



HIGH ACCURACY

m e a s u r e m e n t i n s t r u m e n t s

PRODUCT DATASHEET

www.high-accuracy.com

Rosemount™ 848T High Density Temperature Measurement Family



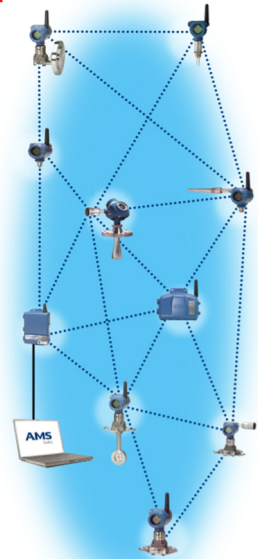
- Innovative temperature measurement for high density applications that provide installation and operational savings.
- Independently configurable inputs that support RTD, thermocouple, ohm, mV, 0–10 volt, and 4–20 mA signals.
- Enclosure options and intrinsically safe design allows for installation 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

Smart Wireless delivers innovative wireless solutions for temperature measurement

- 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



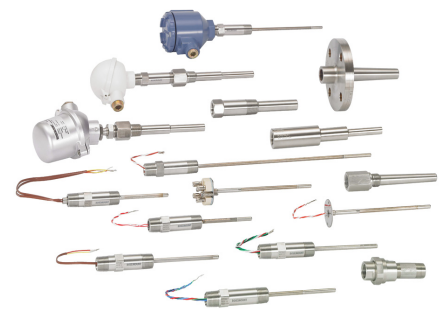
FOUNDATION™ Fieldbus provides effective measurements with reduced wiring costs

- 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.



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Experience global consistency and local support from 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.
- 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:

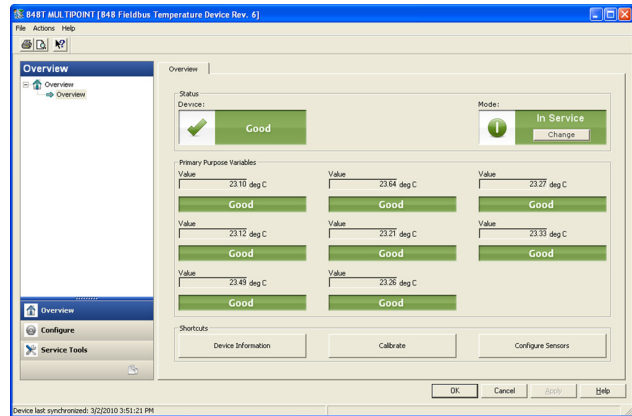
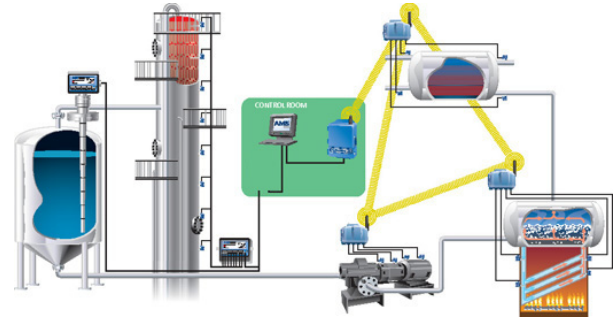
- Bearing temperature on pumps and motors
- Distillation columns
- Furnaces and boilers
- Reactors, storage tanks, and many more

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.



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, 2 MAI blocks, 4 ISEL Blocks, and backup LAS capabilities
- 600 Vdc isolation and integral transient protection

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See [page 28](#) for more information on material selection.

Table 1. Rosemount 848T FOUNDATION Fieldbus Ordering Table

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.

| Model | Product description | | |
|---|---|---|---|
| 848T | High Density Temperature Measurement Family | | |
| Transmitter output | | | |
| F | FOUNDATION Fieldbus digital signal (includes AI, MAI, and ISEL function blocks, and Backup Link Active Scheduler) | | ★ |
| Product certifications⁽¹⁾ | | 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 ⁽²⁾ | FM Intrinsically Safe | No | ★ |
| I6 ⁽²⁾ | 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 ⁽²⁾ | 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 | ★ |

Table 1. Rosemount 848T FOUNDATION Fieldbus Ordering Table

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.

| Product certifications ⁽¹⁾ | | Rosemount Junction Box required? | |
|---------------------------------------|--|----------------------------------|---|
| N5 | FM Class I, Division 2, and Dust Ignitionproof (enclosure required) | Yes | ★ |
| N6 | CSA Class I, Division 2 | No | ★ |
| N7 | IECEX Type n (enclosure required) | Yes | ★ |
| NC | ATEX Type n Component (Ex nA nL) | No ⁽³⁾ | ★ |
| ND | ATEX Dust (enclosure required) | Yes | ★ |
| NJ | IECEX Type n Component (Ex nA nL) | No ⁽³⁾ | ★ |
| NK | FM Class I, Division 2 | Yes | ★ |
| E6 | CSA Explosion-proof, Dust Ignitionproof, Division 2 (JX3 enclosure required) | Yes ⁽⁴⁾ | |
| IM | Technical Regulations Customs Union (EAC) Intrinsic Safety | No | ★ |
| IP | Korea Intrinsic Safety | No | ★ |
| NA | No approval | No | ★ |
| Input types | | | |
| S001 | RTD, thermocouple, mV, Ohm inputs | | ★ |
| S002 ⁽⁵⁾ | RTDs, thermocouple, mV, Ohm and 4–20 mA inputs | | ★ |

Options (Include with selected model number)

| Plantweb advanced diagnostics | | | |
|-------------------------------|---|--|---|
| D04 | Measurement validation diagnostic | | ★ |
| Transient protection | | | |
| T1 | Integral transient protector | | ★ |
| Mounting bracket | | | |
| B6 | Mounting bracket for 2-in. pipe mounting – SST bracket and bolts | | ★ |
| Enclosure options | | | |
| JP1 | Plastic junction box; no entries | | ★ |
| JP2 | Plastic box, cable glands (9 × M20 nickel-plated brass glands for 7.5–11.9 mm unarmored cable) | | ★ |
| JP3 | Plastic Box, conduit entries (five plugged holes, suitable for installing 1/2-in. NPT fittings) | | ★ |
| JA1 | Aluminum junction box; no entries | | ★ |
| 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 1/2-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 1/2-in. NPT fittings) | | ★ |
| JX3 ⁽⁶⁾ | Explosion-proof box, conduit entries (four plugged holes, suitable for installing 1/2-in. NPT fittings) | | ★ |
| Software configuration | | | |
| C1 | Custom configuration of date, descriptor, message and wireless parameters (requires CDS with order) | | ★ |
| Line filter | | | |
| F5 | 50 Hz line voltage filter | | ★ |

Table 1. Rosemount 848T FOUNDATION Fieldbus Ordering Table

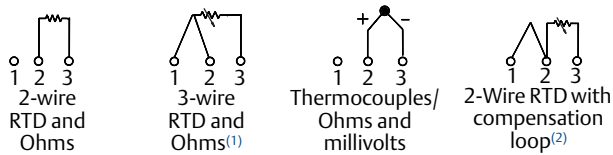
The starred offerings (★) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

| Calibration certificate | | |
|---|---|---|
| Q4 | Calibration certificate (3-point calibration) | ★ |
| Shipboard certification | | |
| 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 | | |
| LT | Test to -60 °F (-51.1 °C) | |
| Conduit electrical connector | | |
| GE ⁽⁷⁾ | M12, 4-pin, male connector (eurofast®) | ★ |
| GM ⁽⁷⁾ | A size mini, 4-pin, male connector (minifast®) | ★ |
| Extended product warranty | | |
| WR3 | 3-year limited warranty | ★ |
| WR5 | 5-year limited warranty | ★ |
| Typical model number: 848T F I5 S001 T1 B6 JA2 | | |

1. Consult factory for availability.
2. Available only with S001 option.
3. The Rosemount 848T ordered with component approval is not approved as a stand-alone unit. Additional system certification is required.
4. Enclosure Option JX3 must be ordered with Product Certification Code E6. (O-ring for the JX3 enclosure rated to -20 °C).
5. S002 is only available with Product Certification N5, N6, N1, NC, NK, and NA.
6. JX3 Explosion-proof enclosure rated to -4 °F (-20 °C).
7. Available with no approval or Intrinsically Safe approvals only. For FM Intrinsically Safe (option code I5), install in accordance with Rosemount drawing 00848-4402.

