrinsic Safety	No	★
KG	FM, CSA, ATEX, and IECEx Intrinsic Safety	No	★
N1	ATEX Type n (enclosure required)	Yes	★
N3	China Type n (enclosure required)	Yes	★
N5	FM Class I, Division 2, and Dust Ignition proof (enclosure required)	Yes	★

Code	Description	Rosemount junction box required?	
N6	CSA Class I, Division 2	No	★
N7	IECEX Type n (enclosure required)	Yes	★
NC	ATEX Type n Component (Ex nA nL)	No <sup>(2)</sup> (3)	★
ND	ATEX Dust (enclosure required)	Yes	★
NJ	IECEX Type n Component (Ex nA nL)	No <sup>(2)</sup>	★
NK	FM Class I, Division 2	Yes	★
IM	Technical Regulations Customs Union (EAC) Intrinsic Safety	No	★
IP	Korea Intrinsic Safety	No	★
NA	No approval	No	★

(1) Available only with S001 option.

(2) The Rosemount 848T ordered with component approval is not approved as a stand-alone unit. Additional system certification is required.

### Input types

Code	Description	
S001	RTD, thermocouple, mV, Ohm inputs	★
S002 <sup>(1)</sup>	RTDs, thermocouple, mV, Ohm and 4–20 mA inputs	★

(1) S002 is only available with Product Certification N5, N6, N1, NC, NK, and NA.

## Additional options

### Plantweb™ advanced diagnostics

Code	Description	
D04	Measurement validation diagnostic	★

### Transient protection

Code	Description	
T1	Integral transient protector	★

### Mounting bracket

Code	Description	
B6	Mounting bracket for 2 in (51 mm) pipe mounting – SST bracket and bolts	★

### Enclosure options

Code	Description	
JA1	Aluminum junction box; no entries	★



Code	Description	
JA2	Aluminum cable glands (9 × M20 nickel-plated brass glands for 7.5–11.9 mm unarmored cable)	★
JA3	Aluminum conduit entries (five plugged holes, suitable for installing ½-in. NPT fittings)	★
JA4	Aluminum with cable glands (9 × ½-in. NPT for 7.5 to 11.9 mm)	★
JA5	Aluminum with conduit entries (nine plugged holes, suitable for installing ½-in. NPT fittings)	★
JS1	Stainless steel junction box; no entries	★
JS2	Stainless steel box, cable glands (9 × M20 nickel-plated brass glands for 7.5–11.9 mm unarmored cable)	★
JS3	Stainless steel box, conduit entries (five plugged holes, suitable for installing ½-in. NPT fittings)	★

### Software configuration

Code	Description	
C1	Custom configuration of date, descriptor, message, and wireless parameters (requires CDS with order)	★

### Line filter

Code	Description	
F5	50 Hz line voltage filter	★
F6	60 Hz line voltage filter	★

### Calibration certificate

Code	Description	
Q4	Calibration certificate (3-point calibration)	★

### Special temperature test

Code	Description	
LT	Test to -60 °F (-51 °C)	★

### Conduit electrical connector

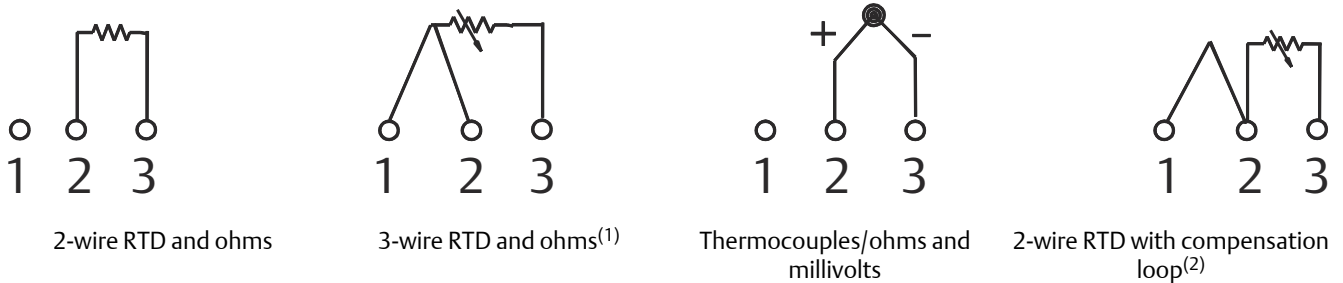
Code	Description	
GE	M12, 4-pin, male connector (eurofast®)	★
GM	A size mini, 4-pin, male connector (minifast®)	★

### Extended product warranty

Code	Description	
WR3	3-year limited warranty	★
WR5	5-year limited warranty	★

## Wiring

Figure 2: Rosemount 848T Sensor Wiring Diagram



- (1) Emerson provides 4-wire sensors for all single-element RTDs. Use these RTDs in 3-wire configurations by clipping the fourth lead or leaving it disconnected and insulated with electrical tape.
- (2) The transmitter must be configured for a 3-wire RTD in order to recognize an RTD with a compensation loop.

## Standard configuration

Unless otherwise specified, the transmitter will be shipped as follows for all eight sensors:

Standard configuration settings	
Sensor type <sup>(1)</sup>	Thermocouple Type J
Damping <sup>(1)</sup>	Five seconds
Measurement units <sup>(1)</sup>	°C
Output <sup>(1)</sup>	Linear with temperature
Line voltage filter <sup>(1)</sup>	60 Hz
Temperature specific blocks	Sensor transducer block (1)
FOUNDATION™ Fieldbus function blocks	Analog input (8) Multiple analog input (2) Input selector (4)
Input transient filter	Enabled

(1) For all eight sensors.

# Specifications for Rosemount 848T FOUNDATION™ Fieldbus

## Functional specifications

### Inputs

Inputs include:

- Eight independently configurable channels including combinations of 2- and 3-wire RTDs, thermocouples, mV, 2- and 3-wire and ohm inputs
- 4–20 mA inputs using optional connector(s)

### Outputs

Outputs consist of Manchester-encoded digital signal that conforms to IEC 61158 and ISA 50.02.

### Status

- 600 Vdc channel to channel isolation<sup>(1)</sup>
- 10 Vdc channel to channel isolation for all operating conditions with maximum 500 ft (152 m) of sensor lead length 18 AWG (0.823 mm<sup>2</sup>).

### Ambient temperature limits

-40 °F (-40 °C) to 185 °F (85 °C)

### Accuracy

(Pt 100 at reference condition: 20 °C)  $\pm 0.30$  °C ( $\pm 0.54$  °F)

### Related information

[Accuracy — input options](#)

### Isolation

- 600 Vdc channel to channel isolation<sup>(2)</sup>.
- 10 Vdc channel to channel isolation for all operating conditions with maximum 500 ft (152 m) of sensor lead length 18 AWG (0.823 mm<sup>2</sup>).

### Power supply

Powered over FOUNDATION Fieldbus with standard fieldbus power supplies. The transmitter operates between 9.0 and 32.0 Vdc, 22 mA maximum. (transmitter power terminals are rated to 42.4 Vdc.)

### Transient protection

The transient protector (option code T1) helps to prevent damage to the transmitter from transients induced on the loop wiring by lightning, welding, heavy electrical equipment, or switch gears. This option is installed at the factory for the Rosemount 848T and is not intended for field installation.

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(1) Reference conditions are -40 °F (-40 °C) to 140 °F (60 °C) with 100 ft (30 m) of sensor lead length 18 AWG (0.823 mm<sup>2</sup>) wire.

(2) Reference conditions are -40 °F (-40.0 °C) to 140 °F (60 °C) with 100 ft (30 m) of sensor lead length 18 AWG (0.823 mm<sup>2</sup>) wire.

### Update time

Approximately 1.5 seconds to read all eight inputs

### Humidity limits

0–99 percent non-condensing relative humidity

### Turn-on time

Performance within specifications is achieved in less than 30 seconds after power is applied to the transmitter.

### Alarms

The AI and ISEL function blocks allow the user to configure the alarms to HI-HI, HI, LO, or LO-LO with a variety of priority levels and hysteresis settings.

### Electromagnetic compatibility (EMC)

Meets all industrial environment requirements of EN61326 and NAMUR NE-21. Maximum deviation < 1 percent span during EMC disturbance.

### Stability

- ±0.1 percent of reading or 0.18 °F (0.1 °C), whichever is greater, for two years for RTDs.
- ±0.1 percent of reading or 0.18 °F (0.1 °C), whichever is greater, for one year for thermocouples.

### Self calibration

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

### Vibration effect

Tested to the following with no effect on performance per IEC 60770-1, 1999.

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

### Backup Link Active Scheduler (LAS)

The transmitter is classified as a device link master, which means it can function as a LAS if the current link master device fails or is removed from the segment.

The host or other configuration tool is used to download the schedule for the application to the link master device. In the absence of a primary link master, the transmitter will claim the LAS and provide permanent control for the H1 segment.

### Software upgrade in the field

Software for the Rosemount 848T with FOUNDATION Fieldbus is easy to upgrade in the field using the FOUNDATION Fieldbus Common Device Software Download procedure.

## FOUNDATION Fieldbus parameters

Schedule Entries	20
Links	30
Virtual Communications Relationships (VCR)	20

## Physical specifications

### Conformance to specifications ( $\pm 3\sigma$ [Sigma])

Technology leadership, advanced manufacturing techniques, and statistical process control ensure specification conformance to at least  $\pm 3\sigma$ .

### Mounting

The transmitter can be mounted directly onto a DIN rail or it can be ordered with an optional junction box. When using the optional junction box, the transmitter can be mounted onto a panel or a 2 in (51 mm) pipe stand (with option code B6).

### Entries for optional junction box

<b>No entry</b>	Used for custom fittings.
<b>Cable gland for aluminum junction box (JA4)</b>	9 x ½-in. NPT nickel-plated brass glands for 7.5–11.9 mm unarmored cable
<b>Cable gland for stainless steel junction box (JS2)</b>	9 x M20 nickel-plated brass glands for 7.5–11.9 mm unarmored cable
<b>Conduit</b>	Five plugged 0.86-in. diameter holes suitable for installing ½-in. NPT fittings.

### Materials of construction for optional junction box

Junction box type	Paint
Aluminum	Epoxy resin
Stainless steel	N/A

### Weight

Assembly	Weight		
	oz	lb	kg
Rosemount 848T only	7.5	.47	.208
Rosemount 848T aluminum <sup>(1)</sup>	76	4.75	2.2
Stainless steel <sup>(1)</sup>	77.0	4.81	2.18

(1) Add 35.2 oz (2.2 lb, 0.998 kg) for nickel-plated brass glands.

### Environmental ratings

Type 4X and IP66 with optional junction box.

## Function blocks

### Analog Input (AI)

- Processes the measurement and makes it available on the fieldbus segment.
- Allows filtering, alarming, and engineering unit changes.

### Input Selector (ISEL)

- Used to select between inputs and generate an output using specific selection strategies such as minimum, maximum, midpoint, or average temperature.
- Since the temperature value always contains the measurement status, this block allows the selection to be restricted to the first “good” measurement.

### Multiple Analog Input Block (MAI)

- The MAI block allows the eight AI blocks to be multiplexed together so they serve as one function block on the H1 segment, resulting in greater network efficiency.

