

Rosemount™ 214C Temperature Sensors



Primary product benefits

- High accuracy resistance temperature detectors (RTD) and various thermocouple types offered in a variety of element configurations
- Calibration capabilities for increased measurement accuracy for RTDs

Rosemount 214C Temperature Sensors

Optimize plant efficiency and increase measurement reliability with industry-proven design and specifications

- All sensor styles and lengths available as standard in ¼-in. (6 mm) nominal diameter
- State-of-the-art manufacturing processes providing robust element packaging, increasing reliability
- Industry-leading calibration capabilities allowing for Callendar-Van Dusen values giving increased RTD accuracy when paired with Rosemount transmitters
- Optional Class A accuracy RTDs or Class 1/Special Tolerances thermocouples for critical temperature measurement points

Explore the benefits of a Complete Point Solution™ from Emerson

- “Transmitter assembled to sensor” and “Thermowell assembled to sensor” options enable Emerson to provide a complete point temperature solution, delivering process-ready or hand-tight transmitter, sensor, and/or thermowell assemblies
- Complete portfolio of Single Point and Multi-Input Temperature Measurement solutions, allowing effective measurement and processes control with the trusted reliability from Rosemount products

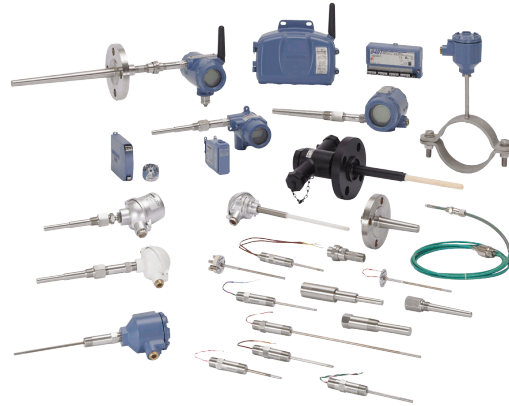


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Experience global consistency and local support from numerous worldwide Emerson manufacturing sites

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



Rosemount 214C Sensor

The Rosemount 214C Sensors are designed to provide flexible and reliable temperature measurements in process monitoring and control environments.

Features include:

- Temperature ranges of -321 to 1112 °F (-196 to 600 °C) for RTDs and -321 to 2192 °F (-196 to 1200 °C) for thermocouples
- Industry-standard sensor types: PT100 RTDs; thermocouple Type J, Type K, and Type T
- Spring-loaded and compact spring-loaded sensor mounting styles
- Hazardous location product approvals and certification
- Calibration services to give insight to sensor performance
- Calibration certificate to accompany sensor

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

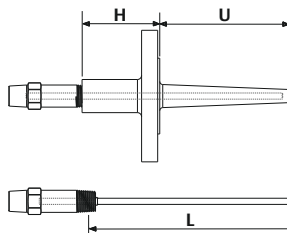
Figure 1: Model Number Ordering Example

Model				Sensor type		Sheath material		Sensor accuracy		Number of elements		Units	Sensor insertion length				Sensor mounting style		Options
2	1	4	C	R	W	S	M	A	1	S	4	E	0	1	5	0	S	L	WR5, ES...
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	XXXXX

The numbers below the model string example in [Figure 1](#) correlate to the character place numbers in the ordering table.