Wiring

Figure 1. 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 ⁽¹⁾ | Thermocouple Type J |
| Damping ⁽¹⁾ | Five seconds |
| Measurement units ⁽¹⁾ | °C |
| Output ⁽¹⁾ | Linear with temperature |
| Line voltage filter ⁽¹⁾ | 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 ⁽¹⁾ | Enabled |

1. For all eight sensors.

Specifications

Functional specifications

Inputs

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

Outputs

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

Status

If self-diagnostics detect a sensor burnout or a transmitter failure, the status of the measurement will be updated accordingly.

Ambient temperature limits

–40 to 185 °F (–40 to 85 °C)

Accuracy

(Pt 100 at reference condition: 20 °C) ± 0.30 °C (± 0.54 °F); for the complete list, see “Accuracy” on page 10.

Isolation

- 600 Vdc channel to channel isolation⁽¹⁾.
- 10 Vdc channel to channel isolation for all operating conditions with maximum 150 meters (500 feet) of sensor lead length 18 AWG.

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.

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 compliance testing

- Meets the criteria under European Union Directive 2004/108/EC.
- Meets the criteria under IEC 61326: 2006.

Stability

- $\pm 0.1\%$ of reading or 0.1 °C (0.18 °F), whichever is greater, for two years for RTDs.
- $\pm 0.1\%$ of reading or 0.1 °C (0.18 °F), 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.

1. Reference conditions are –40 to 60 °C (–40 to 140 °F) with 30 meters (100 feet) of sensor lead length 18 AWG wire.

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 Rosemount 848T 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. pipe stand (with option code B6).

Entries for optional junction box

No entry

- Used for custom fittings.

Cable gland

- 9 × M20 nickel-plated brass glands for 7.5–11.9 mm unarmored cable

Conduit

- Five plugged 0.86-in. diameter holes suitable for installing 1/2-in. NPT fittings.

Materials of construction for optional junction box

| Junction box type | Paint |
|--------------------------|-------------|
| Aluminum | Epoxy Resin |
| Plastic | N/A |
| Stainless Steel | N/A |
| Aluminum Explosion-proof | N/A |

Weight

| Assembly | Weight | | |
|--------------------------------|--------|------|------|
| | oz | lb | kg |
| Rosemount 848T only | 7.5 | .47 | .208 |
| Aluminum ⁽¹⁾ | 78.2 | 4.89 | 2.22 |
| Plastic ⁽¹⁾ | 58.1 | 3.68 | 1.65 |
| Stainless Steel ⁽¹⁾ | 77.0 | 4.81 | 2.18 |
| Aluminum Explosion-proof | 557 | 34.8 | 15.5 |

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. JX3 Explosion-proof enclosure rated to -4 °F (-20 °C).

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

Table 2. Input Options/Accuracy

| Sensor option | Sensor reference | Input ranges | | Accuracy over range(s) | |
|---|--------------------------------------|---------------------------|---------------------------|--------------------------|---------------------------|
| | | °C | °F | °C | °F |
| 2- and 3-wire RTDs | | | | | |
| Pt 50 ($\alpha = 0.00391$) | GOST 6651-94 | -200 to 550 | -328 to 1022 | ± 0.57 | ± 1.03 |
| Pt 100 ($\alpha = 0.00391$) | GOST 6651-94 | -200 to 550 | -328 to 1022 | ± 0.28 | ± 0.50 |
| Pt 100 ($\alpha = 0.00385$) | IEC 751; $\alpha = 0.00385$, 1995 | -200 to 850 | -328 to 1562 | ± 0.30 | ± 0.54 |
| Pt 100 ($\alpha = 0.003916$) | JIS 1604, 1981 | -200 to 645 | -328 to 1193 | ± 0.30 | ± 0.54 |
| Pt 200 ($\alpha = 0.00385$) | IEC 751; $\alpha = 0.00385$, 1995 | -200 to 850 | -328 to 1562 | ± 0.54 | ± 0.98 |
| Pt 200 ($\alpha = 0.003916$) | JIS 1604; $\alpha = 0.003916$, 1981 | -200 to 645 | -328 to 1193 | ± 0.54 | ± 0.98 |
| Pt 500 | IEC 751; $\alpha = 0.00385$, 1995 | -200 to 850 | -328 to 1562 | ± 0.38 | ± 0.68 |
| Pt 1000 | IEC 751; $\alpha = 0.00385$, 1995 | -200 to 300 | -328 to 572 | ± 0.40 | ± 0.72 |
| Ni 120 | Edison curve no. 7 | -70 to 300 | -94 to 572 | ± 0.30 | ± 0.54 |
| Cu 10 | Edison copper winding no. 15 | -50 to 250 | -58 to 482 | ± 3.20 | ± 5.76 |
| Cu 100 (a=428) | GOST 6651-94 | -185 to 200 | -301 to 392 | ± 0.48 | ± 0.86 |
| Cu 50 (a=428) | GOST 6651-94 | -185 to 200 | -301 to 392 | ± 0.96 | ± 1.73 |
| Cu 100 (a=426) | GOST 6651-94 | -50 to 200 | -58 to 392 | ± 0.48 | ± 0.86 |
| Cu 50 (a=426) | GOST 6651-94 | -50 to 200 | -58 to 392 | ± 0.96 | ± 1.73 |
| Thermocouples—cold junction adds + 0.5 °C to listed accuracy | | | | | |
| 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) ⁽¹⁾ | | 4–20 mA | | ± 0.01 mA | |
| 4–20 mA (NAMUR) ⁽¹⁾ | | 4–20 mA | | ± 0.01 mA | |

1. Requires the S002 option code.

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 4–20mA

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 [Table 3](#).

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 and 85 °C (–40 and 185 °F).

Table 4. Ambient Temperature Effects

| NIST type | Accuracy per 1.0 °C (1.8 °F) change in ambient temperature ⁽¹⁾⁽²⁾ | Temperature range (°C) |
|--|---|---|
| RTD | | |
| Pt 50 ($\alpha = 0.00391$) | 0.004 °C (0.0072 °F) | N/A |
| Pt 100 ($\alpha = 0.00391$) | 0.002 °C (0.0036 °F) | N/A |
| Pt 100 ($\alpha = 0.00385$) | 0.003 °C (0.0054 °F) | N/A |
| Pt 100 ($\alpha = 0.003916$) | 0.003 °C (0.0054 °F) | N/A |
| Pt 200 ($\alpha = 0.003916$) | 0.004 °C (0.0072 °F) | N/A |
| Pt 200 ($\alpha = 0.00385$) | 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 |
| Thermocouple (R = the value of the reading) | | |
| 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 |
| 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 (20 °C [68 °F] 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 2.4

European Directive Information

A copy of the EU Declaration of Conformity can be found at the end of the Quick Start Guide. The most recent revision of the EU Declaration of Conformity can be found at Emerson.com/Rosemount.

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** FM 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 °C ≤ T_a ≤ +60 °C); NI CL I, DIV 2, GP A, B, C, D; T4A(-50 °C ≤ T_a ≤ +85 °C); T5(-50 °C ≤ T_a ≤ +70 °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** FM 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 °C ≤ T_a ≤ +60 °C); NI CL I, DIV 2, GP A, B, C, D; T4A(-50 °C ≤ T_a ≤ +85 °C); T5(-50 °C ≤ T_a ≤ +70 °C) when installed per Rosemount drawing 00848-4404
- N5** 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 °C ≤ T_a ≤ +85 °C); T5(-50 °C ≤ T_a ≤ +70 °C) when installed per Rosemount drawing 00848-4404; Type 4X
- NK** 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 °C ≤ T_a ≤ +85 °C); T5(-50 °C ≤ T_a ≤ +70 °C) when installed per Rosemount drawing 00848-4404

Note

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

Table 5. Entity Parameters

| FIELD BUS (input) | FISCO (input) | Nonincendive (input) | Sensor field terminal (output) |
|---------------------------|---------------------------|-------------------------|--------------------------------|
| V _{MAX} = 30 V | V _{MAX} = 17.5 | V _{MAX} = 42.4 | V _{OC} = 12.5 V |
| I _{MAX} = 300 mA | I _{MAX} = 380 mA | C _i = 2.1 nF | I _{SC} = 4.8 mA |
| P _i = 1.3 W | P _i = 5.32 W | L _i = 0 | P _o = 15 mW |
| C _i = 2.1 nF | C _i = 2.1 nF | N/A | C _A = 1.2 μF |
| L _i = 0 | L _i = 0 | N/A | L _A = 1 H |

Canada

- E6** CSA 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 °C ≤ T_a ≤ +40 °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 °C ≤ T_a ≤ +60 °C) when installed per Rosemount drawing 00848-4405; Conduit Seal Required

- I6** CSA 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 °C ≤ T_a ≤ +60 °C) when installed per Rosemount drawing 00848-4405; Class I, Division 2, Groups A, B, C, D; T3C(-50 °C ≤ T_a ≤ +60 °C) when installed per Rosemount drawing 00848-4405

- IF** CSA 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 °C ≤ T_a ≤ +60 °C) when installed per Rosemount drawing 00848-4405; Class I, Division 2, Groups A, B, C, D; T3C(-50 °C ≤ T_a ≤ +60 °C) when installed per Rosemount drawing 00848-4405

- N6** CSA 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_a ≤ +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 60079-0:2012, EN60079-11:2012
 Markings: Ⓜ II 1 G Ex ia IIC T4 Ga (-50 °C ≤ T_a ≤ +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 500V insulation test required by EN 60079-11:2011, clause 6.3.13. This must be taken into account when installing the equipment.