## Accuracy – input options

Table 1: 2- and 3-wire RTDs

Sensor option	Sensor reference	Input ranges		Accuracy over range(s)	
		°C	°F	°C	°F
Pt 50 ( $\alpha = 0.00391$ )	GOST 6651-94	-200 to 550	-328 to 1022	$\pm 0.57$	$\pm 1.03$
Pt 100 ( $\alpha = 0.00391$ )	GOST 6651-94	-200 to 550	-328 to 1022	$\pm 0.28$	$\pm 0.50$
Pt 100 ( $\alpha = 0.00385$ )	IEC 751; $\alpha = 0.00385$ , 1995	-200 to 850	-328 to 1562	$\pm 0.30$	$\pm 0.54$
Pt 100 ( $\alpha = 0.003916$ )	JIS 1604, 1981	-200 to 645	-328 to 1193	$\pm 0.30$	$\pm 0.54$
Pt 200 ( $\alpha = 0.00385$ )	IEC 751; $\alpha = 0.00385$ , 1995	-200 to 850	-328 to 1562	$\pm 0.54$	$\pm 0.98$
Pt 200 ( $\alpha = 0.003916$ )	JIS 1604; $\alpha = 0.003916$ , 1981	-200 to 645	-328 to 1193	$\pm 0.54$	$\pm 0.98$
Pt 500	IEC 751; $\alpha = 0.00385$ , 1995	-200 to 850	-328 to 1562	$\pm 0.38$	$\pm 0.68$
Pt 1000	IEC 751; $\alpha = 0.00385$ , 1995	-200 to 300	-328 to 572	$\pm 0.40$	$\pm 0.72$
Ni 120	Edison curve no. 7	-70 to 300	-94 to 572	$\pm 0.30$	$\pm 0.54$
Cu 10	Edison curve no. 7	-50 to 250	-58 to 482	$\pm 3.20$	$\pm 5.76$
Cu 100 ( $a=428$ )	GOST 6651-94	-185 to 200	-301 to 392	$\pm 0.48$	$\pm 0.86$
Cu 50 ( $a=428$ )	GOST 6651-94	-185 to 200	-301 to 392	$\pm 0.96$	$\pm 1.73$
Cu 100 ( $a=426$ )	GOST 6651-94	-50 to 200	-58 to 392	$\pm 0.48$	$\pm 0.86$
Cu 50 ( $a=426$ )	GOST 6651-94	-50 to 200	-58 to 392	$\pm 0.96$	$\pm 1.73$

**Table 2: Thermocouples—cold junction adds + 0.5 °C to listed accuracy**

Sensor option	Sensor reference	Input ranges		Accuracy over range(s)	
		°C	°F	°C	°F
NIST Type B (Accuracy varies according to input range)	NIST Monograph 175	100 to 300 301 to 1820	212 to 572 573 to 3308	± 6.00 ± 1.54	± 10.80 ± 2.78
NIST Type E	NIST Monograph 175	-200 to 1000	-328 to 1832	± 0.40	± 0.72
NIST Type J	NIST Monograph 175	-180 to 760	-292 to 1400	± 0.70	± 1.26
NIST Type K	NIST Monograph 175	-180 to 1372	-292 to 2501	± 1.00	± 1.80
NIST Type N	NIST Monograph 175	-200 to 1300	-328 to 2372	± 1.00	± 1.80
NIST Type R	NIST Monograph 175	0 to 1768	32 to 3214	± 1.50	± 2.70
NIST Type S	NIST Monograph 175	0 to 1768	32 to 3214	± 1.40	± 2.52
NIST Type T	NIST Monograph 175	-200 to 400	-328 to 752	± 0.70	± 1.26
DIN L	DIN 43710	-200 to 900	-328 to 1652	± 0.70	± 1.26
DIN U	DIN 43710	-200 to 600	-328 to 1112	± 0.70	± 1.26
w5Re26/W26Re	ASTME 988-96	0 to 2000	32 to 3632	± 1.60	± 2.88
Type L	GOST R 8.585-2001	-200 to 800	-328 to 1472	± 0.71	± 1.28
Terminal temperature		-50 to 85	-58 to 185	±0.50	±0.90
Millivolt input—Not approved for use with CSA Option Code I6		-10 to 100 mV		± 0.05 mV	
2- and 3-wire Ohm input		0 to 2000 ohms		± 0.90 ohm	
4–20 mA (Rosemount) <sup>(1)</sup>		4–20 mA		± 0.01 mA	
4–20 mA (NAMUR) <sup>(1)</sup>		4–20 mA		± 0.01 mA	

(1) Requires the S002 option code.

## Related information

### [Accuracy](#)

## Differential configuration notes

Differential capability exists between any two sensor types.

For all differential configurations, the input range is X to Y where

X = Sensor A minimum - Sensor B max.

Y = Sensor A maximum - Sensor B min.

## Accuracy for differential configurations

If sensor types are similar (for example, both RTDs or both thermocouples), the accuracy = 1.5 times worst case accuracy of either sensor type. If sensor types are dissimilar (for example, one RTD and one thermocouple), the accuracy = Sensor 1 Accuracy + Sensor 2 Accuracy.

## Analog sensors 4-20 mA

Two types of alarm levels are available with 4–20 mA sensors on the Rosemount 848T. These types must be ordered with the S002 option code complete with an analog connector kit. The alarm levels, accuracy for each type are listed in the following table.

**Table 3: Analog sensors**

Sensor option	Alarm levels	Accuracy
4–20 mA (Rosemount standard)	3.9 to 20.8 mA	± 0.01 mA
4–20 mA (NAMUR)	3.8 to 20.5 mA	± 0.01 mA

## Ambient temperature effect

Transmitters may be installed in locations where the ambient temperature is between -40 °F (-40 °C) and 185 °F (85 °C).

**Table 4: RTD**

NIST type	Accuracy per 1.0 °C (1.8 °F) change in ambient temperature <sup>(1)(2)</sup>	Temperature range (°C)
Pt 50 (α = 0.00391)	0.004 °C (0.0072 °F)	N/A
Pt 100 (α = 0.00391)	0.002 °C (0.0036 °F)	N/A
Pt 100 (α = 0.00385)	0.003 °C (0.0054 °F)	N/A
Pt 100 (α = 0.003916)	0.003 °C (0.0054 °F)	N/A
Pt 200 (α = 0.003916)	0.004 °C (0.0072 °F)	N/A
Pt 200 (α = 0.00385)	0.004 °C (0.0072 °F)	N/A
Pt 500	0.003 °C (0.0054 °F)	N/A
Pt 1000	0.003 °C (0.0054 °F)	N/A
Cu 10	0.03 °C (0.054 °F)	N/A
Cu 100 (a = 428)	0.002 °C (0.0036 °F)	N/A
Cu 50 (a = 428)	0.004 °C (.0072 °F)	N/A
Cu 100 (a = 426)	0.002 °C (0.0036 °F)	N/A
Cu 50 (a = 426)	0.004 °C (.0072 °F)	N/A
Ni 120	0.003 °C (0.0054 °F)	N/A

(1) Change in ambient is in reference to the calibration temperature of the transmitter 6868 °F (20 °C) typical from the factory).

(2) Ambient temperature effect specification valid over minimum temperature span of 28 °C (50 °F).

**Table 5: Thermocouple (R = the value of the reading)**

NIST type	Accuracy per 1.0 °C (1.8 °F) change in ambient temperature <sup>(1)(2)</sup>	Temperature range (°C)
Type B	0.014 °C 0.032 °C - (0.0025% of [R - 300]) 0.054 °C - (0.011% of [R - 100])	R ≥ 1000 300 ≤ R < 1000 100 ≤ R < 300
Type E	0.005 °C + (0.00043% of R)	All
Type J, DIN Type L	0.0054 °C + (0.00029% of R) 0.0054 °C + (0.0025% of  R )	R ≥ 0 R < 0



**Table 5: Thermocouple (R = the value of the reading) (continued)**

NIST type	Accuracy per 1.0 °C (1.8 °F) change in ambient temperature <sup>(1)(2)</sup>	Temperature range (°C)
Type K	0.0061 °C + (0.00054% of R) 0.0061 °C + (0.0025% of  R )	R ≥ 0 R < 0
Type N	0.0068 °C + (0.00036% of R)	All
Type R, Type S	0.016 °C 0.023 °C - (0.0036% of R)	R ≥ 200 R < 200
Type T, DIN Type U	0.0064 °C 0.0064 °C - (0.0043% of  R )	R ≥ 0 R < 0
GOST Type L	0.007 °C 0.007 °C + (0.003% of IRI)	R ≥ 0 R < 0
Type w5Re26	0.016 °C 0.023 °C - (0.0036% of R)	R > (less than or equal to) 200 R < 200
Millivolt	0.0005 mV	N/A
2- and 3-wire Ohm	0.0084 ohms	N/A
4–20 mA (Rosemount)	0.0001 mA	N/A
4-20 mA (NAMUR)	0.0001 mA	N/A

(1) Change in ambient is in reference to the calibration temperature of the transmitter 6868 °F (20 °C) typical from the factory).

(2) Ambient temperature effect specification valid over minimum temperature span of 28 °C (50 °F).

## Ambient temperature notes

### Examples

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

- Ambient temperature effects:  $0.003\text{ °C} \times (30 - 20) = 0.03\text{ °C}$
- Worst case error: Sensor accuracy + Ambient temperature effects =  $0.30\text{ °C} + 0.03\text{ °C} = 0.33\text{ °C}$
- Total probable error:

$$\sqrt{0.30^2 + 0.03^2} - 0.30\text{ °C}$$

## Product certifications

Rev 3.13

### European Directive Information

A copy of the EC Declaration of Conformity can be found at the end of the Quick Start Guide. The most recent revision of the EC Declaration of Conformity can be found at [Emerson.com/Rosemount](http://Emerson.com/Rosemount).

## 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 FM Approvals, a nationally recognized test laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

## 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.

## USA

### IS USA Intrinsically Safe and Nonincendive

**Certificate** 3011568

**Standards** FM Class 3600:1998, FM Class 3610:2010, FM Class 3611:2004, FM Class 3810:2005, ANSI/ISA 60079-0:2009, ANSI/ISA 60079-11:2009, NEMA 250:1991, IEC 60529:2011

**Markings** IS CL I, DIV 1, GP A, B, C, D; T4( $-50\text{ °C} \leq T_a \leq +60\text{ °C}$ ); NI CL I, DIV 2, GP A, B, C, D; T4A( $-50\text{ °C} \leq T_a \leq +85\text{ °C}$ ); T5( $-50\text{ °C} \leq T_a \leq +70\text{ °C}$ ) when installed per Rosemount drawing 00848-4404.

#### Note

Transmitters marked with Nonincendive CL I, DV 2 can be installed in Division 2 locations using general Division 2 wiring methods or Nonincendive Field Wiring (NIFW). See Drawing 00848-4404.

### IE USA FISCO

**Certificate** 3011568

**Standards** FM Class 3600:1998, FM Class 3610:2010, FM Class 3611:2004, FM Class 3810:2005, ANSI/ISA 60079-0:2009, ANSI/ISA 60079-11:2009, NEMA 250:1991, IEC 60529:2011

**Markings** IS CL I, DIV 1, GP A, B, C, D; T4( $-50\text{ °C} \leq T_a \leq +60\text{ °C}$ ); NI CL I, DIV 2, GP A, B, C, D; T4A( $-50\text{ °C} \leq T_a \leq +85\text{ °C}$ ); T5( $-50\text{ °C} \leq T_a \leq +70\text{ °C}$ ) when installed per Rosemount drawing 00848-4404.

### N5 USA Nonincendive and Dust-Ignitionproof

**Certificate** 3011568

**Standards** FM Class 3600:1998, FM Class 3611:2004, FM Class 3810:2005, ANSI/ISA 60079-0:2009, NEMA 250:1991, IEC 60529:2011

**Markings** NI CL I, DIV 2, GP A, B, C, D; DIP CL II/III, DIV 1, GP E, F, G; T4A( $-50\text{ °C} \leq T_a \leq +85\text{ °C}$ ); T5( $-50\text{ °C} \leq T_a \leq +70\text{ °C}$ ) when installed per Rosemount drawing 00848-4404; Type 4X

### NK USA Nonincendive

**Certificate** 3011568

**Standards** FM Class 3600:1998, FM Class 3611:2004, FM Class 3810:2005, ANSI/ISA 60079-0:2009, NEMA 250:1991, IEC 60529:2001

**Markings** NI CL I, DIV 2, GP A, B, C, D; T4A( $-50\text{ °C} \leq T_a \leq +85\text{ °C}$ ); T5( $-50\text{ °C} \leq T_a \leq +70\text{ °C}$ ) when installed per Rosemount drawing 00848-4404

**Note**

Only the N5 and NK are valid with the S002 option.