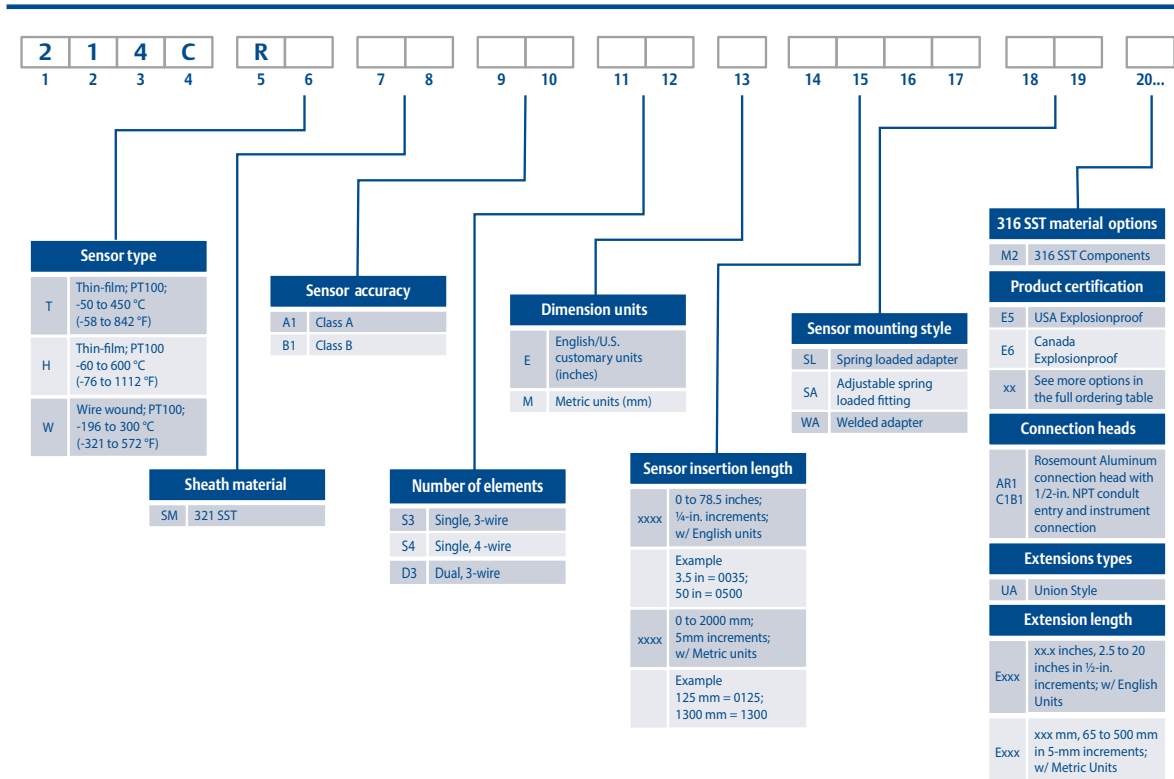
Ensure sensor fits thermowell

Rosemount 114C Head length (H) + Immersion length (U) = Rosemount 214C Sensor insertion length (L).



RTD ordering information

Table 1: Rosemount 214C RTD Quick Order Table



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.

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 the fastest delivery times. The non-starred offerings are subject to additional delivery lead time.

Rosemount™ 114C Thermowells



- Wide variety of industry standard process connections including flanged, threaded, welded, and Van Stone.
- Large selection of thermowell materials to ensure proper process compatibility from stainless steel to exotic materials such as duplex and alloy C-276.
- Additional thermowell options and certificates available.

Rosemount 114C Thermowell

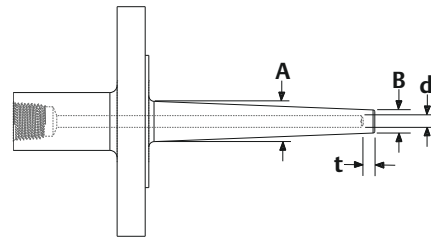
Product overview

Temperature sensors are rarely inserted directly into an industrial process. They are installed into a thermowell to isolate them from the potentially damaging process conditions of flow-induced stresses, high pressure, and corrosive chemical effects. Thermowells are closed-end metal tubes or barstock installed into the process vessel or piping and become an integral pressure-tight part of the process vessel or pipe. They permit the sensor to be quickly and easily removed from the process for calibration or replacement without requiring a process shutdown and possible drainage of the pipe or vessel.

The Rosemount 114C Thermowell is made from solid barstock to ensure strength and integrity. The Rosemount 114C was designed to accommodate a host of industry standard configurations, but has the flexibility to adapt to special configurations for different types of applications.