Table 6. Entity Parameters

| Fieldbus (input) | Sensor field terminal (output) |
|-------------------------|--------------------------------|
| U _i = 30 V | U _o = 12.5 V |
| I _i = 300 mA | I _o = 4.8 mA |
| P _i = 1.3 W | P _o = 15 mW |
| C _i = 2.1 nF | C _o = 1.2 μF |
| L _i = 0 | L _o = 1 H |

- IA** ATEX FISCO Intrinsic Safety
 Certificate: Baseefa09ATEX0093X
 Standards: EN 60079-0:2012, EN60079-11:2012
 Markings: Ⓜ II 1 G Ex ia IIC T4 Ga (-50 °C ≤ T_a ≤ +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.

Table 7. Entity Parameters

| FISCO (input) | Sensor field terminal (output) |
|-----------------------|--------------------------------|
| $U_i = 17.5\text{ V}$ | $U_o = 12.5\text{ V}$ |
| $I_i = 380\text{ mA}$ | $I_o = 4.8\text{ mA}$ |
| $P_i = 5.32\text{ W}$ | $P_o = 15\text{ mW}$ |
| $C_i = 2.1\text{ nF}$ | $C_o = 1.2\text{ }\mu\text{F}$ |
| $L_i = 0$ | $L_o = 1\text{ H}$ |

N1 ATEX Type n (with enclosure)
 Certificate: Baseefa09ATEX0095X
 Standards: EN 60079-0:2006, EN60079-15:2005
 Markings: II 3 G Ex nA nL IIC T5(-40 °C ≤ T_a ≤ +65 °C)

Special Conditions for Safe Use (X):

1. 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%.
2. The electrical circuit is connected directly to earth; this must be taken into account when installing the apparatus.

NC ATEX Type n (without enclosure)
 Certificate: Baseefa09ATEX0094U
 Standards: EN 60079-0:2006, EN60079-15:2005
 Markings: II 3 G Ex nA nL IIC T4(-50 °C ≤ T_a ≤ +85 °C), T5(-50 °C ≤ T_a ≤ +70 °C)

Schedule of Limitations (U):

1. The component must be installed in a suitable component certified enclosure that provides a degree of protection of at least IP54 and meets the relevant material and environmental requirements of EN 60079-0:2006 and EN 60079-15:2005.
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%.
3. The electrical circuit is connected directly to earth; this must be taken into account when installing the apparatus.

Note

The Rosemount 848T may also be installed in an external energy limited circuit as Ex nL IIC. In this case the following parameters apply:

Table 8. Entity Parameters

| Power/bus (input) | Sensor field terminal (output) |
|-----------------------|---------------------------------|
| $U_i = 42.4\text{ V}$ | $U_o = 12.5\text{ V}$ |
| $C_i = 2.1\text{ nF}$ | $I_o = 2.5\text{ mA}$ |
| $L_i = 0$ | $C_o = 1000\text{ }\mu\text{F}$ |
| N/A | $L_o = 1\text{ H}$ |

ND ATEX Dust
 Certificate: BAS01ATEX1315X
 Standards: EN 50281-1-1:1998
 Markings: II 1 D T90 °C (-40 °C ≤ T_a ≤ +65 °C); IP66

Special Conditions for Safe Use (X):

1. The user must ensure that the maximum rated voltage and current (42.4 volts, 22 milliamps DC) are not exceeded. All connections to other apparatus or associated apparatus shall have control over this voltage and current equivalent to a category “ib” circuit according to EN 50020.
2. Component approved EEx e cable entries must be used which maintain the ingress protection of the enclosure to at least IP66.
3. Any unused cable entry holes must be filled with component approved EEx e blanking plugs.
4. The ambient temperature range of use shall be the most restrictive of the apparatus, cable gland or blanking plug.

International

I7 IECEx Intrinsic Safety
 Certificate: IECEx BAS 09.0030X
 Standards: IEC 60079-0:2011, IEC60079-11:2011
 Markings: Ex ia IIC T4 Ga (-50 °C ≤ T_a ≤ +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
 Certificate: IECEx BAS 09.0030X
 Standards: IEC 60079-0:2011, IEC60079-11:2011
 Markings: Ex ia IIC T4 Ga (-50 °C ≤ T_a ≤ +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.

Table 9. Entity Parameters

| FISCO (input) | Sensor field terminal (output) |
|-----------------------|--------------------------------|
| $U_i = 17.5\text{ V}$ | $U_o = 12.5\text{ V}$ |
| $I_i = 380\text{ mA}$ | $I_o = 4.8\text{ mA}$ |
| $P_i = 5.32\text{ W}$ | $P_o = 15\text{ mW}$ |
| $C_i = 2.1\text{ nF}$ | $C_o = 1.2\text{ }\mu\text{F}$ |
| $L_i = 0$ | $L_o = 1\text{ H}$ |

N7 IECEx Type n (with enclosure)
 Certificate: IECEx BAS 09.0032X
 Standards: IEC 60079-0:2004, IEC 60079-15:2005
 Markings: Ex nA nL IIC T5(-40 °C ≤ T_a ≤ +65 °C)

Special Conditions for Safe Use (X):

1. 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%.
2. The electrical circuit is connected directly to earth; this must be taken into account when installing the apparatus.

NJ IECEx Type n (without enclosure)
 Certificate: IECEx BAS 09.0031U
 Standards: IEC 60079-0:2004, IEC 60079-15:2005
 Markings: Ex nA nL IIC T4(-50 °C ≤ T_a ≤ +85 °C),
 T5(-50 °C ≤ T_a ≤ +70 °C)

Schedule of Limitations (U):

1. The component must be installed in a suitable component certified enclosure that provides a degree of protection of at least IP54 and meets the relevant material and environmental requirements of EN 60079-0:2006 and EN 60079-15:2005.
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%.
3. The electrical circuit is connected directly to earth; this must be taken into account when installing the apparatus.

Brazil

I2 INMETRO Intrinsic Safety
 Certificate: UL-BR 16.0086X
 Standards: ABNT NBRIEC 60079-0:2008+Errata 1:2011
 ABNT NBR IEC 60079-11:2009
 Markings: Ex ia IIC T4(-50 °C ≤ T_a ≤ +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.

Table 10. Entity Parameters

| Fieldbus (input) | Sensor field terminal (output) |
|-----------------------|--------------------------------|
| $U_i = 30\text{ V}$ | $U_o = 12.5\text{ V}$ |
| $I_i = 300\text{ mA}$ | $I_o = 4.8\text{ mA}$ |
| $P_i = 1.3\text{ W}$ | $P_o = 15\text{ mW}$ |
| $C_i = 2.1\text{ nF}$ | $C_o = 1.2\text{ }\mu\text{F}$ |
| $L_i = 0$ | $L_o = 1\text{ H}$ |

IB INMETRO Intrinsic Safety
 Certificate: UL-BR 16.0086X
 Standards: ABNT NBRIEC 60079-0:2008+Errata 1:2011
 ABNT NBR IEC 60079-11:2009
 Markings: Ex ia IIC T4(-50 °C ≤ T_a ≤ +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.