**Table 6: MAI Block Parameters**

Fieldbus (input)	FISCO (input)	Nonincendive (input)	Sensor field terminal (output)
$V_{MAX} = 30\text{ V}$	$V_{MAX} = 17.5$	$V_{MAX} = 42.4$	$V_{OC} = 12.5\text{ V}$
$I_{MAX} = 300\text{ mA}$	$I_{MAX} = 380\text{ mA}$	$C_i = 2.1\text{ nF}$	$I_{SC} = 4.8\text{ mA}$
$P_i = 1.3\text{ W}$	$P_i = 5.32\text{ W}$	$L_i = 0$	$P_O = 15\text{ mW}$
$C_i = 2.1\text{ nF}$	$C_i = 2.1\text{ nF}$	N/A	$C_A = 1.2\text{ }\mu\text{F}$
$L_i = 0$	$L_i = 0$	N/A	$L_A = 1\text{ H}$

## Canada

### E6 Canada Explosionproof, Dust-Ignitionproof, Division 2 (JX3 Enclosure Required)

**Certificate** 1261865

**Standards** CAN/CSA C22.2 No. 0-M91 (R2001), 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, CSA Std. C22.2 No. 213-M1987, CSA Std. C22.2 No. 60529:05

**Markings** Explosionproof for Class I, Division 1, Groups B, C, and D; T4( $-40\text{ °C} \leq T_a \leq +40\text{ °C}$ ) when installed per Rosemount drawing 00848-1041; Dust-Ignitionproof for Class II, Division 1, Groups E, F, and G; Class III; Class I, Division 2, Groups A, B, C, and D; T3C( $-50\text{ °C} \leq T_a \leq +60\text{ °C}$ ) when installed per Rosemount drawing 00848-4405; Conduit Seal Required

### I6 Canada Intrinsically Safe and Division 2

**Certificate** 1261865

**Standards** CAN/CSA C22.2 No. 0-M91 (R2001), CAN/CSA C22.2 No. 94-M91, CSA Std. C22.2 No. 142-M1987, CSA Std. C22.2 No. 157-92, CSA Std. C22.2 No. 213-M1987, CSA Std. C22.2 No. 60529:05

**Markings** Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D; T3C( $-50\text{ °C} \leq T_a \leq +60\text{ °C}$ ) when installed per Rosemount drawing 00848-4405; Class I, Division 2, Groups A, B, C, D; T3C( $-50\text{ °C} \leq T_a \leq +60\text{ °C}$ ) when installed per Rosemount drawing 00848-4405

### IF Canada FISCO

**Certificate** 1261865

**Standards** CAN/CSA C22.2 No. 0-M91 (R2001), CAN/CSA C22.2 No. 94-M91, CSA Std. C22.2 No. 142-M1987, CSA Std. C22.2 No. 157-92, CSA Std. C22.2 No. 213-M1987, CSA Std. C22.2 No. 60529:05

**Markings** Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D; T3C( $-50\text{ °C} \leq T_a \leq +60\text{ °C}$ ) when installed per Rosemount drawing 00848-4405; Class I, Division 2, Groups A, B, C, D; T3C( $-50\text{ °C} \leq T_a \leq +60\text{ °C}$ ) when installed per Rosemount drawing 00848-4405

### N6 Canada Division 2 and Dust-Ignitionproof (enclosure required)

**Certificate** 1261865

**Standards** CAN/CSA C22.2 No. 0-M91 (R2001), CSA Std. C22.2 No. 30-M1986, CAN/CSA C22.2 No. 94-M91, CSA Std. C22.2 No. 142-M1987, CSA Std. C22.2 No. 213-M1987, CSA Std. C22.2 No. 60529:05


**Markings** Class I, Division 2, Groups A, B, C, and D; T3C(-50 °C ≤ T<sub>a</sub> ≤ +60 °C) when installed per Rosemount drawing 00848-4405; Dust-Ignitionproof for Class II, Division 1, Groups E, F, and G; Class III; Conduit Seal Required

## Europe

### I1 ATEX Intrinsic Safety

**Certificate** Baseefa09ATEX0093X

**Standards** EN IEC 60079-0:2018, EN 60079-11:2012

**Markings**  II 1 G Ex ia IIC T4 Ga (-50 °C ≤ T<sub>a</sub> ≤ +60 °C) when installed per drawing 00848-4406

#### Special Conditions for Safe Use (X):


1. The equipment must be installed in an enclosure that provides a degree of protection of at least IP20. Non-metallic enclosures must be suitable to prevent electrostatic hazards and light alloy or zirconium enclosures must be protected from impact and friction when installed.
2. The equipment is not capable of withstanding the 500 V insulation test required by EN 60079-11:2011, clause 6.3.13. This must be taken into account when installing the equipment.

Fieldbus (input)	Sensor field terminal (output)
U <sub>i</sub> = 30 V	U <sub>o</sub> = 12.5 V
I <sub>i</sub> = 300 mA	I <sub>o</sub> = 4.8 mA
P <sub>i</sub> = 1.3 W	P <sub>o</sub> = 15 mW
C <sub>i</sub> = 2.1 nF	C <sub>o</sub> = 1.2 μF
L <sub>i</sub> = 0	L <sub>o</sub> = 1 H

### IA ATEX FISCO Intrinsic Safety

**Certificate** Baseefa09ATEX0093X

**Standards** EN IEC 60079-0:2018, EN 60079-11:2012

**Markings**  II 1 G Ex ia IIC T4 Ga (-50 °C ≤ T<sub>a</sub> ≤ +60 °C) when installed per drawing 00848-4406

#### Special Conditions for Safe Use (X):

1. The equipment must be installed in an enclosure that provides a degree of protection of at least IP20. Non-metallic enclosures must be suitable to prevent electrostatic hazards and light alloy or zirconium enclosures must be protected from impact and friction when installed.
2. The equipment is not capable of withstanding the 500 V insulation test required by EN 60079-11:2011, clause 6.3.13. This must be taken into account when installing the equipment.


FISCO (input)	Sensor field terminal (output)
U <sub>i</sub> = 17.5 V	U <sub>o</sub> = 12.5 V
I <sub>i</sub> = 380 mA	I <sub>o</sub> = 4.8 mA

FISCO (input)	Sensor field terminal (output)
$P_i = 5.32 \text{ W}$	$P_o = 15 \text{ mW}$
$C_i = 2.1 \text{ nF}$	$C_o = 1.2 \text{ }\mu\text{F}$
$L_i = 0$	$L_o = 1 \text{ H}$

### N1 ATEX Zone 2 (with enclosure)

**Certificate** Baseefa09ATEX0095X

**Standards** EN IEC 60079-0:2018, EN 60079-7:2015 + A1:2018, EN 60079-15:2010

**Markings**  II 3G Ex nA IIC T5 Gc (-40 °C ≤ T<sub>a</sub> ≤ +65 °C), Ex ec IIC T5 Gc (-40 °C ≤ T<sub>a</sub> ≤ +65 °C)


#### Special Conditions for Safe Use (X):

1. The equipment must only be installed in an area of pollution degree 2 or better, as defined in IEC 60664-1.
2. Provision must be made, external to the equipment, to ensure the rated voltage of the equipment supply is not exceeded by transient disturbances of more than 40 percent.
3. The electrical circuit is connected directly to earth; this must be taken into account when installing the apparatus.

### NC ATEX Zone 2 Component (without enclosure)

**Certificate** Baseefa09ATEX0094U

**Standards** EN IEC 60079-0:2018, EN 60079-7:2015 + A1:2018, EN 60079-15:2010

**Markings**  II 3G Ex nA IIC T4 Gc (-50 °C ≤ T<sub>a</sub> ≤ +85 °C) or Ex nA IIC T5 Gc (-50 °C ≤ T<sub>a</sub> ≤ +70 °C), Ex ec IIC T4 Gc (-50 °C ≤ T<sub>a</sub> ≤ +85 °C) or Ex ec IIC T5 Gc (-50 °C ≤ T<sub>a</sub> ≤ +70 °C)

#### Schedule of Limitations (U):

1. The equipment must only be installed in an area of pollution degree 2 or better, as defined in IEC 60664-1, and in an enclosure that provides a degree of protection of at least IP54 in accordance with EN 60079-0.
2. Provision must be made, external to the component, to ensure the rated voltage of the component supply is not exceeded by transient disturbances of more than 40 percent.
3. The electrical circuit is connected directly to earth; this must be taken into account when installing the apparatus.

## International

### I7 IECEx Intrinsic Safety

**Certificate** IECEx BAS 09.0030X

**Standards** IEC 60079-0:2017, IEC 60079-11:2011

**Markings** Ex ia IIC T4 Ga (-50 °C ≤ T<sub>a</sub> ≤ +60 °C)

**Special Conditions for Safe Use (X):**

1. The apparatus must be installed in an enclosure that provides a degree of protection of at least IP20. Non-metallic enclosures must be suitable to prevent electrostatic hazards and light alloy or zirconium enclosures must be protected from impact and friction when installed.
2. The apparatus is not capable of withstanding the 500 V insulation test required by IEC 60079-11:2011, clause 6.3.13. This must be taken into account when installing the apparatus.

**IG IECEx FISCO Intrinsic Safety**

<b>Certificate</b>	IECEX BAS 09.0030X
<b>Standards</b>	IEC 60079-0:2017, IEC 60079-11:2011
<b>Markings</b>	Ex ia IIC T4 Ga (-50 °C ≤ T <sub>a</sub> ≤ +60 °C)

**Special Conditions for Safe Use (X):**

1. The equipment must be installed in an enclosure that provides a degree of protection of at least IP20. Non-metallic enclosures must be suitable to prevent electrostatic hazards and light alloy or zirconium enclosures must be protected from impact and friction when installed.
2. The equipment is not capable of withstanding the 500 V insulation test required by EN 60079-11:2012, clause 6.3.13. This must be taken into account when installing the equipment.

FISCO (input)	Sensor field terminal (output)
U <sub>i</sub> = 17.5 V	U <sub>O</sub> = 12.5 V
I <sub>i</sub> = 380 mA	I <sub>O</sub> = 4.8 mA
P <sub>i</sub> = 5.32 W	P <sub>O</sub> = 15 mW
C <sub>i</sub> = 2.1 nF	C <sub>O</sub> = 1.2 μF
L <sub>i</sub> = 0	L <sub>O</sub> = 1 H

**N7 IECEx Type n (with enclosure)**

<b>Certificate:</b>	IECEX BAS 09.0032X
<b>Standards:</b>	IEC 60079-0:2017, IEC 60079-7:2017, IEC 60079-15:2010
<b>Markings:</b>	Ex nA IIC T5 Gc (-40 °C ≤ T <sub>a</sub> ≤ +65 °C), Ex ec IIC T5 Gc (-40 °C ≤ T <sub>a</sub> ≤ +65 °C)

**Special Conditions for Safe Use (X):**

1. The equipment must only be installed and used in an area of pollution degree 2 or better, as defined in IEC 60664-1.
2. Provision must be made, external to the apparatus, to ensure the rated voltage of the apparatus supply is not exceeded by transient disturbances of more than 40 percent.
3. The electrical circuit is connected directly to earth. This must be taken into account when installing the apparatus.

**NJ IECEx Type n (without enclosure)**

<b>Certificate:</b>	IECEX BAS 09.0031U
<b>Standards:</b>	IEC 60079-0:2017, IEC 60079-7:2017, IEC 60079-15:2010
<b>Markings:</b>	Ex nA IIC T4 Gc(-50 °C ≤ T <sub>a</sub> ≤ +85 °C), Ex nA IIC T5 Gc (-50 °C ≤ T <sub>a</sub> ≤ +70 °C), Ex ec IIC T4 Gc(-50 °C ≤ T <sub>a</sub> ≤ +85 °C), Ex ec IIC T5 Gc (-50 °C ≤ T <sub>a</sub> ≤ +70 °C)

**Schedule of Limitations (U):**

1. The component must be only installed and used in an area of pollution degree 2 or better, as defined in IEC 60664-1, and in an enclosure that provides a degree of protection of at least IP54 in accordance with IEC 60079-0
2. Provision must be made, external to the component, to ensure the rated voltage of the component supply is not exceeded by transient disturbances of more than 40 percent.
3. The electrical circuit is connected directly to earth; this must be taken into account when installing the apparatus.

## Brazil

### I2 Brazil Intrinsic Safety

**Certificate** UL-BR 16.0086X  
**Standards** ABNT NBR IEC 60079-0:2008 + Errata 1:2011 ABNT NBR IEC 60079-11:2009  
**Markings** Ex ia IIC T4(-50 °C ≤ T<sub>a</sub> ≤ +60 °C)

**Special Conditions for Safe Use (X):**

1. The apparatus must be installed in an enclosure that provides a degree of protection of at least IP20. Non-metallic enclosures must be suitable to prevent electrostatic hazards (see manufacturer's instructions manual) and light alloy or zirconium enclosures must be protected from impact and friction when installed.
2. The apparatus is not capable of withstanding the 500 V isolation test required by ABNT NBR IEC 60079-11. This must be taken into account when installing the apparatus --- see manufacturer's instructions manual.

Fieldbus (input)	Sensor field terminal (output)
U <sub>i</sub> = 30 V	U <sub>O</sub> = 12.5 V
I <sub>i</sub> = 300 mA	I <sub>O</sub> = 4.8 mA
P <sub>i</sub> = 1.3 W	P <sub>O</sub> = 15 mW
C <sub>i</sub> = 2.1 nF	C <sub>O</sub> = 1.2 μF
L <sub>i</sub> = 0	L <sub>O</sub> = 1 H

### IB Brazil Intrinsic Safety

**Certificate** UL-BR 16.0086X  
**Standards** ABNT NBR IEC 60079-0:2008 + Errata 1:2011, ABNT NBR IEC 60079-11:2009  
**Markings** Ex ia IIC T4(-50 °C ≤ T<sub>a</sub> ≤ +60 °C)

**Special Conditions for Safe Use (X):**

1. The apparatus must be installed in an enclosure that provides a degree of protection of at least IP20. Non-metallic enclosures must be suitable to prevent electrostatic hazards (see manufacturer's instructions manual) and light alloy or zirconium enclosures must be protected from impact and friction when installed.
2. The apparatus is not capable of withstanding the 500 V isolation test required by ABNT NBR IEC 60079-11. This must be taken into account when installing the apparatus --- see manufacturer's instruction manual.