Flexible design modifiers accommodate many process requirements

- Different sizes of root (A), tip (B), and bore (d) diameters
- Different tip (t) thickness as required
- Numerous combinations for various industrial applications
- Meet ASME PTC 19.3 TW standard with flexible design



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Perform thermowell calculations using Rosemount's Thermowell Design Accelerator



Save design time and resources

- Performs automatic re-calculations of failed tags
- Performs batch calculations of 500 plus thermowells

Solutions for difficult applications

- Suggests alternate technologies if a calculation fails, such as Rosemount X-well Technology or Twisted Square

Assurance of quality and compliance

- Ensure design meets latest ASME PTC 19.3 TW standards
- Efficiently guides you to the best product for your application

Easy-to-use, intuitive user experience

- Automated troubleshooting assistance
- Generates Emerson thermowell and sensor models

Wide range of thermowell options and certificates for any application

- Options for special testing requirements, such as External Hydrostatic Pressure Test (Q5) and Dye Penetration Test (Q73)
- Options to ensure material traceability or compatibility, including Positive Material Identification or PMI (Q76), Material Certification (Q8), Thermowell X-ray/Radiograph (Q81), and NACE® Approval (Q35)
- Options for special processing requirements such as Electropolishing (R20)

Experience global consistency and local support from numerous worldwide Emerson manufacturing sites

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



Explore the benefits of a Complete Point Solution™ from Emerson

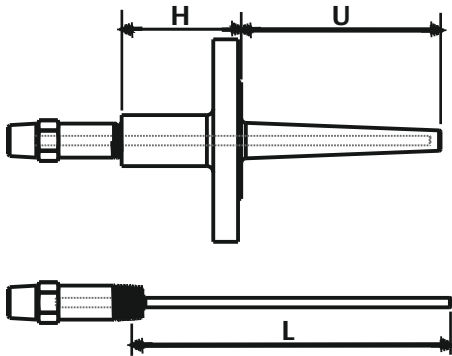
- An “Assemble Sensor to Specific Transmitter” and “Assemble Sensor to Specific Thermowell” option enables Emerson to provide a Complete Point Solution for measuring temperature, delivering an installation-ready transmitter, sensor, and thermowell assembly.

- Emerson has a complete portfolio of single-point and multi-input temperature measurement solutions, allowing effective measurement and process control with reliable Rosemount products.

Selection guide

Ensure sensor fits thermowell

Rosemount 114C Head length (H) + Immersion length (U) = Rosemount 214C Sensor insertion length (L).



Basic selection guide

Selecting the proper thermowell for an application is an important activity as it impacts plant safety and measurement efficiency. Thermowells are considered a wetted part; they physically become part of the pressure retaining system.

The four major factors to consider when selecting a thermowell for an application are described below:

Thermowell length

There is no standard formula to determine thermowell immersion length. However, there are a few common practices that the process industry follows along with good engineering judgment. Ideally, the thermowell tip should be located near the centerline in turbulent flow conditions, because this represents the most accurate process temperature.

To ensure optimal performance, a general guideline for immersion length into a pipe is as follows:

- 10× the thermowell root diameter for air or gas
- 5× the thermowell root diameter for liquids

Another guideline is at least one-third the way into the pipe for any measurement. The American Petroleum Institute (API) has a specific recommendation of using an immersion length of the sensing element plus 2-in. (50 mm).

Mounting configuration

Consider how the thermowell is mounted on the pipe or tank. The process designer typically specifies what mating connection will be used and the thermowell selected should match that connection. Temperature, pressure, and material are usually taken into consideration to ensure the process connection will be adequate for the application. Welded, threaded, flanged, and Van Stone are standard mounting configuration options.

Thermowell stem profile

Factors to be considered when selecting a stem style include the process pressure, required response speed of the measurement, drag force of the fluid flow on the well, and the wake frequency. The stem or shank is the part of a thermowell inserted into the process piping or vessel. Straight, stepped, and tapered stem styles are available. Each profile has its advantages depending on the need and situation.

Thermowell material

Rosemount Thermowells are supplied in most materials required for industrial applications. Standard materials are 316/316L Stainless Steel, 304/304L Stainless Steel, and A105 Carbon Steel. For corrosive environments, special materials such as Alloy C-276 and Alloy 600 are also available. See the ordering table for a complete listing of standard materials. Contact your local Emerson representative for additional material availability.