Table 11. Entity Parameters

| FISCO (input) | Sensor field terminal (output) |
|-----------------------|--------------------------------|
| $U_i = 17.5\text{ V}$ | $U_o = 12.5\text{ V}$ |
| $I_i = 380\text{ mA}$ | $I_o = 4.8\text{ mA}$ |
| $P_i = 5.32\text{ W}$ | $P_o = 15\text{ mW}$ |
| $C_i = 2.1\text{ nF}$ | $C_o = 1.2\text{ }\mu\text{F}$ |
| $L_i = 0$ | $L_o = 1\text{ H}$ |

China

- I3** NEPSI Intrinsic Safety
 Certificate: GYJ16.1205X
 Standards: GB3836.1-2010, GB3836.4-2010,
 GB3836.20-2010
 Markings: Ex ia IIC T4/T5 Ga

Special Conditions for Safe Use (X):

1. Only when temperature transmitter is installed in IP 20(GB4208-2008) housing, can it be used in a hazardous location. Metallic housing should observe the requirements of GB3836.1-2010 Clause 8. Non-metallic housing should observe the requirements of GB3836.1-2010 Clause 7.3.
2. This apparatus is not capable of withstanding the 500 V rms insulation test required by Clause 6.4.12 of GB3836.4-2010.
3. The ambient temperature range of the equipment is $T_4(-50\text{ }^\circ\text{C} \leq T_a \leq +60\text{ }^\circ\text{C})$.
4. Parameters:

| Terminals of power/loop (1-2) | | | | | |
|-------------------------------|-------------------------|-------------------------|-----------------------|------------------------------|----------|
| Output | Maximum output voltage: | Maximum output current: | Maximum output power: | Maximum external parameters: | |
| | $U_o(V)$ | $I_o(mA)$ | $P_o(mW)$ | $C_o(\mu F)$ | $L_o(H)$ |
| F | 30 | 300 | 1.3 | 2.1 | 0 |
| F (FISCO) | 17.5 | 380 | 5.32 | 2.1 | 0 |

Note

Non-FISCO parameters listed above must be derived from a linear supply with a resistance limited output.

| Terminals of sensor | | | | | | |
|---------------------|-----------|-------------------------|-------------------------|-----------------------|------------------------------|----------|
| Output | Terminals | Maximum output voltage: | Maximum output current: | Maximum output power: | Maximum external parameters: | |
| | | $U_o(V)$ | $I_o(mA)$ | $P_o(mW)$ | $C_o(\mu F)$ | $L_o(H)$ |
| F | 1-8 | 30 | 300 | 1.3 | 2.1 | 0 |

5. The product complies to the requirements for FISCO field devices specified in IEC60079-27: 2008. For the connection of an intrinsically safe circuit in accordance FISCO model, FISCO parameters of this product are as above.
6. 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.
7. The cables between this product and associated apparatus should be shielded cables (the cables must have insulated shield). The shielded cable has to be grounded reliably in non-hazardous area.

8. End users are not permitted to change any component's insides, but to settle the problem, in conjunction with manufacturer to avoid damage to the product.
9. During 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"

- N3** NEPSI Type n
 Certificate: GYJ17.1008U
 Standards: GB3836.1-2010, GB3836.8-2014
 Markings: Ex nA nL IIC T4/T5 Gc

Schedule of Limitations (U):

1. This component is not capable of withstanding the 500 V electrical strength test defined in Clause 6.5.1 of GB3836.8-2014. The must be taken into account during installation.
2. This component must be housed in a suitable component certified enclosure that provides a degree of protection of at least IP54 and meets the relevant material and environmental requirements of GB3836.1-2010 and GB3836.8-2014.
3. 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 the 40%.
4. The ambient temperature range is:

| T code | Ambient temperature |
|--------|---|
| T4 | $-50\text{ }^\circ\text{C} \leq T_a \leq +85\text{ }^\circ\text{C}$ |
| T5 | $-50\text{ }^\circ\text{C} \leq T_a \leq +70\text{ }^\circ\text{C}$ |

5. Maximum input voltage: 42.4 V.
6. End users are not permitted to change any components inside, but to settle the problem in conjunction with manufacturer to avoid damage to the product.
7. During installation, use and maintenance of this product, observe the following standards:
 GB3836.13-2013 "Electrical apparatus for explosive gas atmospheres Part 13: Repair and overhaul for apparatus used in explosive gas atmospheres"
 GB3836.15-2000 "Electrical apparatus for explosive gas atmospheres Part 15: Electrical installations in hazardous area (other than mines)"

GB3836.16-2006 “Electrical apparatus for explosive gas atmospheres Part 16: Inspection and maintenance of electrical installation (other than mines)”
 GB50257-2014 “Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering”

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

Japan

I4 TIIS FISCO Intrinsic Safety (ia)
 Certificate: TC19713
 Markings: ia IIC T4

TIIS Wi-HART Intrinsic Safety (ia)
 Certificate: TC19154
 Markings: ia IIC T4

H4 TIIS FISCO Intrinsic Safety (ib)
 Certificate: TC20737
 Markings: ia IIC T4

Korea

IP Korea Intrinsic Safety
 Certificate: 10-KB4BO-0088X
 Markings: Ex ia IIC T4 (-50 °C ≤ T_a ≤ +60 °C)

EAC - Belarus, Kazakhstan, Russia

IM Technical Regulation Customs Union (EAC) Intrinsic Safety
 Standards: GOST R IEC 60079-0-2011,
 GOST R IEC 60079-11-2010
 Markings: [FOUNDATION Fieldbus]: 0Ex ia IIC T4 Ga X


Special Condition for Safe Use (X):

1. 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. G¹/₂ and PG 13.5 thread forms are only acceptable for existing (legacy) equipment installations.

IECEx Flameproof and Increased Safety

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. G¹/₂ and PG 13.5 thread forms are only acceptable for existing (legacy) equipment installations.

Table 12. Conduit Plug Thread Sizes

| Thread | Identification mark |
|-------------------------------|-------------------------------|
| M20 × 1.5 | M20 |
| 1/2 - 14 NPT | 1/2 NPT |
| G ¹ / ₂ | G ¹ / ₂ |

Table 13. Thread Adapter Thread Sizes

| Male thread | Identification mark |
|----------------|---------------------|
| M20 × 1.5 – 6H | M20 |
| 1/2 – 14 NPT | 1/2 – 14 NPT |
| 3/4 – 14 NPT | 3/4 – 14 NPT |
| Female thread | Identification mark |
| M20 × 1.5 – 6H | M20 |
| 1/2 – 14 NPT | 1/2 – 14 NPT |
| PG 13.5 | PG 13.5 |

Additional Certifications

SBS American Bureau of Shipping (ABS) Type Approval
 Certificate: 011-HS771994C-1-PDA
 ABS Rules: 2013 Steel Vessels Rules 1-1-4/7.7,
 1-1-Appendix 3, 4-8-3/1.7, 4-8-3/13.1

SBV Bureau Veritas (BV) Type Approval
 Certificate: 26325/A3 BV
 Requirements: Bureau Veritas Rules for the Classification of
 Steel Ships
 Application: Class notations: AUT-UMS, AUT-CCS,
 AUT-PORT and AUT-IMS

SDN Det Norske Veritas (DNV) Type Approval
 Certificate: A-14187
 Intended Use: Det Norske Veritas' Rules for Classification of
 Ships, High Speed & Light Craft and Det
 Norske Veritas' Offshore Standards

Application:

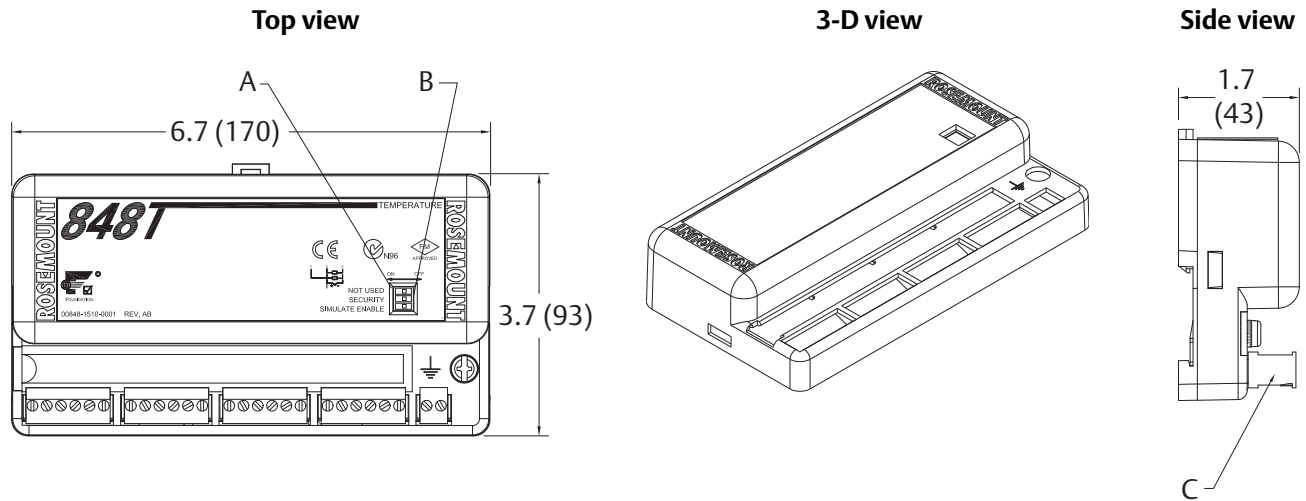
| Location classes | |
|------------------|---------------------------|
| Temperature | D |
| Humidity | B |
| Vibration | A |
| EMC | A |
| Enclosure | B/IP66: AI C/IP66: SST |