FISCO (input)	Sensor field terminal (output)
U <sub>i</sub> = 17.5 V	U <sub>O</sub> = 12.5 V

FISCO (input)	Sensor field terminal (output)
$I_i = 380 \text{ mA}$	$I_o = 4.8 \text{ mA}$
$P_i = 5.32 \text{ W}$	$P_o = 15 \text{ mW}$
$C_i = 2.1 \text{ nF}$	$C_o = 1.2 \mu\text{F}$
$L_i = 0$	$L_o = 1 \text{ H}$

## China

### I3 China Intrinsic Safety

<b>Certificate</b>	GYJ21.1125X
<b>Standards</b>	GB3836.1-2010, GB3836.4-2010, GB3836.20-2010
<b>Markings</b>	Ex ia IIC T4/T5 Ga

产品安全使用特殊条件：

产品防爆合格证后缀“X”代表产品安全使用有特殊条件：

输出为 FOUNDATION Fieldbus 时：

- 温度变送器须安装于外壳防护等级不低于国家标准 GB4208-2008 规定的 IP20 的壳体中，方可用于爆炸性危险场所，金属壳体须符合国家标准 GB3836.1-2010 第 8 条的规定，非金属壳体须符合 GB3836.1-2010 第 7.4 条的规定。
- 此设备不能承受 GB3836.4-2010 标准中第 6.3.12 条规定的 500V 交流有效值试验电压的介电强度试验。

输出为 Wireless 时：

- 天线的表面电阻大于  $1 \text{ G}\Omega$ ，不允许用溶剂清洗或用于布擦拭，以避免电荷积聚。
- 电源模块表面电阻大于  $1 \text{ G}\Omega$ ，必须置于无线设备外壳内使用，现场安装及运输过程中避免电荷积聚。
- 产品需使用厂家提供的由 2 块 Tadiran TL-5920 Lithium Thionyl-Chloride 原电池组成的电池组。

产品使用注意事项：

- 产品环境温度为：

输出代码	温度组别	环境温度
F	T4	$-50 \text{ }^\circ\text{C} \leq T_a \leq + 60 \text{ }^\circ\text{C}$
W	T4	$-60 \text{ }^\circ\text{C} \leq T_a \leq + 70 \text{ }^\circ\text{C}$
	T5	$-60 \text{ }^\circ\text{C} \leq T_a \leq + 40 \text{ }^\circ\text{C}$

- 参数：

供电端 ( 1-2 )

输出代码	最高输入电压	最大输入电流	最大输入功率	最大内部等效参数	
	$U_i \text{ (V)}$	$I_i \text{ (mA)}$	$P_i \text{ (mW)}$	$C_i \text{ (}\mu\text{F)}$	$L_i \text{ (H)}$
F	30	300	1.3	2.1	0
F (FISCO)	17.5	380	5.32	2.1	0



注 1：上表中非 FISCO 参数必须来自于使用电阻限流的线性输出。

注 2：本安电气参数符合 GB3836.19-2010 对 FISCO 现场仪表的参数要求。当其连接符合 FISCO 模型的电路板时，其本安参数及内部最大等效参数见上表。

传感器端：

输出代码	端子	最高输出电压	最大输出电流	最大输出功率	最大外部等效参数	
		$U_o$ (V)	$I_o$ (mA)	$P_o$ (mW)	$C_o$ ( $\mu$ H)	$L_o$ (H)
F	1-8	12.5	4.8	15	1.2	1
F (FISCO)	1-20	6.6	3.2	5.3	22	1

- 输出代码为 F 时，该产品必须与已通过防爆认证的关联设备配套共同组成本安防爆系统方可用于爆炸性气体环境。其系统接线必须同时遵守本产品 and 所配关联设备的使用说明书要求，接线端子不得接错。
- 该产品于关联设备的连接电缆应为带绝缘护套的屏蔽电缆，其屏蔽层应为安全接地。
- 用户不得自行更换该产品的零部件，应会同产品制造商共同解决运行中出现的故障，以杜绝损坏现象的发生。产品的安装、使用和维护应同时遵守产品使用说明书、GB3836.13-2013“爆炸性环境 第 13 部分：设备的修理、检修、修复和改造”、GB3836.15-2000“爆炸性气体环境用电气设备 第 15 部分：危险场所电气安装（煤矿除外）”、GB3836.16-2006“爆炸性气体环境用电气设备 第 16 部分：电气装置的检查和维修（煤矿除外）”、GB3836.18-2010“爆炸性环境 第 18 部分：本质安全系统”和 GB50257-2014“电气装置安装工程爆炸和火灾危险环境电力装置施工及验收规范”的有关规定。

### N3 China Type n

<b>Certificate</b>	GYJ21.3428U
<b>Standards</b>	GB3836.1-2010, GB3836.8-2014
<b>Markings</b>	Ex nA IIC T4/T5 Gc

产品安全使用特殊条件：

- 设备不能承受 GB3836.8-2014 标准中第 6.5.1 条规定的 500V 耐压试验，安装时必须考虑在内。
- 此设备必须安装于具有不低于 IP54 外壳防护等级的 Ex 元件外壳，外壳应符合 GB3836.1-2010 和 GB3836.8-2014 标准中对外壳材料和环境的相关要求。
- 在此设备外部应采取措​​施以防额定电压因瞬态干扰而超过 40%。

产品使用注意事项：

- 产品使用环境温度范围：

温度组别	环境温度
T4	$-50^{\circ}\text{C} \leq T_a \leq +85^{\circ}\text{C}$
T5	$-50^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$

- 最高工作电压：42.4V。
- 用户不得自行更换该产品的零部件，应会同产品制造商共同解决运行中出现的故障，以杜绝损坏现象的发生。
- 产品的安装、使用和维护应同时遵守产品使用说明书、GB3836.13-2013“爆炸性环境 第 13 部分：设备的修理、检修、修复和改造”、GB3836.15-2000“爆炸性气体环境用电气设备 第 15 部分：危险场所电气安装（煤矿除外）”、GB3836.16-2006“爆炸性气体环境用电气设备 第 16 部分：电气装置的检查和维修（煤矿除外）”、B50257-2014“电气装置安装工程爆炸和火灾危险环境电力装置施工及验收规范”的有关规定。

## Japan

### I4 Japan FISCO Intrinsic Safety (ia)

<b>Certificate</b>	TC19713
<b>Markings</b>	ia IIC T4

### Japan Wi-HART Intrinsic Safety (ia)

<b>Certificate</b>	TC19154
<b>Markings</b>	ia IIC T4

### H4 Japan FISCO Intrinsic Safety (ib)

<b>Certificate</b>	TC20737
<b>Markings</b>	ia IIC T4

## Korea

### IP Korea Intrinsic Safety

<b>Certificate</b>	20-KA4BO-0921X
<b>Markings</b>	Ex ia IIC T4 (-50 °C ≤ T <sub>a</sub> ≤ +60 °C)

## EAC - Belarus, Kazakhstan, Russia

### IM Technical Regulation Customs Union (EAC) Intrinsic Safety

<b>Markings</b>	[FOUNDATION Fieldbus]: 0Ex ia IIC T4 Ga X, T4(-50 °C ≤ T <sub>a</sub> ≤ +60 °C) See certificate for entity parameters.
-----------------	---

#### Special Condition for Safe Use (X):

See certificate for special conditions.

### IN Technical Regulation Customs Union (EAC) FISCO

<b>Markings:</b>	[FISCO]: 0Ex ia IIC T4 Ga X, T4(-50 °C ≤ T <sub>a</sub> ≤ +60 °C) See certificate for entity parameters.
------------------	---

#### Special Condition for Safe Use (X):


See certificate for special conditions.

## Combinations

**KG** Combination of I1/IA, I5/IE, I6/IF, and I7/IG

## Conduit Plugs and Adapters

### ATEX Flameproof and Increased Safety

**Certificate** FM13ATEX0076X  
**Standards** EN 60079-0:2012, EN 60079-1:2007, IEC 60079-7:2007  
**Markings:**  2 G Ex de IIC Gb

#### Special Conditions for Safe Use (X):

1. When the thread adapter or blanking plug is used with an enclosure in type of protection increased safety “e” the entry thread shall be suitably sealed in order to maintain the ingress protection rating (IP) of the enclosure.
2. The blanking plug shall not be used with an adapter.
3. Blanking Plug and Threaded Adapter shall be either NPT or Metric thread forms. G½ and PG 13.5 thread forms are only acceptable for existing (legacy) equipment installations.

### IECEx Flameproof and Increased Safety

**Certificate** IECEx FMG 13.0032X  
**Standards** IEC 60079-0:2011, IEC 60079-1:2007, IEC 60079-7:2006-2007  
**Markings** Ex de IIC Gb

#### Special Conditions for Safe Use (X):

1. When the thread adapter or blanking plug is used with an enclosure in type of protection increased safety “e” the entry thread shall be suitably sealed in order to maintain the ingress protection rating (IP) of the enclosure.
2. The blanking plug shall not be used with an adapter.
3. Blanking Plug and Threaded Adapter shall be either NPT or Metric thread forms. G½ and PG 13.5 thread forms are only acceptable for existing (legacy) equipment installations.

**Table 7: Conduit Plug Thread Sizes**

Thread	Identification mark
M20 x 1.5	M20
½–14 NPT	½ NPT
G½	G½

**Table 8: Thread Adapter Thread Sizes**

Male thread	Identification mark
M20 x 1.5–6H	M20
½–14 NPT	½–14 NPT
¾–14 NPT	¾–14 NPT
Female thread	Identification mark
M20 x 1.5–6H	M20

**Table 8: Thread Adapter Thread Sizes (continued)**

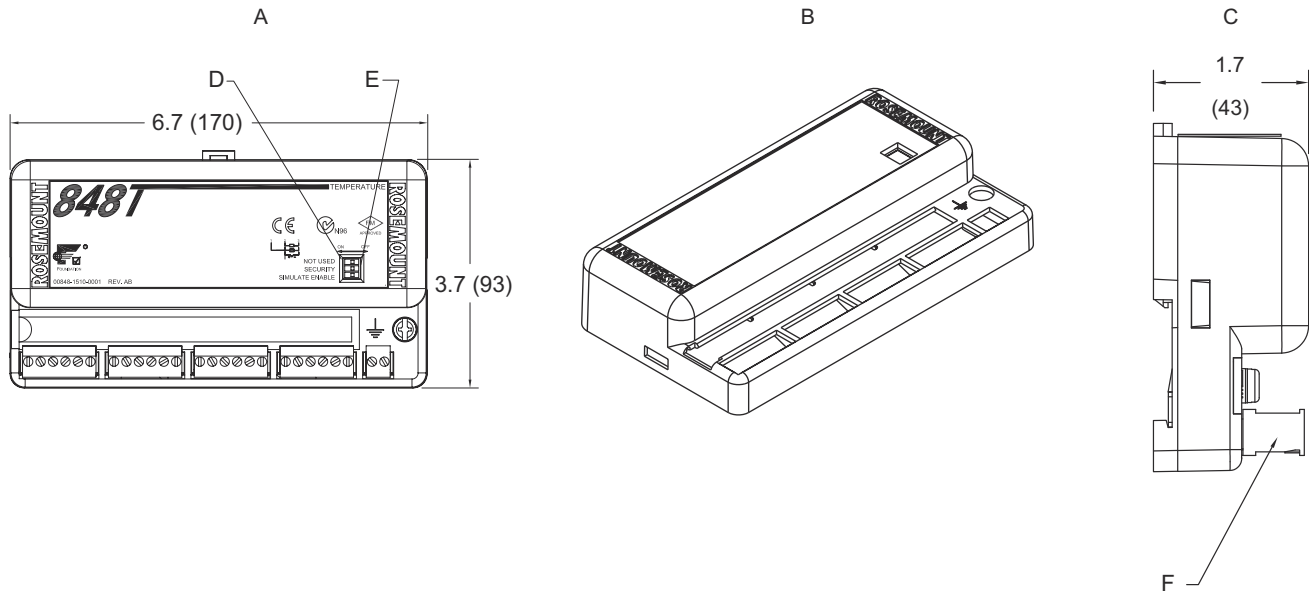
<b>Male thread</b>	<b>Identification mark</b>
½-14 NPT	½-14 NPT
PG 13.5	PG 13.5

# Dimensional drawings for Rosemount 848T FOUNDATION Fieldbus

## Junction boxes

External dimensions for junction boxes with no entries are the same as those outlined for the other junction box materials in this section.