SLL Lloyds Register (LR) Type Approval
 Certificate: 11/60002 (E2)
 Application: Environmental categories ENV1, ENV2, ENV2
 and ENV5

Dimensional Drawings

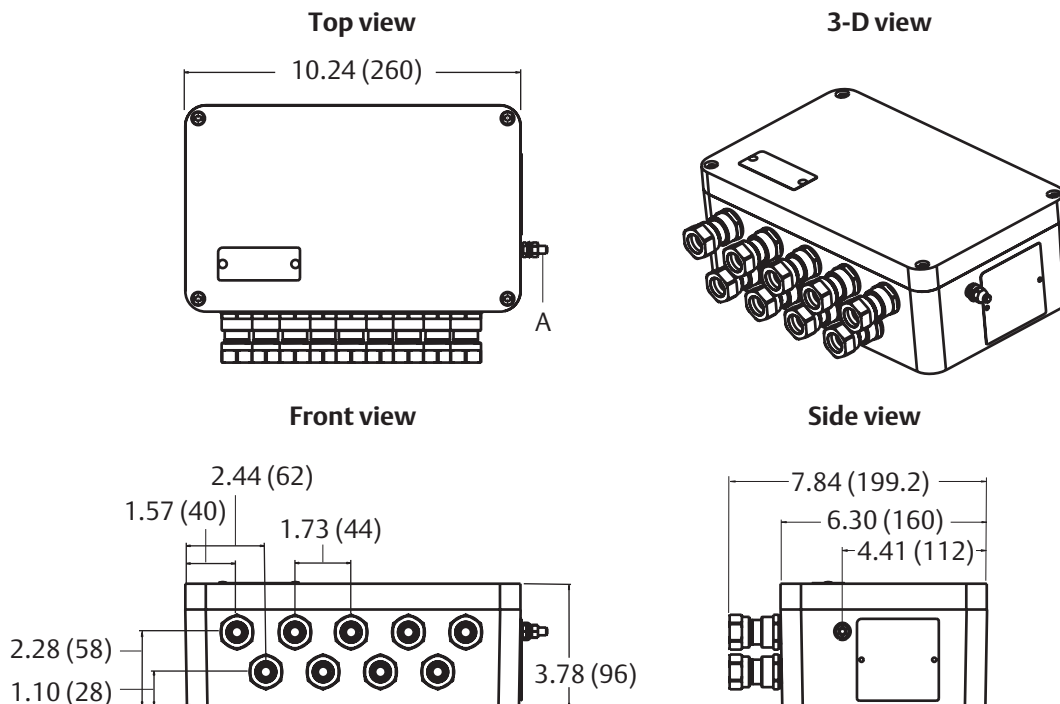
Junction boxes with no entries (option codes JP1, JA1, and JS1) – external dimensions are the same as those outlined for the other junction box materials in this section.

Figure 2. Rosemount 848T



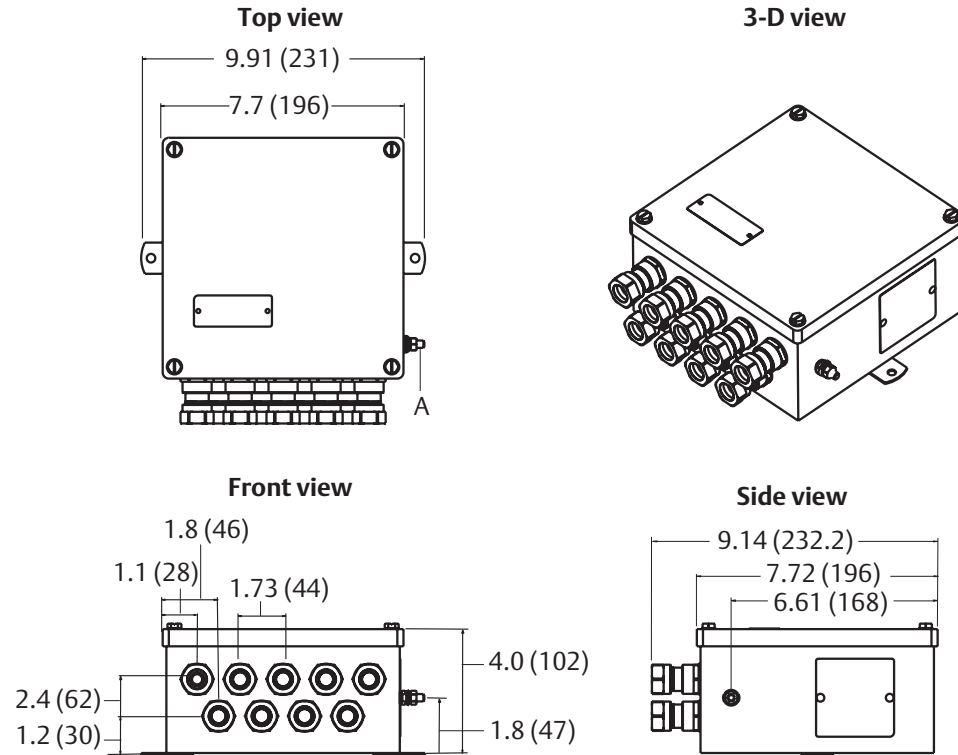
- A. Security switch
 - B. Simulation switch
 - C. Removable wiring connection
- Dimensions are in inches (millimeters).

Figure 3. Aluminum/Plastic Junction Box—Cable Gland (Option Codes JA2 and JP2)



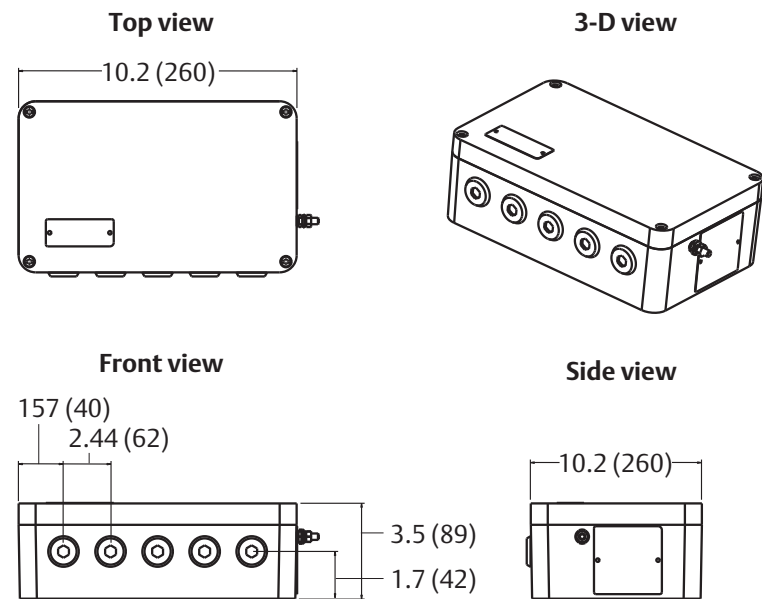
- A. Ground screw
- Dimensions are in inches (millimeters).

Figure 4. Stainless Steel Junction Box—Cable Gland (Option Code JS2)



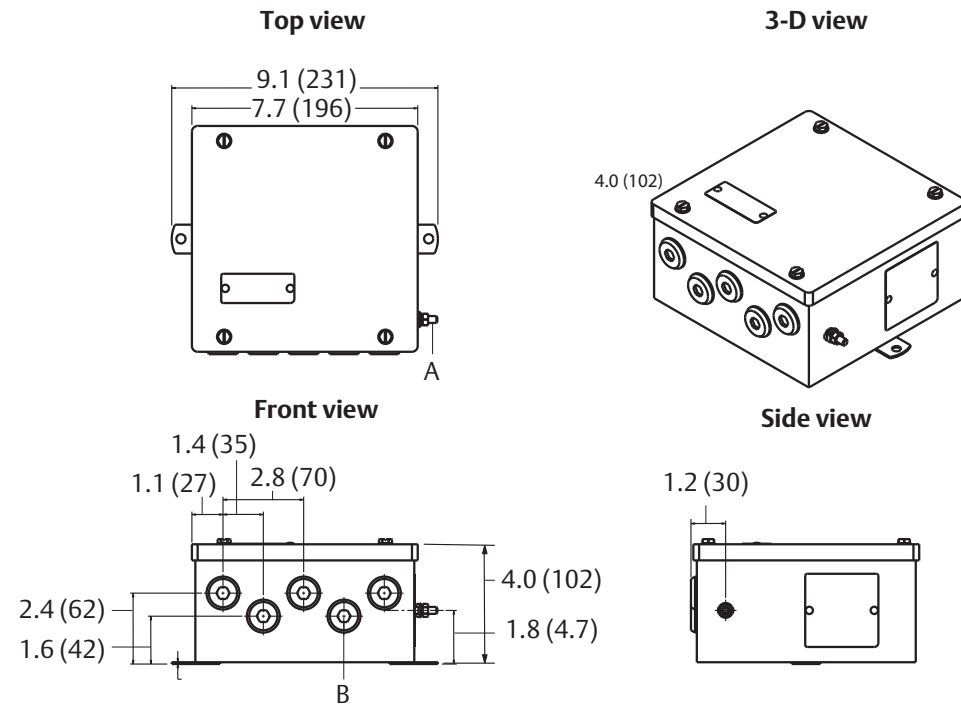
A. Ground screw
 Dimensions are in inches (millimeters).

Figure 5. Aluminum/Plastic Junction Box—Conduit Entry (Option Codes JA3 and JP3)



A. Five plugged 0.86-in. diameter holes suitable for installing 1/2-in. NPT fittings
 Dimensions are in inches (millimeters).

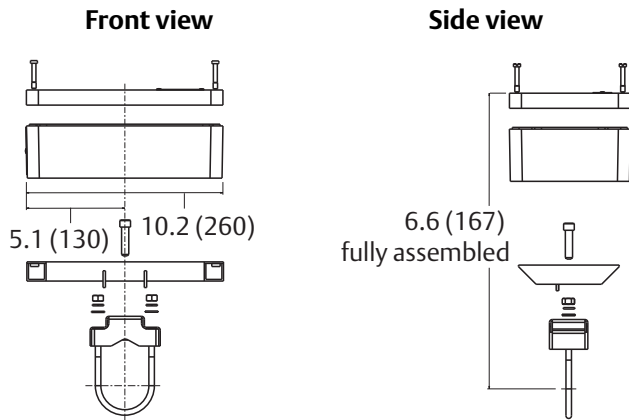
Figure 6. Stainless Steel Junction Box—Conduit Entry (Option Code JS3)



A. Ground screw
 B. Five Plugged 0.86-in. diameter holes suitable for installing 1/2-in. NPT fittings
 Dimensions are in inches (millimeters).

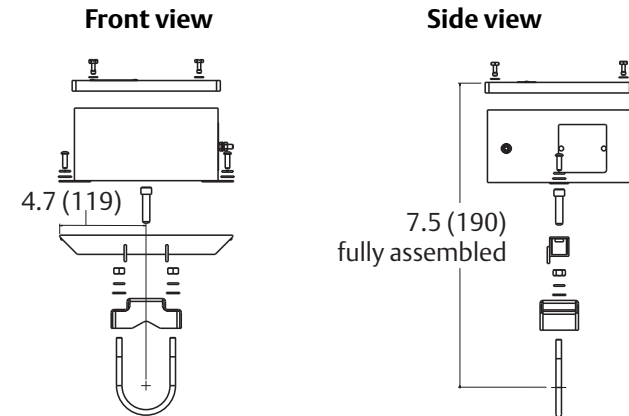
Mounting options

Figure 7. Aluminum/Plastic Junction Box (Styles JA and JP)



Dimensions are in inches (millimeters).

Figure 8. Stainless Steel Junction Box (Style JS)

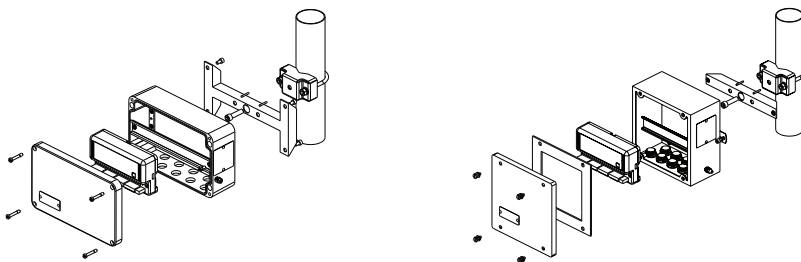


Dimensions are in inches (millimeters).

Figure 9. Mounted on Vertical Pipe

Aluminum/plastic junction box

Stainless steel junction box



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*. 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, 0-1000mV and 0-10V, 2-, 3- and 4-wire ohms, and 4-20 mA signals.

- Intrinsically safe, long lasting power module, which utilizes Emerson's SmartPower Technology
- Configurable high and low alerts to improve process performance
- Easy to use Device Dashboard, used to configure, monitor, and troubleshoot the Rosemount 848T

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment.

See [page 28](#) for more information on Material Selection.

Table 14. Rosemount 848T Wireless Transmitter Ordering Table

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.

| Model | Product description | |
|-------------------------------|--|---|
| 848T | High density temperature measurement family | |
| Transmitter output | | |
| X | Wireless | ★ |
| Product certifications | | |
| 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 | ★ |
| Input type | | |
| S001 | RTD, thermocouple, mV, Ohm Inputs | ★ |
| S002 ⁽¹⁾ | RTD, thermocouple, mV, Ohm and 4–20 mA inputs | ★ |
| S003 | RTD, thermocouple, Ohm, mV, and 2 - dual channel voltage adapters | ★ |
| S004 ⁽²⁾ | RTD, thermocouple, Ohm, mV, and 1 - dual channel voltage adapters | ★ |

Table 14. Rosemount 848T Wireless Transmitter Ordering Table

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.

Options (include with selected model number)

| Wireless burst rate, operating frequency and protocol⁽³⁾ | | |
|--|---|---|
| WA3 | User configurable update rate, 2.4 GHz DSSS, IEC 62591 (<i>WirelessHART</i>) | ★ |
| Omni-directional wireless antenna and SmartPower⁽⁴⁾ | | |
| WK1 | External antenna, adapter for black power module (I.S. power module sold separately) ⁽⁵⁾ | ★ |
| WM1 | Extended range, external antenna, adapter for black power module (I.S. power module sold separately) ⁽⁵⁾ | ★ |
| Mounting bracket | | |
| B6 | Mounting bracket for 2-in. pipe mounting - SST bracket and bolts | ★ |
| Enclosure options⁽⁶⁾ | | |
| HA1 | Aluminum with cable glands (5 × 1/2-in. NPT for 7.5 - 11.9 mm) | ★ |
| HA2 | Aluminum with conduit entries (5 plugged holes, suitable for installing 1/2-in. NPT fittings) | ★ |
| Software configuration | | |
| C1 | Custom configuration of date, descriptor, message and wireless parameters (required CDS with order) | ★ |
| Line filter | | |
| F5 | 50 Hz line voltage filter | ★ |
| 5-point calibration | | |
| C4 | 5-point calibration (requires Q4 option code to generate a calibration certificate) | |
| Calibration certificate | | |
| Q4 | Calibration certificate (3-point calibration) | ★ |
| Shipboard certification | | |
| SBV | Bureau Veritas (BV) type approval | ★ |
| Extended product warranty | | |
| WR3 | 3-year limited warranty | ★ |
| WR5 | 5-year limited warranty | ★ |
| Typical model number: 848T X I5 S001 WA3 WK1 B6 HA1 | | |

1. Only available with product certifications NA and N5. Stable resistors included.
2. Dual channel voltage adapter will be installed on channels 1 and 2.
3. Required for wireless.
4. WK1 or WM1 required for wireless.
5. Black power module must be shipped separately, order Model 701PBKKF or Part# 00753-9220-0001.
6. HA1 or HA2 required for wireless.