**Figure 3: Rosemount 848T**

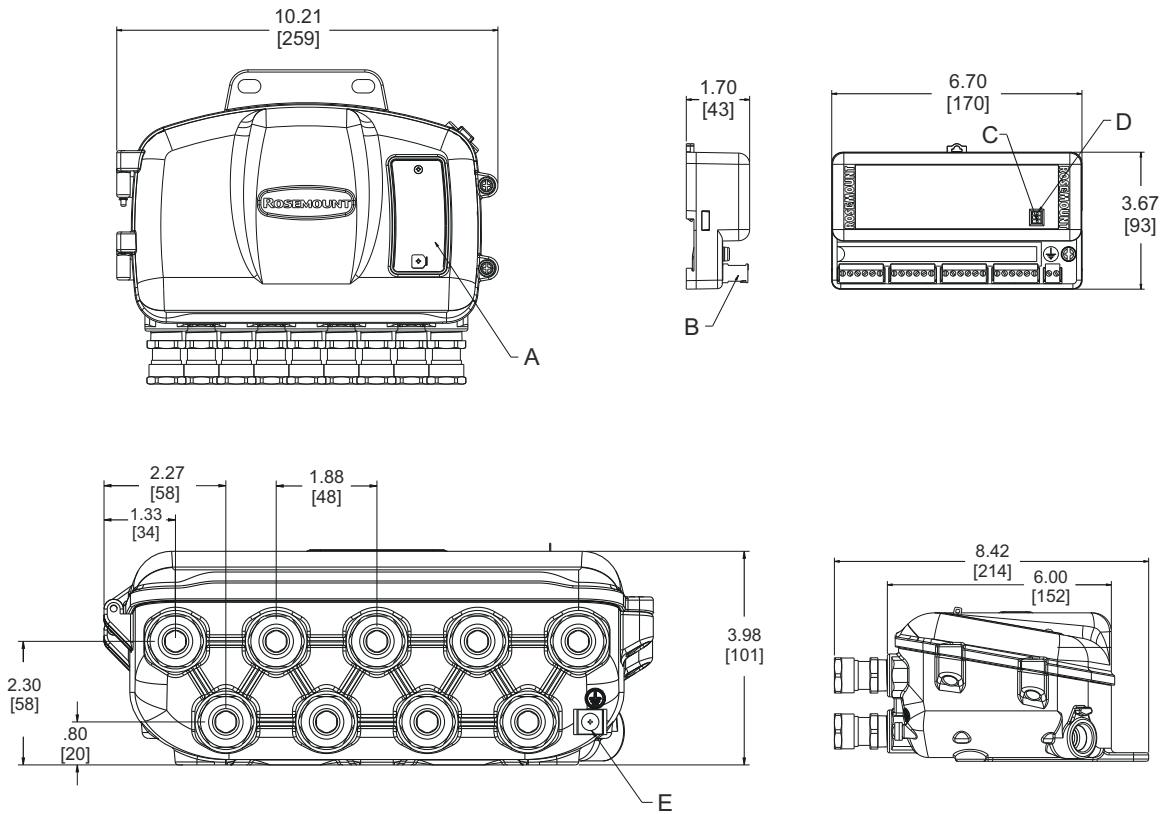


Dimensions are in inches (millimeters).

- A. Top view
- B. 3-D view
- C. Side view
- D. Security switch
- E. Simulation switch
- F. Removable wiring connection

## Aluminum junction box

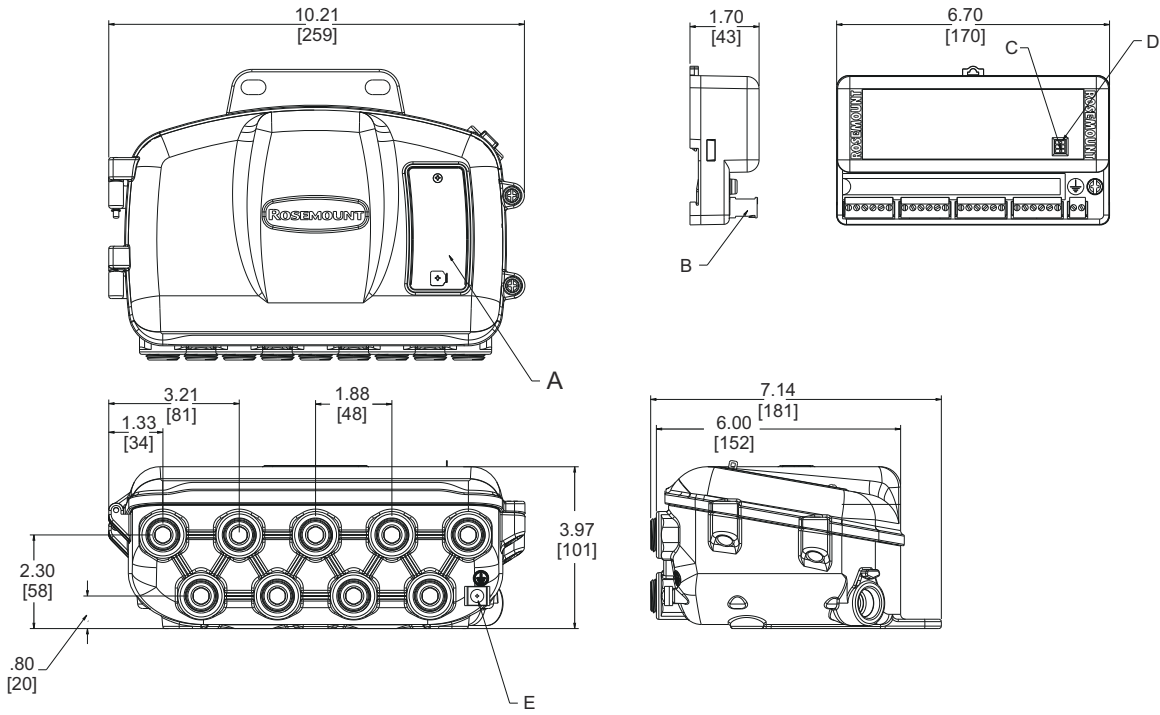
Figure 4: Aluminum junction box with cable glands (option code JA4)



- A. Nameplate
- B. Removable wiring connector
- C. Security switch
- D. Simulation switch
- E. External ground screw (optional)

Dimensions are in inches (millimeters).

Figure 5: Aluminum junction box with plugged holes (option code JA5)

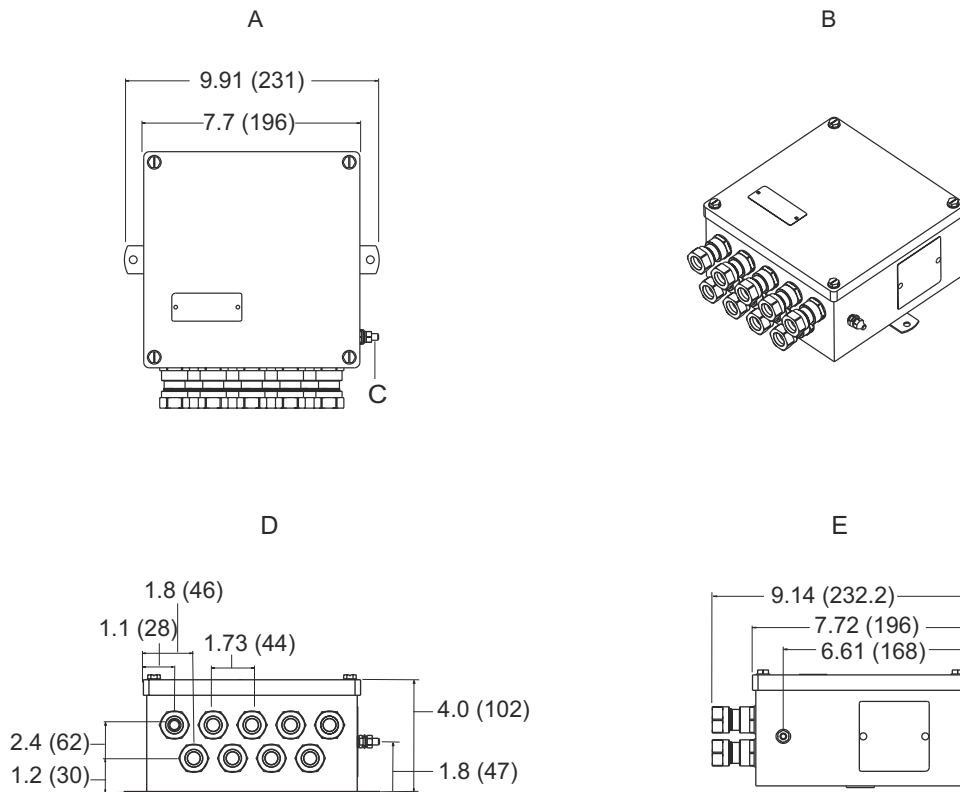


- A. Nameplate
- B. Removable wiring connection
- C. Security switch
- D. Simulation switch
- E. External ground screw (optional)

Dimensions are in inches (millimeters).

## Stainless steel junction box

Figure 6: Stainless steel junction box with cable glands (option code JS2)

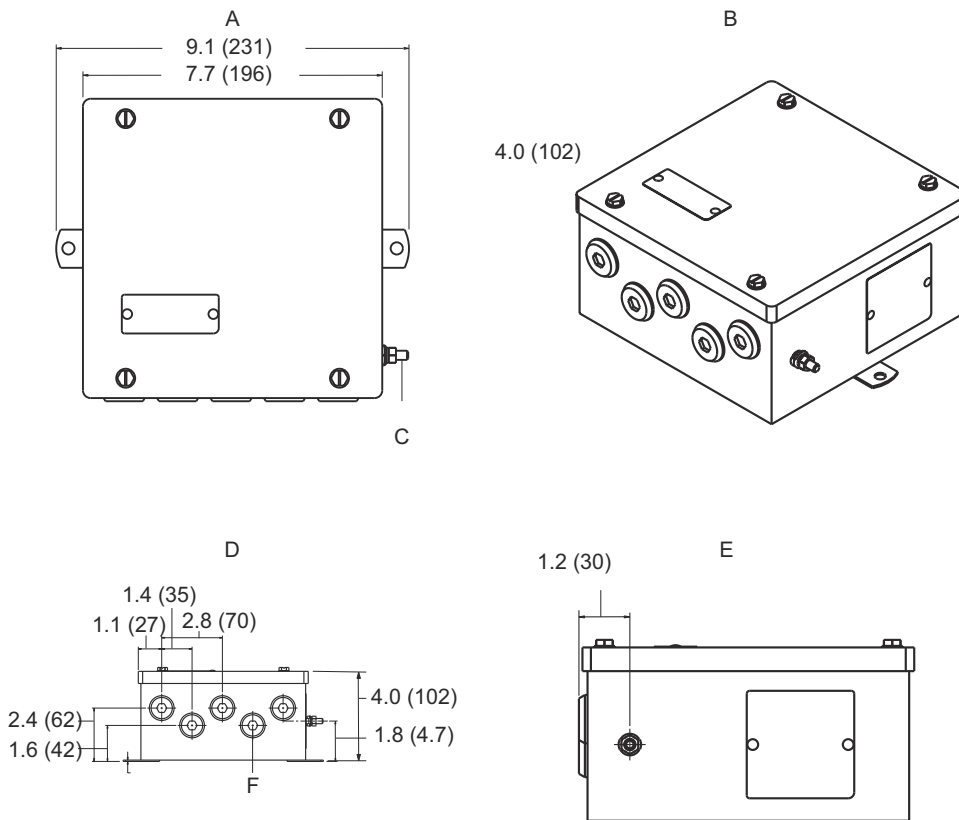


- A. Top view
- B. 3-D view
- C. Ground screw
- D. Front view
- E. Side view

Dimensions are in inches (millimeters).



**Figure 7: Stainless steel junction box with a conduit entry (option code JS3)**

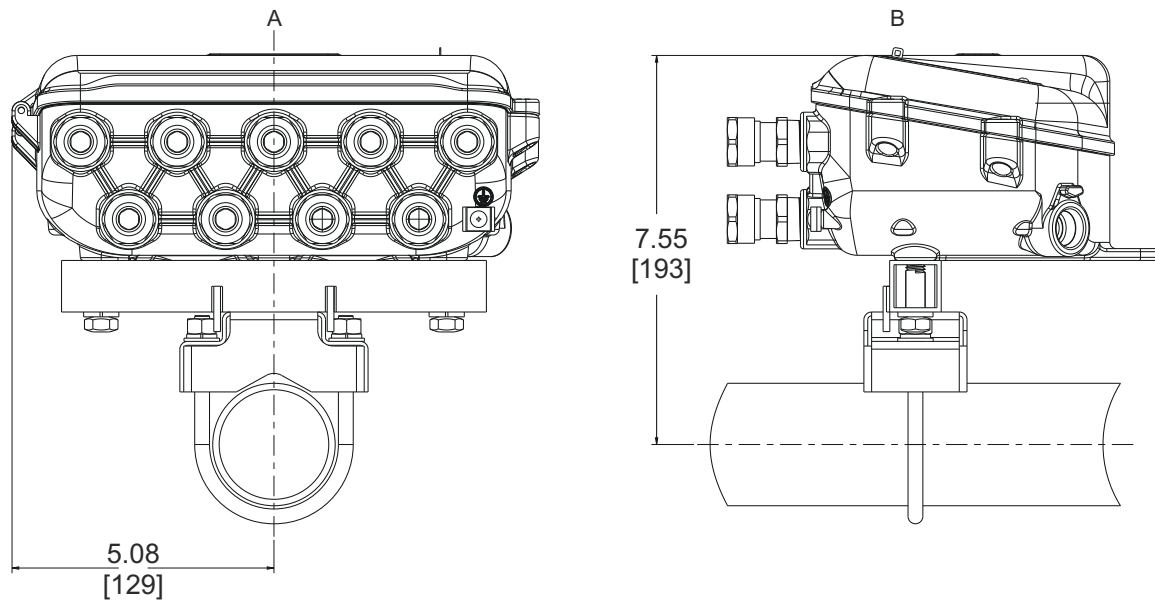


- A. Top view
- B. 3-D view
- C. Ground screw
- D. Front view
- E. Side view
- F. Five plugged 0.86 in (21.8 mm) diameter holes suitable for installing 1/2-in. NPT fittings

Dimensions are in inches (millimeters).