WirelessHART... the 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

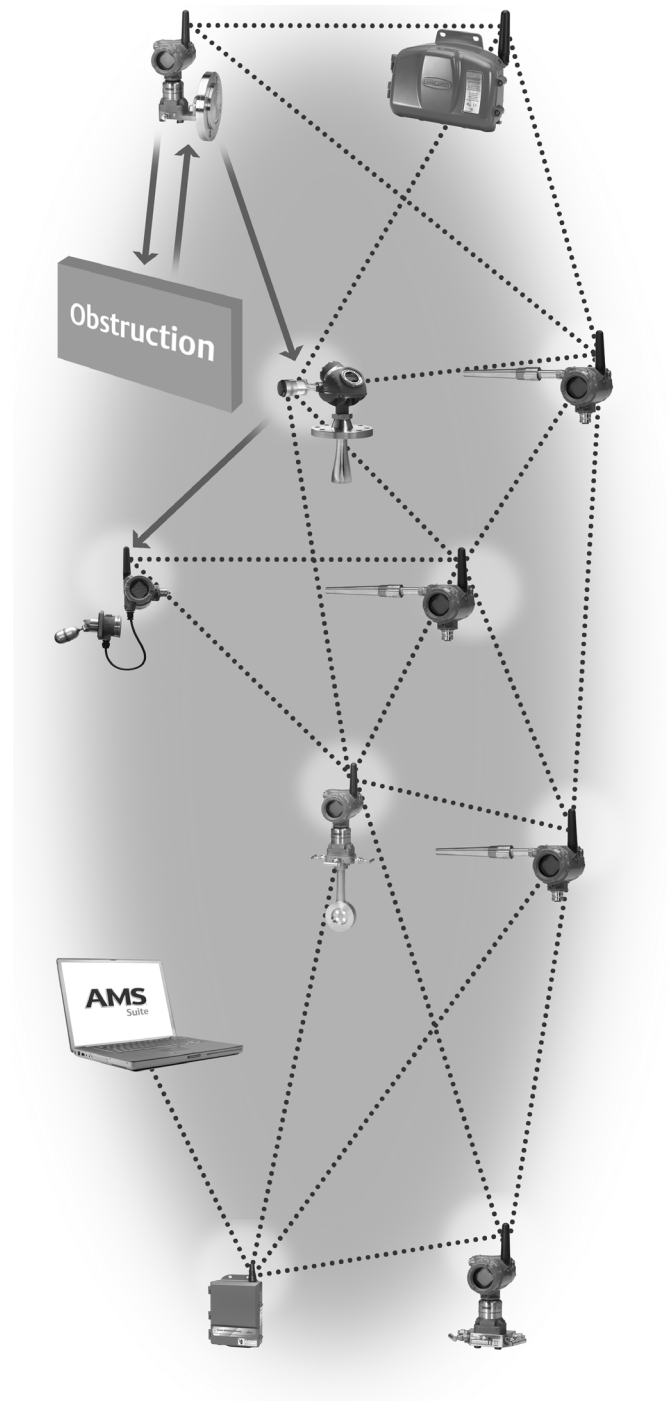
- Standard IEEE 802.15.4 radios
- 2.4 GHz ISM band sliced into 16 radio-channels.
- Continually “hop” across channels to avoid interference and increase reliability.
- Frequency hopping spread spectrum (FHSS) technology delivers high reliability in challenging radio environment.

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

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” on page 30 for sensor options.

Output

IEC 62591 (WirelessHART), 2.4 GHz DSSS

Ambient temperature limits

-40 to 85 °C (-40 to 185 °F)

Humidity limits

0-99% non-condensing relative humidity

Update rate

User selectable, 4 sec to 60 min.

Accuracy

(Pt 100 @ reference condition: 20 °C)

±0.30 °C (±0.54 °F)

For the complete list see “Accuracy” on page 30.

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 the criteria under European Union Directive 2004/108/EC
- Meets all relevant requirements of EN 61326

Transmitter stability

- ±0.15% of reading or 0.15 °C (0.27 °F), whichever is greater, for 2 years for RTDs
- ±0.15% of reading or 0.15 °C (0.27 °F), whichever is greater, for 1 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.⁽¹⁾

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

Sensor terminals

Sensor terminals permanently fixed to terminal block

Field Communicator connections

Communication terminals

Clips permanently fixed to terminal block

Materials of construction

Enclosure

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. (2.15 kg)

Enclosure ratings (Rosemount 848T Wireless)

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

Sensor connections

Optional voltage adapter

The Rosemount 848T Wireless voltage adapter allows voltage measurement from 0-10 volts. For this capability, one or two adapters are required. Each adapter accommodates 2 voltage inputs, and can be installed interchangeably on inputs 1 and 2 or 3 and 4.

The divider is ordered using option codes S003 or S004, and can also be purchased as a spare part.

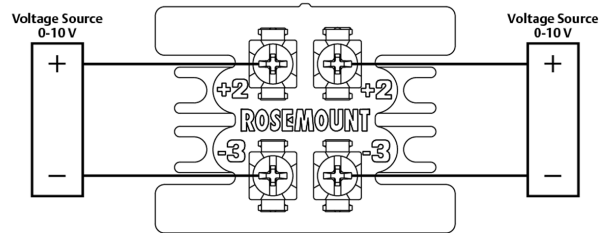
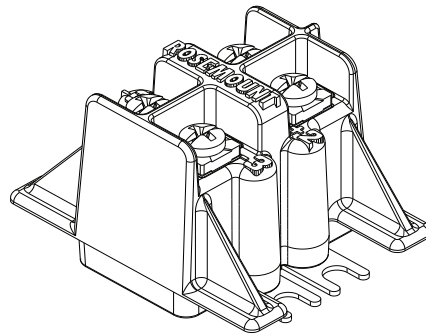
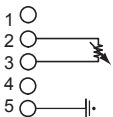
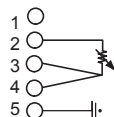


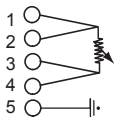
Figure 10. Rosemount 848T Wireless Sensor Connections Diagram



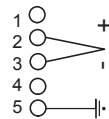
2-wire RTD and Ω



3-wire RTD and Ω



4-wire RTD and Ω



Thermocouple and mV

Accuracy

| Sensor option | Sensor reference | Input ranges | | Accuracy over range(s) | |
|---|--|---------------------------|---------------------------|---------------------------------------|-------------------|
| | | °C | °F | °C | °F |
| 2-, 3-, and 4-wire RTDs | | | | | |
| Pt 50 ($\alpha = 0.00391$) | GOST 6651-94 | -200 to 550 | -328 to 1022 | ± 0.57 | ± 1.03 |
| Pt 100 ($\alpha = 0.00391$) | GOST 6651-94 | -200 to 550 | -328 to 1022 | ± 0.28 | ± 0.50 |
| Pt 100 ($\alpha = 0.00385$) | IEC 751; $\alpha = 0.00385$, 1995 | -200 to 850 | -328 to 1562 | ± 0.30 | ± 0.54 |
| Pt 100 ($\alpha = 0.003916$) | JIS 1604, 1981 | -200 to 645 | -328 to 1193 | ± 0.30 | ± 0.54 |
| Pt 200 ($\alpha = 0.00385$) | IEC 751; $\alpha = 0.00385$, 1995 | -200 to 850 | -328 to 1562 | ± 0.54 | ± 0.98 |
| PT 200 ($\alpha = 0.003916$) | JIS 1604, 1981 ($\alpha = 0.003916$) | -200 to 645 | -328 to 1193 | ± 0.54 | ± 0.98 |
| Pt 500 ($\alpha = 0.00385$) | IEC 751; $\alpha = 0.00385$, 1995 | -200 to 850 | -328 to 1562 | ± 0.38 | ± 0.68 |
| Pt 1000 ($\alpha = 0.00385$)s | IEC 751; $\alpha = 0.00385$, 1995 | -200 to 300 | -328 to 572 | ± 0.40 | ± 0.72 |
| Ni 120 | Edison Curve No. 7 | -70 to 300 | -94 to 572 | ± 0.30 | ± 0.54 |
| Cu 10 | Edison Copper Winding No. 15 | -50 to 250 | -58 to 482 | ± 3.20 | ± 5.76 |
| Cu 100 (a=428) | GOST 6651-94 | -185 to 200 | -301 to 392 | ± 0.48 | ± 0.86 |
| Cu 50 (a=428) | GOST 6651-94 | -185 to 200 | -301 to 392 | ± 0.96 | ± 1.73 |
| Cu 100 (a=426) | GOST 6651-94 | -50 to 200 | -58 to 392 | ± 0.48 | ± 0.86 |
| Cu 50 (a=426) | GOST 6651-94 | -50 to 200 | -58 to 392 | ± 0.96 | ± 1.73 |
| Thermocouples—cold junction adds + 0.5 °C to listed accuracy | | | | | |
| 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 2502 | ± 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 |
| 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 |
| Input units | | | | | |
| 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 | |
| 1000 mV input | | 0 to 10 V | | greater of ± 10 mV or 0.2% of span | |
| 4–20 mA (Rosemount) ⁽¹⁾ | | 4–20 mA | | ± 0.01 mA | |
| 4–20 mA (NAMUR) ⁽¹⁾ | | 4–20 mA | | ± 0.01 mA | |

1. Requires the S002 option code.

Analog sensors 4–20mA

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 [Table 15](#).