## Mounting options

Figure 8: Mount an aluminum junction box

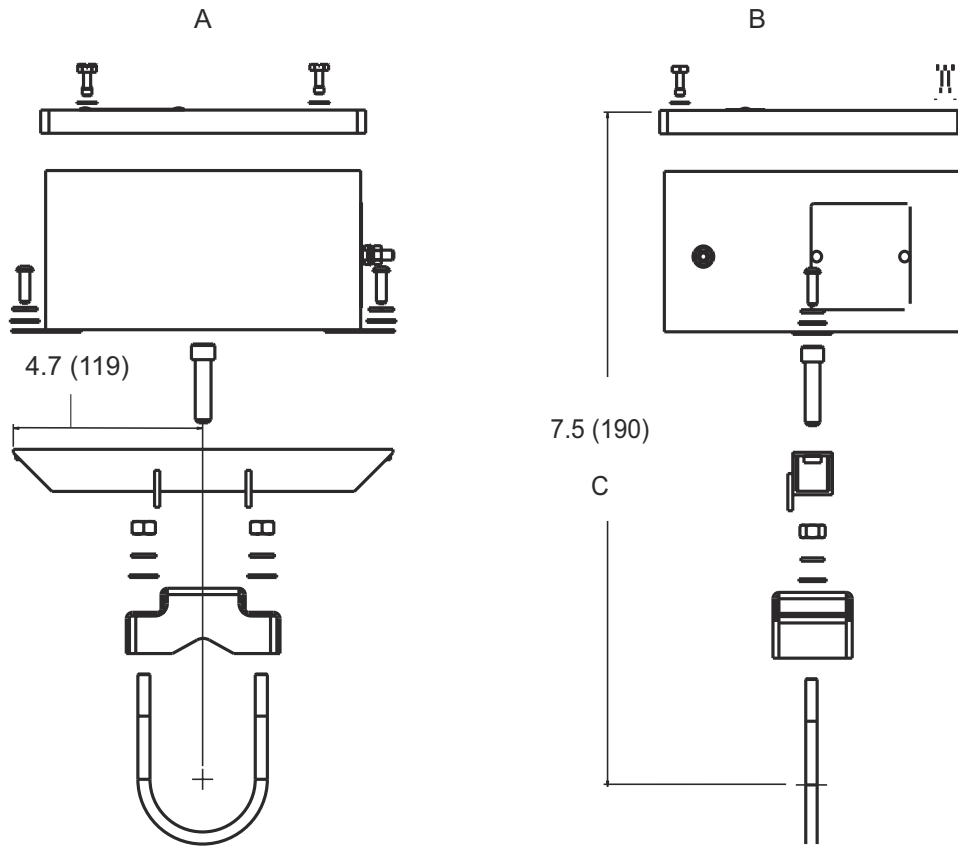


A. Front view

B. Side view

Dimensions are in inches (millimeters)

**Figure 9: Mount a stainless steel junction box**



- A. Front view
- B. Side view
- C. Fully assembled

Dimensions are in inches (millimeters)

**Figure 10: Mount aluminum on a vertical pipe**

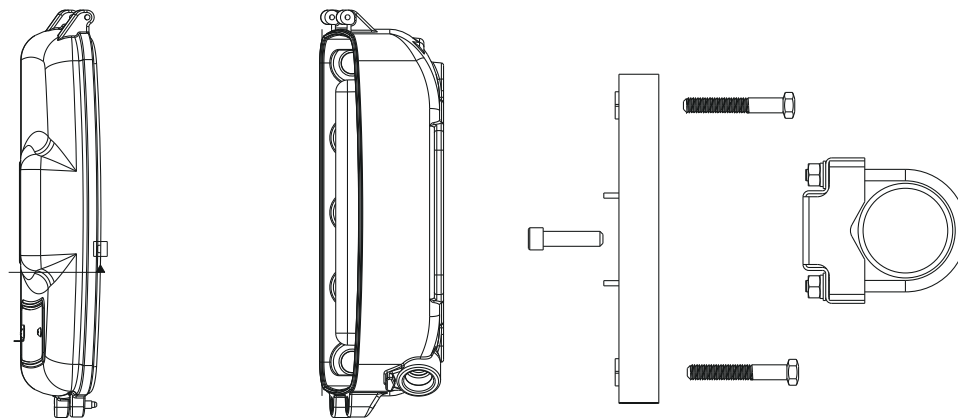
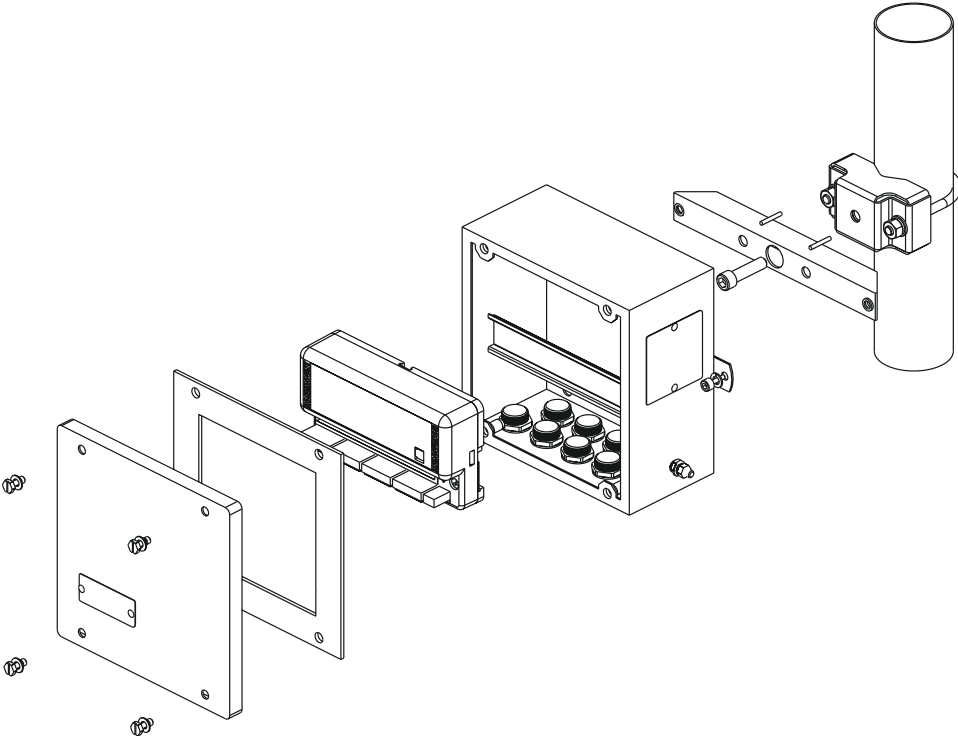


Figure 11: Mount stainless steel on vertical pipe



# Rosemount 848T Wireless Temperature Transmitter



The Rosemount 848T is the premier choice for Wireless High Density measurements. Four independently configurable inputs are transmitted through *WirelessHART*<sup>®</sup>. Costs per point are dramatically reduced through the use of smart wireless networks, with the same reliability and security of wired solutions. Additionally, the field hardened enclosure is suitable for installation in IS areas. Capabilities include:

Four independently configurable inputs, including 2-, 3- and 4-wire RTDs, thermocouples, 0-1000 mV and 0-10V, 2-, 3- and 4-wire ohms, and 4-20 mA signals.

<a href="#">CONFIGURE &gt;</a>	<a href="#">VIEW PRODUCT &gt;</a>
--------------------------------	-----------------------------------

## Online product configurator

Many products are configurable online using our Product Configurator. Select the **Configure** button or visit our [website](#) to start. With this tool's built-in logic and continuous validation, you can configure your products more quickly and accurately.

## Model codes

Model codes contain the details related to each product. Exact model codes will vary; an example of a typical model code is shown in the following figure.

Figure 12: Model Code Example

<b>3144P D1 A 1 NA</b>	<b>M5 DA1 Q4</b>
<b>1</b>	<b>2</b>

1. Required model components (choices available on most)
2. Additional options (variety of features and functions that may be added to products)

## Specifications and options

See the Specifications and options section for more details on each configuration. Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See the Material selection section for more information.

## Optimizing lead time

The starred offerings (★) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

## Required model components

### Model

Code	Description	
848T	High Density Temperature Measurement Family	★

### Product certification

Code	Description	
I1	ATEX Intrinsic Safety	★
I2	INMETRO Intrinsic Safety	★
I3	NEPSI Intrinsic Safety	★
I4	TIIS Intrinsic Safety	★
I5	FM Intrinsically Safe	★
I6	CSA Intrinsically Safe	★
I7	IECEX Intrinsic Safety	★
N5	FM Class I, Division 2, and Dust Ignition-proof (enclosure required)	★
N6	CSA Class I, Division 2	★
IM	Technical Regulations Customs Union (EAC) Intrinsic Safety	★
NA	No Approval	★

### Transmitter output

Code	Description	
X	Wireless	★

### Input type

Code	Description	
S001	RTD, thermocouple, mV, ohm inputs	★
S002 <sup>(1)</sup>	RTD, thermocouple, mV, ohm and 4–20 mA inputs	★

(1) Only available with product certifications NA and N5. Stable resistors included.

## Additional options

### Wireless update rate, operating frequency, and protocol

Code	Description	
WA3	User configurable update rate, 2.4 GHz, <i>Wireless</i> HART	★

### Omnidirectional wireless antenna and SmartPower™

Black power module must be shipped separately, order Model 701PBKKF.

Code	Description	
WK1	Long Range, Integral Antenna, Power Module Adapter, Intrinsically Safe (Power Module separate)	★
WM1	Extended Range, External Antenna, Adapter for Black Power Module (I.S. Power Module Sold Separately)	★

### Mounting bracket

Code	Description	
B6	Mounting bracket for 2 in (51 mm) pipe mounting – SST bracket and bolts	★

### Enclosure options

Option HA1 or HA2 required for wireless.

Code	Description	
HA1	Aluminum with cable glands (5 × ½-in. NPT for 7.5-11.9 mm)	★
HA2	Aluminum with conduit entries (5 plugged holes, suitable for installing ½-in. NPT fittings)	★

### Software configuration

Code	Description	
C1	Custom configuration of date, descriptor, message, and wireless parameters (requires CDS with order)	★

### Line filter

Code	Description	
F5	50 Hz line voltage filter	★
F6	60 Hz line voltage filter	★

### 5-point calibration

Code	Description	
C4	5-point calibration (requires Q4 option code to generate a calibration certificate)	★

**Calibration certificate**

Code	Description	
Q4	Calibration certificate (3-point calibration)	★

**Shipboard certification**

Code	Description	
SBS	American Bureau of Shipping (ABS) Type Approval	★
SBV	Bureau Veritas (BV) Type Approval	★
SDN	Det Norske Veritas (DNV) Type Approval	★
SLL	Lloyd's Register (LR) Type Approval	★

**Special temperature test**

Code	Description	
LT	Test to -60 °F (-51 °C)	★

**Conduit electrical connector**

Code	Description	
GE	M12, 4-pin, male connector (eurofast®)	★
GM	A size mini, 4-pin, male connector (minifast®)	★

**Extended product warranty**

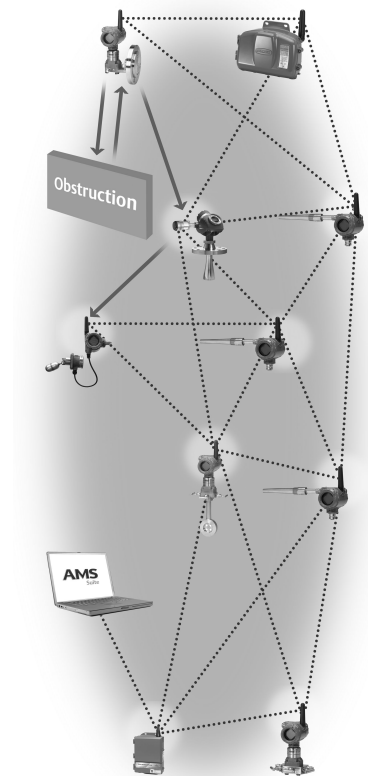
Code	Description	
WR3	3-year limited warranty	★
WR5	5-year limited warranty	★



## WirelessHART...industry standard

### Self-organizing adaptive mesh routing

- No wireless expertise required—devices automatically find the best communication paths
- Network continuously monitors paths for degradation and repairs itself
- Adaptive behavior provides reliable, hands-off operation and simplifies network deployments, expansion, and reconfiguration
- Supports both star and mesh topologies



### Industry standard radio with channel hopping

- Standard IEEE 802.15.4 radios
- 2.4 GHz ISM band sliced into 16 radio-channels
- Continually “hop” across channels to avoid interference and increase reliability
- Frequency hopping spread spectrum (FHSS) technology delivers high reliability in challenging radio environment

### Self-healing network

- If an obstruction is introduced into the mesh network, devices will automatically find the best alternate communication path.
- This allows the network to instantly change to the new path without any loss in data.

### Seamless integration to existing hosts

- Transparent and seamless integration
- Same control system applications
- Gateways connect using industry protocols

# Specifications for Rosemount 848T Wireless

## Functional specifications

### Input

Four independently configurable input channels that supports Thermocouple, RTD, mV, 0–10 V, ohm, and 4–20 mA, input types. See [Accuracy](#) for sensor options.

### Output

IEC 62591 (*WirelessHART*), 2.4 GHz DSSS

### Ambient temperature limits

-40 °F (-40 °C) to 185 °F (85 °C)

### Humidity limits

0–99 percent non-condensing relative humidity

### Update rate

User selectable, 4 seconds to 60 minutes

### Accuracy

(Pt 100 at reference condition: 20 °C)

±0.54 °F (±0.30 °C)

For the complete list see [Accuracy](#).

### Isolation

Isolation between all sensor channels is rated to 10 Vdc over all operating conditions. No damage will occur to the device with up to 250 Vdc between any sensor channels.

### Alerts

Message sent when open or short sensor is detected

### Electromagnetic Compatibility (EMC)

Meets all industrial environment requirements of EN61326 and NAMUR NE-21. Maximum deviation < 1 percent span during EMC disturbance.

### Transmitter stability

- ±0.15 percent of reading or 0.27 °F (0.15 °C), whichever is greater, for two years for RTDs
- ±0.15 percent of reading or 0.27 °F (0.15 °C), whichever is greater, for one year for thermocouples

### 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.

**Vibration effect**

Tested to the following with no effect on performance per IEC 60770-1, 1999.

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

## Physical specifications

### Material selection

Emerson provides a variety of Rosemount product with various product options and configurations including materials of construction that can be expected to perform well in a wide range of applications. The Rosemount product information presented is intended as a guide for the purchaser to make an appropriate selection for the application. It is the purchaser's sole responsibility to make a careful analysis of all process parameters (such as all chemical components, temperature, pressure, flow rate, abrasives, contaminants, etc.), when specifying product, materials, options and components for the particular application. Emerson is not in a position to evaluate or guarantee the compatibility of the process fluid or other process parameters with the product, options, configuration or materials of construction selected.

### Conformance to specifications ( $\pm 3\sigma$ [Sigma])

Technology leadership, advanced manufacturing techniques, and statistical process control ensure specification conformance to at least  $\pm 3\sigma$ .

### Electrical connections

#### Power module

The Emerson SmartPower™ power module is field replaceable, featuring keyed connections that eliminate the risk of incorrect installation. The power module is an Intrinsically Safe solution, containing the Lithium-thionyl chloride with a polybutadine terephthalate (PBT) enclosure. The 848T Wireless has a power module life time rating of six years with a one-minute update rate, at reference conditions.<sup>(3)</sup>

#### Sensor terminals

Sensor terminals permanently fixed to terminal block.

### Field Communicator connections

#### Communication terminals

Clips permanently fixed to terminal block.

(3) Reference conditions are 68 °F (20 °C), and routing data for three additional network devices. Note: Continuous exposure to ambient temperature limits -40 °F (-40 °C) or 185 °F (85 °C) may reduce specified life to less than 20 percent.

## Materials of construction

### Enclosure

Component	Material
Housing	Low-copper aluminum
Paint	Polyurethane
Cover O-ring	Silicone

### Terminal block and power module

PBT

### Antenna

PBT/Polycarbonate (PC) integrated omni-directional antenna

## Mounting

Transmitter can be panel mounted, or be mounted onto a 2-in. pipe stand (with option code B6). Sensors must be remotely mounted, as transmitter conduit entries are not designed for direct sensor mounting.

## Weight

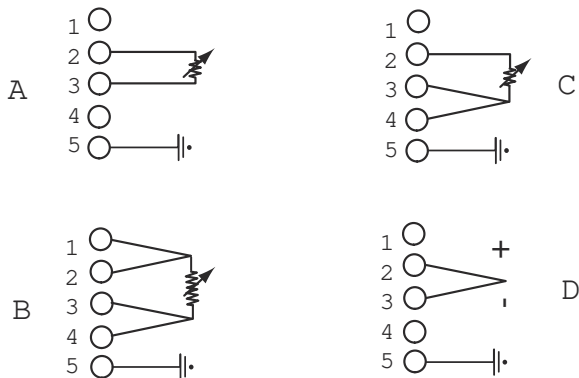
Rosemount 848T Wireless - 4.75 lb (2.2 kg)

## Enclosure ratings (Rosemount 848T Wireless)

Housing option codes HA1 or HA2 are Type 4x and IP66.

### Sensor connections

**Figure 13: Rosemount 848T Wireless Sensor Connections Diagram**



- A. 2-wire RTD and  $\Omega$
- B. 4-wire RTD and  $\Omega$
- C. 3-wire RTD and  $\Omega$
- D. Thermocouple and mV

## Accuracy

**Table 9: 2-, 3-, and 4-wire RTDs**

Sensor option	Sensor reference	Input ranges		Accuracy over range(s)	
		°C	°F	°C	°F
Pt 50 ( $\alpha = 0.00391$ )	GOST 6651-94	-200 to 550	-328 to 1022	$\pm 0.57$	$\pm 1.03$
Pt 100 ( $\alpha = 0.00391$ )	GOST 6651-94	-200 to 550	-328 to 1022	$\pm 0.28$	$\pm 0.50$
Pt 100 ( $\alpha = 0.00385$ )	IEC 751; $\alpha = 0.00385, 1995$	-200 to 850	-328 to 1562	$\pm 0.30$	$\pm 0.54$
Pt 100 ( $\alpha = 0.003916$ )	JIS 1604, 1981	-200 to 645	-328 to 1193	$\pm 0.30$	$\pm 0.54$
Pt 200 ( $\alpha = 0.00385$ )	IEC 751; $\alpha = 0.00385, 1995$	-200 to 850	-328 to 1562	$\pm 0.54$	$\pm 0.98$
PT 200 ( $\alpha = 0.003916$ )	JIS 1604, 1981 ( $= 0.003916$ )	-200 to 645	-328 to 1193	$\pm 0.54$	$\pm 0.98$
Pt 500 ( $\alpha = 0.00385$ )	IEC 751; $\alpha = 0.00385, 1995$	-200 to 850	-328 to 1562	$\pm 0.38$	$\pm 0.68$
Pt 1000 ( $\alpha = 0.00385$ )	IEC 751; $\alpha = 0.00385, 1995$	-200 to 300	-328 to 572	$\pm 0.40$	$\pm 0.72$
Ni 120	Edison Curve No. 7	-70 to 300	-94 to 572	$\pm 0.30$	$\pm 0.54$
Cu 10	Edison Copper Winding No. 15	-50 to 250	-58 to 482	$\pm 3.20$	$\pm 5.76$
Cu 100 ( $a=428$ )	GOST 6651-94	-185 to 200	-301 to 392	$\pm 0.48$	$\pm 0.86$
Cu 50 ( $a=428$ )	GOST 6651-94	-185 to 200	-301 to 392	$\pm 0.96$	$\pm 1.73$
Cu 100 ( $a=426$ )	GOST 6651-94	-50 to 200	-58 to 392	$\pm 0.48$	$\pm 0.86$
Cu 50 ( $a=426$ )	GOST 6651-94	-50 to 200	-58 to 392	$\pm 0.96$	$\pm 1.73$

**Table 10: Thermocouples — cold junction adds + 0.5 °C to listed accuracy**

Sensor option	Sensor reference	Input ranges		Accuracy over range(s)	
		°C	°F	°C	°F
NIST Type B (Accuracy varies according to input range)	NIST Monograph 175	100 to 300	212 to 572	$\pm 6.00$	10.80
		301 to 1820	573 to 3308	$\pm 1.54$	$\pm 2.78$
NIST Type E	NIST Monograph 175	-200 to 1000	-328 to 1832	$\pm 0.40$	$\pm 0.72$
NIST Type J	NIST Monograph 175	-180 to 760	-292 to 1400	$\pm 0.70$	$\pm 1.26$
NIST Type K	NIST Monograph 175	-180 to 1372	-292 to 2502	$\pm 1.00$	$\pm 1.80$
NIST Type N	NIST Monograph 175	-200 to 1300	-328 to 2372	$\pm 1.00$	$\pm 1.80$
NIST Type R	NIST Monograph 175	0 to 1768	32 to 3214	$\pm 1.50$	$\pm 2.70$

**Table 10: Thermocouples – cold junction adds + 0.5 °C to listed accuracy (continued)**

Sensor option	Sensor reference	Input ranges		Accuracy over range(s)	
		°C	°F	°C	°F
NIST Type S	NIST Monograph 175	0 to 1768	32 to 3214	± 1.40	± 2.52
NIST Type T	NIST Monograph 175	-200 to 400	-328 to 752	± 0.70	± 1.26
DIN L	DIN 43710	-200 to 900	-328 to 1652	± 0.70	± 1.26
DIN U	DIN 43710	-200 to 600	-328 to 1112	± 0.70	± 1.26
w5Re/W26Re	ASTME 988-96	0 to 2000	32 to 3632	± 1.60	± 2.88
Type L	GOST R.8.585-2001	-200 to 800	-328 to 1472	±0.71	±1.28
Terminal Temperature		-50 to 85	-58 to 185	±3.50	±6.30
<b>Input units</b>					
Ohm input		0 to 2000 ohms		±0.90 ohms	
Millivolt input		-10 to 100 mV		±0.05 mV	
1000 mV input		-10 to 1000 mV		±1.0 mV	
4–20 mA (Rosemount) <sup>(1)</sup>		4–20 mA ±0.01		±0.01 mA	
4–20 mA (NAMUR) <sup>(1)</sup>		4–20 mA ±0.01		±0.01 mA	

(1) Requires the S002 option code.

**Analog sensors 4–20 mA**

Two types of alarm levels are available with 4–20 mA sensors on the Rosemount 848T. These types must be ordered with the S002 option code complete with an analog connector kit. The alarm levels, accuracy for each type are listed in the table below.

**Table 11: Analog sensors**

Sensor option	Alarm levels	Accuracy
4–20 mA (Rosemount Standard)	3.9 to 20.8 mA	± 0.01 mA
4–20 mA (NAMUR)	3.8 to 20.5 mA	± 0.01 mA

**Ambient temperature effect**

Transmitters may be installed in locations where the ambient temperature is between -40 °F (-40 °C) and 185 °F (85 °C).

**Table 12: RTD**

NIST type	Accuracy per 1.8 °F (1.0 °C) change in ambient temperature <sup>(1)(2)</sup>	Temperature range (°C)
Pt 50 (α = 0.003910)	0.004 °C (0.0072 °F)	N/A
Pt 100 (α = 0.00391)	0.002 °C (0.0036 °F)	N/A
Pt 100 (α = 0.00385)	0.003 °C (0.0054 °F)	N/A
Pt 100 (α = 0.003916)	0.003 °C (0.0054 °F)	N/A
Pt 200 (α = 0.00385)	0.004 °C (0.0072 °F)	N/A
PT 200 (α = 0.003916)	0.004 °C (0.0072 °F)	N/A

**Table 12: RTD (continued)**

NIST type	Accuracy per 1.8 °F (1.0 °C) change in ambient temperature <sup>(1)(2)</sup>	Temperature range (°C)
Cu 10	0.03 °C (0.054 °F)	N/A
Pt 500	0.003 °C (0.0054 °F)	N/A
Pt 1000	0.003 °C (0.0054 °F)	N/A
Cu 100 (a=428)	0.002 °C (0.0036 °F)	N/A
Cu 50 (a=428)	0.004 °C (.0072 °F)	N/A
Cu 100 (a=426)	0.002 °C (0.0036 °F)	N/A
Cu 50 (a=426)	0.004 °C (.0072 °F)	N/A
Ni 120	0.003 °C (0.0054 °F)	N/A

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

(2) Ambient temperature affects valid specifications over a minimum temperature span of 50 °F (28 °C).