Table 15. 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 and 85 °C (–40 and 185 °F).

| NIST type | Accuracy per 1.0 °C (1.8 °F) change in ambient temperature ⁽¹⁾⁽²⁾ | Temperature range (°C) |
|--|---|---|
| RTD | | |
| Pt 50 ($\alpha = 0.003910$) | 0.004 °C (0.0072 °F) | N/A |
| Pt 100 ($\alpha = 0.00391$) | 0.002 °C (0.0036 °F) | N/A |
| Pt 100 ($\alpha = 0.00385$) | 0.003 °C (0.0054 °F) | N/A |
| Pt 100 ($\alpha = 0.003916$) | 0.003 °C (0.0054 °F) | N/A |
| Pt 200 ($\alpha = 0.00385$) | 0.004 °C (0.0072 °F) | N/A |
| PT 200 ($\alpha = 0.003916$) | 0.004 °C (0.0072 °F) | N/A |
| 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 |
| Thermocouple (R = the value of the reading) | | |
| 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 |
| Input units | | |
| 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 (20 °C [68 °F] 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, temperature effects would be:

- 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 1.4

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 EU Declaration of Conformity can be found at the end of the Quick Start Guide. The most recent revision of the EU Declaration of Conformity can be found at Emerson.com/Rosemount.

Ordinary Location Certification

As standard, the transmitter has been examined and tested to determine that the design meets the basic electrical, mechanical, and fire protection requirements by a nationally recognized test laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

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** FM Intrinsically Safe
 Certificate: 303437
 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_a ≤ +70 °C), when installed per Rosemount drawing 00849-1000; Type 4X; IP66
 See [Table 16 on page -36](#) at the end of the Product Certifications section for Entity Parameters.

- N5** FM Class I, 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 °C ≤ T_a ≤ +70 °C); DIP CL II/III DIV 1, GP E, F, G; -50 °C ≤ T_a ≤ +85 °C; when installed per Rosemount drawing 00849-1000; Type 4X; IP66

Canada

- I6** CSA Intrinsically Safe
 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 16 on page -36](#) at the end of the Product Certifications section for Entity Parameters.
- N6** CSA 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 °C ≤ T_a ≤ +70 °C), T5(-60 °C ≤ T_a ≤ +40 °C);
 See [Table 16 on page -36](#) 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 701PBKKF 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

- 17** IECEx Intrinsic Safety
 Certificate: IECEx BAS 09.0004X
 Standards: IEC 60079-0:2011, IEC 60079-11:2011;
 Markings: Ex ia IIC T4/T5 Ga, T4(-60 °C ≤ T_a ≤ +70 °C),
 T5(-60 °C ≤ T_a ≤ +40 °C);
 See [Table 16 on page -36](#) 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 701PBKKF 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

- 12** INMETRO Intrinsic Safety
 Certificate: UL-BR 15.0034X
 Standards: ABNT NBR IEC 60079-0:2008 + Corrigendum
 1:2011, ABNT NBR IEC 60079-11:2009
 Markings: Ex ia IIC T4/T5, T4(-60 °C ≤ T_a ≤ +70 °C), T5
 (-60 °C ≤ T_a ≤ +40 °C)
 See [Table 16 on page -36](#) at the end of the
 product certifications section for entity
 parameters.

Special Conditions 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 701PBKKF 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. 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

- 13** NEPSI Intrinsic Safety
 Certificate: GYJ16.1205X
 Markings: Ex ia IIC T4/T5 Ga, T4(-60 °C ≤ T_a ≤ +70 °C),
 T5(-60 °C ≤ T_a ≤ +40 °C)
 See [Table 16 on page -36](#) at the end of the
 Product Certifications section for Entity
 Parameters.

Special Conditions 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_a ≤ +70 °C), T5(-60 °C ≤ T_a ≤ +40 °C); IP66/IP67
 See [Table 16 on page -36](#) at the end of the Product Certifications section for Entity Parameters.

Japan

I4 TIIS Intrinsic Safety
 Certificate: TC19154
 Markings: Ex ia IIC T4, T4(-20 °C ≤ T_a ≤ +60 °C)
 See [Table 16 on page -36](#) at the end of the Product Certifications section for Entity Parameters.

Additional Certifications

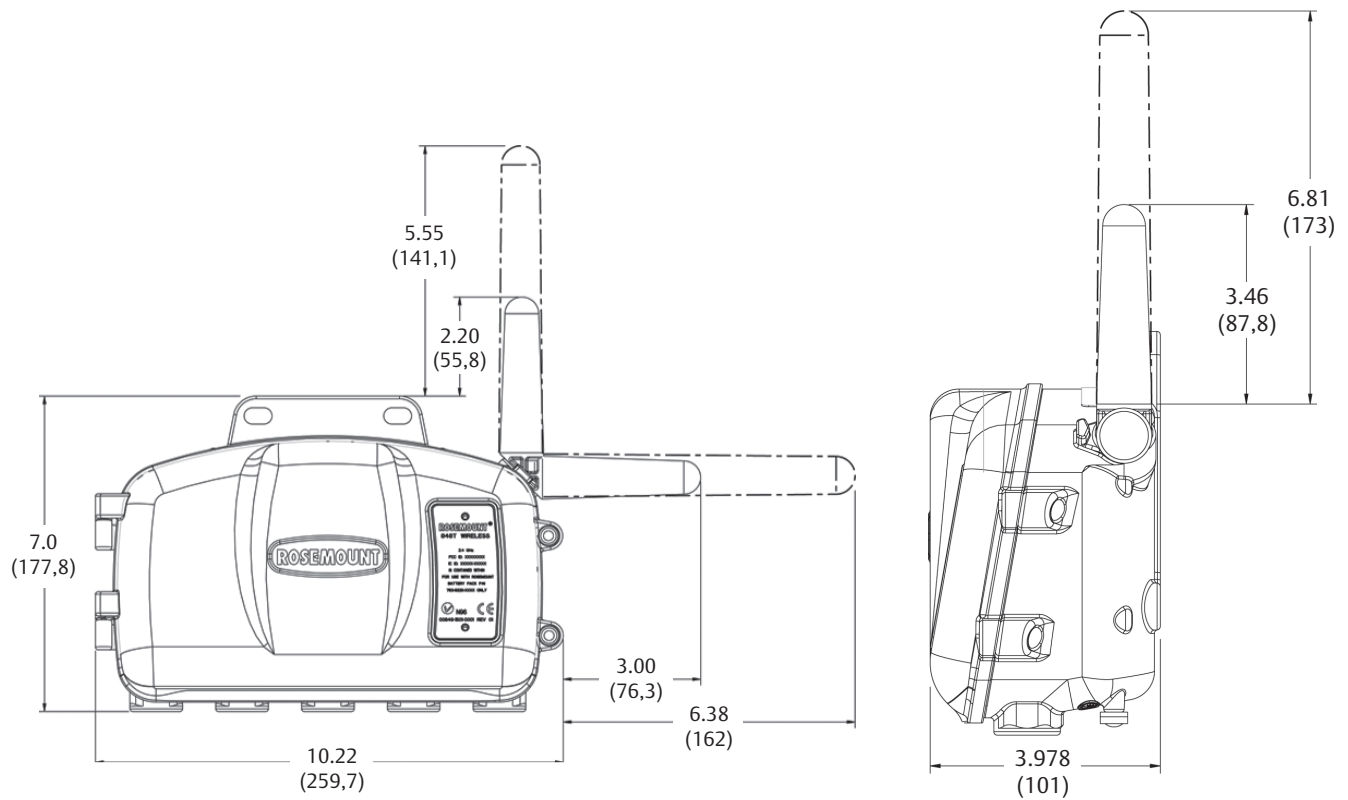
SBV Bureau Veritas (BV) Type Approval
 Certificate: 26325/A3 BV
 Requirements: Bureau Veritas Rules for the Classification of Steel Ships

Table 16. Entity Parameters

| | FM | CSA | ATEX/IECEX/ NEPSI/EAC/ TIIS/INMETRO |
|---------------------------------------|------|------|---|
| Voltage U₀ (V) | 6.51 | 6.6 | 6.6 |
| Current I₀ (mA) | 3.12 | 3.2 | 3.2 |
| Power P₀ (mW) | 5.1 | 20.4 | 5.3 |
| Capacitance C₀ (μF) | 22 | 22 | 22 |
| Inductance L₀ (H) | 1 | 1 | 1 |

Dimensional drawings

Figure 11. Rosemount 848T Wireless




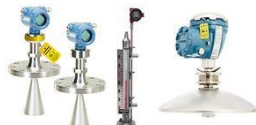










Dimensions are in inches (millimeters).



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