**Table 13: Thermocouple (R = the value of the reading)**

NIST type	Accuracy per 1.8 °F (1.0 °C) change in ambient temperature <sup>(1)(2)</sup>	Temperature range (°C)
Type B	0.014 °C 0.032 °C - (0.0025% of [R - 300]) 0.054 °C - (0.011% of [R - 100])	R ≥ 1000 300 ≤ R < 1000 100 ≤ R < 300
Type E	0.005 °C + (0.00043% of R)	All
Type J, Din Type L	0.0054 °C + (0.00029% of R) 0.0054 °C + (0.0025% of  R )	R ≥ 0 R < 0
Type K	0.0061 °C + (0.00054% of R) 0.0061 °C + (0.0025% of  R )	R ≥ 0 R < 0
Type N	0.0068 °C + (0.00036% of R)	All
Type R, Type S	0.016 °C 0.023 °C - (0.0036% of R)	R ≥ 200 R < 200
Type T, DIN Type U	0.0064 °C 0.0064 °C - (0.0043% of  R )	R ≥ 0 R < 0
GOST Type L	0.007 °C 0.007 °C + (0.003% of IRI)	R ≥ 0 R < 0
<b>Input units</b>		
Ohm input	0.0084 ohms	N/A
100 mV input	0.0005 mV	N/A
1000 mV input	0.005 mV	N/A
4–20 mA (Rosemount)	0.0001 mA	N/A
4–20 mA (NAMUR)	0.0001 mA	N/A

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

(2) Ambient temperature affects valid specifications over a minimum temperature span of 50 °F (28 °C).

## Ambient temperature notes

### Examples

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

- Ambient temperature effects:  $0.00385 \text{ °C} \times (30 - 20) = 0.0385 \text{ °C}$
- Worst case error: Sensor accuracy + Ambient temperature effects =  $0.30 \text{ °C} + 0.0385 \text{ °C} = 0.3385 \text{ °C}$
- Total probable error:

$$\sqrt{0.30^2 + 0.0385^2} = 0.30 \text{ °C}$$



# Product certifications

Rev 1.11

## Telecommunication compliance

All wireless devices require certification to ensure that they adhere to regulations regarding the use of the RF spectrum. Nearly every country requires this type of product certification. Emerson is working with governmental agencies around the world to supply fully compliant products and remove the risk of violating country directives or laws governing wireless device usage.

## FCC and IC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: This device may not cause harmful interference. This device must accept any interference received, including interference that may cause undesired operation. This device must be installed to ensure a minimum antenna separation distance of 20 cm from all persons.

## European Directive Information

A copy of the EC Declaration of Conformity can be found at the end of the Quick Start Guide. The most recent revision of the EC Declaration of Conformity can be found at [Emerson.com/Rosemount](https://www.emerson.com/Rosemount).

## 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 FM Approvals, a nationally recognized test laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

## 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.

## USA

### I5 USA Intrinsically Safe

**Certificate** 3034378

**Standards** FM Class 3600:1998, FM Class 3610:2010, FM Class 3810:2005, NEMA®-250:1997, ANSI/ISA-60079-0:2009, ANSI/ISA-60079-11:2009, IEC 60529:2004

**Markings** IS CL I, DIV 1, GP A, B, C, D; NI CL I, DIV 2, GP A, B, C, D; IS CL I, Zone 0, AEx ia IIC T4(-50 °C ≤ T<sub>a</sub> ≤ +70 °C) , when installed per Rosemount drawing 00849-1000; Type 4X; IP66

See [Table](#) at the end of the Product Certifications section for entity parameters.

## N5 USA Class 1, Division 2, and Dust Ignition-proof

**Certificate** 3034378

**Standards** FM Class 3600:1998, FM Class 3610:2010, FM Class 3810:2005, NEMA-250:1997, IEC 60529:2004

**Markings** NI CL I, DIV 2, GP A, B, C, D; T4( $-50\text{ °C} \leq T_a \leq +70\text{ °C}$ ); DIP CL II/III DIV 1, GP E, F, G; T5( $-50\text{ °C} \leq T_a \leq +85\text{ °C}$ ); when installed per Rosemount drawing 00849-1000; Type 4X; IP66

## Canada

### I6 Canada Intinsic Safety

**Certificate** 1261865

**Standards** CSA Std. C22.2 No. 25-1966, CSA Std. C22.2 No. 30-M1986, CAN/CSA C22.2 No. 94-M91, CSA C22.2 No. 142-M1987, CAN/CSA C22.2 No. 157-92, CSA Std. C22.2 No. 213-M1987, CSA Std. C22.2 No 60529:05

**Markings** Intrinsically Safe for CL I, DIV 1 GP A, B, C, D; Suitable for CL I DIV 2 GP A, B, C, D; when installed per Rosemount drawing 00849-1016; T3C; Type 4X, IP66

See [Table](#) at the end of the Product Certifications section for entity parameters.

### N6 Canada Class I, Division 2

**Certificate** 1261865

**Standards** CSA Std. C22.2 No. 25-1966, CSA Std. C22.2 No. 30-M1986, CAN/CSA C22.2 No. 94-M91, CSA C22.2 No. 142-M1987, CSA Std. C22.2 No. 213-M1987, CSA Std. C22.2 No 60529:05


**Markings** Suitable for CL I DIV 2 GP A, B, C, D; T3C; when installed per Rosemount drawing 00849-1016; Type 4X, IP66

## Europe

### I1 ATEX Intrinsic Safety

**Certificate** Baseefa09ATEX0022X

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

**Markings**  II 1 G Ex ia IIC T4/T5 Ga T4( $-60\text{ °C} \leq T_a \leq +70\text{ °C}$ ), T5( $-60\text{ °C} \leq T_a \leq +40\text{ °C}$ )

See [Table](#) at the end of the Product Certifications section for entity parameters.

#### Special Conditions for Safe Use (X):

1. The surface resistivity of the antenna is greater than 1 GΩ. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.
2. The Model 701PBKPF Power Module or Intelligent Power Module 71008 may be replaced in a hazardous area. The Power Modules have surface resistivity greater than 1 GΩ and must be properly installed in the wireless device enclosure. Care must be taken during transportation to and from the point of installation to prevent electrostatic charge build-up.
3. The enclosure may be made from aluminum alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion when located in a zone 0 area.

## International

### I7 IECEx Intrinsic Safety

<b>Certificate</b>	IECEX BAS 09.0004X
<b>Standards</b>	IEC 60079-0:2011, IEC 60079-11:2011
<b>Markings</b>	Ex ia IIC T5/T4 Ga, T4(-60 °C ≤ T <sub>a</sub> ≤ +70 °C), T5(-60 °C ≤ T <sub>a</sub> ≤ +40 °C)

See [Table](#) at the end of the Product Certifications section for entity parameters.

#### Special Conditions for Safe Use (X):

1. The surface resistivity of the antenna is greater than 1 GΩ. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.
2. The Model 701PBKCF Power Module or Intelligent Power Module 71008 may be replaced in a hazardous area. The Power Modules have surface resistivity greater than 1 GΩ and must be properly installed in the wireless device enclosure. Care must be taken during transportation to and from the point of installation to prevent electrostatic charge build-up.
3. The enclosure may be made from aluminum alloy with a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion when located in Zone 0.

## Brazil

### I2 Brazil Intrinsic Safety

<b>Certificate</b>	UL-BR 15.0034X
<b>Standards</b>	ABNT NBR IEC 60079-0:2013, ABNT NBR IEC 60079-11:2013
<b>Markings</b>	Ex ia IIC T4/T5, T4(-60 °C ≤ T <sub>a</sub> ≤ +70 °C), T5(-60 °C ≤ T <sub>a</sub> ≤ +40 °C)

See [Table](#) at the end of the Product Certifications section for entity parameters.

#### Special Condition for Safe Use (X):

1. The surface resistance of the antenna is greater than 1 GΩ. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.
2. The Model 701PBKCF Power Module, MHM-89004 Blue Power Module or Intelligent Power Module 71008 may be replaced in a hazardous area. The power module has surface resistance greater than 1 GΩ and must be properly installed in the wireless device enclosure. Care must be taken during transportation to and from the point of installation to prevent electrostatic charge build-up.
3. The 848T enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in areas that requires EPL Ga (Zone 0).

## China

### I3 China Intrinsic Safety

<b>Certificate</b>	GYJ21.1125X
<b>Markings</b>	Ex ia IIC T4/T5 Ga, T4(-60 °C ≤ T <sub>a</sub> ≤ +70 °C), T5(-60 °C ≤ T <sub>a</sub> ≤ +40 °C)

See [Table](#) at the end of the Product Certifications section for entity parameters.

**Special Condition for Safe Use (X):**

1. The surface resistance of the antenna is greater than 1 GΩ. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.
2. The power module may be replaced in a hazardous area. The power module has surface resistance greater than 1 GΩ and must be properly installed in the wireless device enclosure. Care must be taken during transportation to and from the point of installation to prevent electrostatic charge build-up.
3. Manufacture-provided battery pack made up of two Tadiran TL-5920 Lithium Thionyl-Chloride primary cells should be used.
4. 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.
5. The cables between this product and associated apparatus should be shielded cables (the cables must have insulated shield). The shield has to be grounded reliably in non-hazardous area.
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 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)” GB3836.18-2010 “Explosive Atmospheres Part 18: Intrinsically Safe System GB50257-2014 “Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering”

## EAC - Belarus, Kazakhstan, Russia

### IM Technical Regulations Customs Union (EAC) Intrinsic Safety

**Markings**      0Ex ia IIC T4, T5 Ga X, T4(-60 °C ≤ T<sub>a</sub> ≤ +70 °C), T5(-60 °C ≤ T<sub>a</sub> ≤ +40 °C); IP66/IP67

See [Table](#) at the end of the Product Certifications section for entity parameters.

## Japan

### I4 Japan Intrinsic Safety

**Certificate**                      CML 19JPN2037X

**Markings**                        Ex ia IIC T4/T5 Ga (-60/40°C ≤ T<sub>a</sub> ≤ +40/70°C)

See [Table](#) at the end of the Product Certifications section for entity parameters.

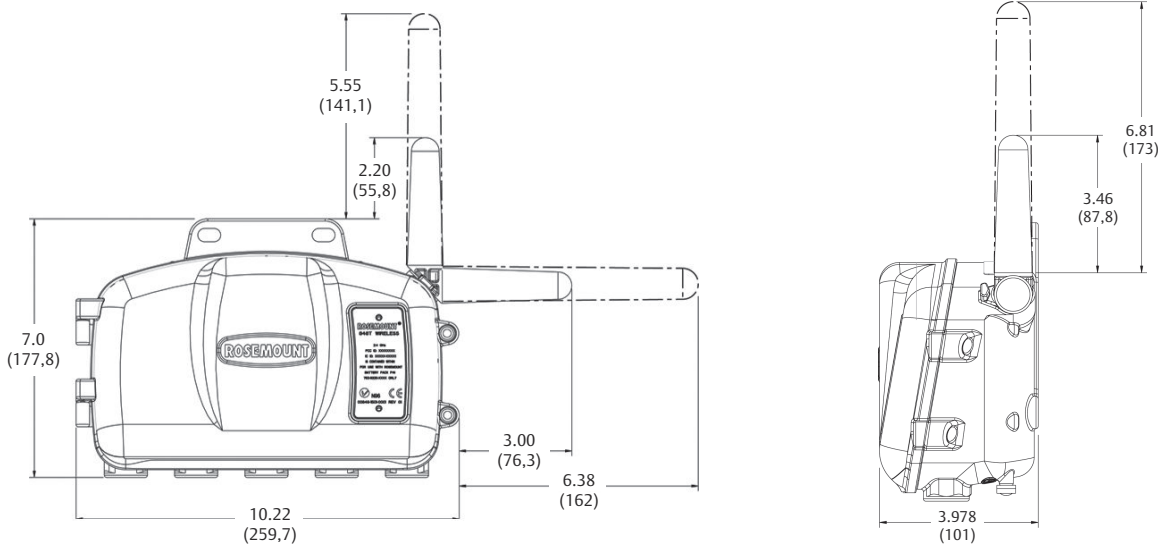
## Korea

### IP Korea Intrinsic Safety

**Certificate**                      10-KB4BO-0087X

**Markings**                        Ex ia IIC T5/T4, -60 °C ≤ T<sub>a</sub> ≤ +40 °C(T5)/+70 °C(T4)

# Dimensional drawings for Rosemount 848T Wireless



Dimensions are in inches (millimeters).





For more information: [www.emerson.com](http://www.emerson.com)

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