Specifications and options

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Optimizing lead time

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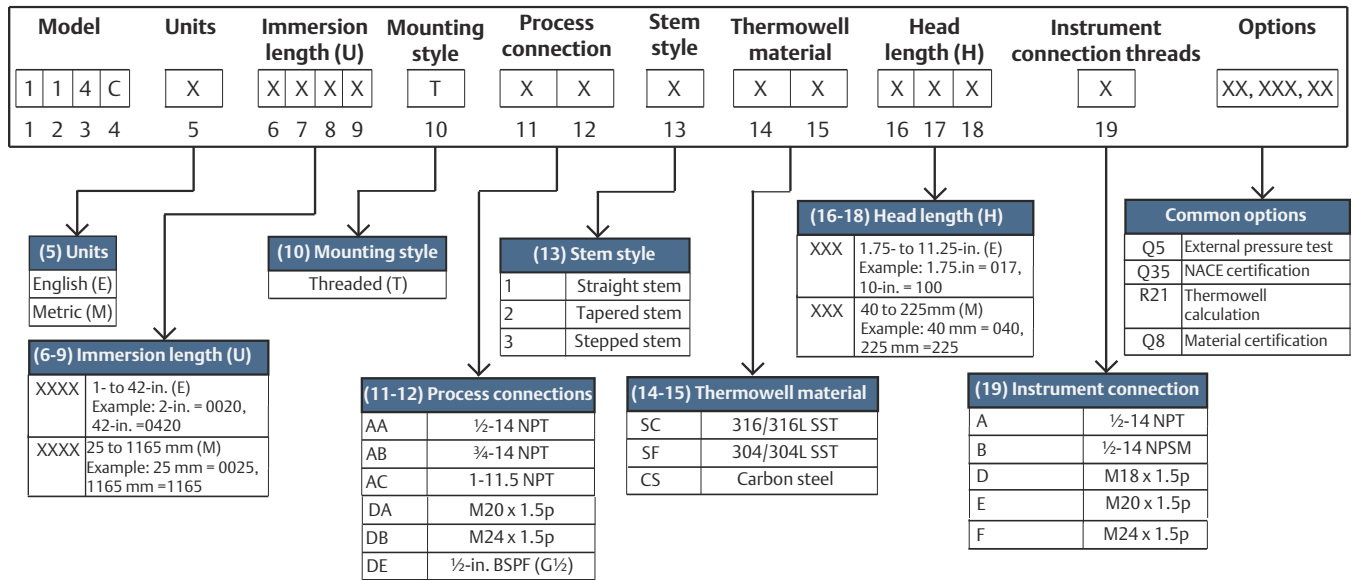
Rosemount 114C Threaded Thermowell



Threaded thermowell overview

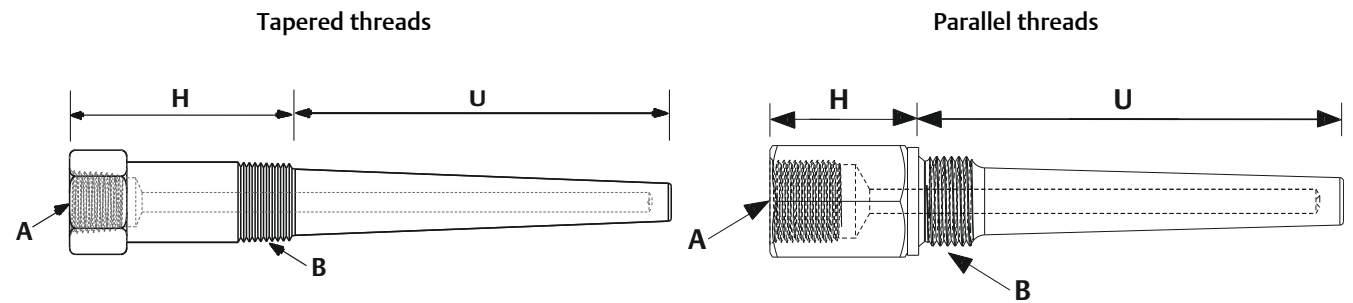
Threaded thermowells are threaded into a process pipe or tank, allowing for easy installation and removal when necessary. While this is a common mounting method, it has the lowest pressure rating of all mounting configuration options.

Figure 1: Standard Offering–Threaded



The common options shown in Figure 1 represent a partial offering; reference the [Threaded ordering information](#) for a full list of available options.

Figure 2: Threaded Thermowell Components



- A. Instrument connection
- B. Process connection
- H. Head length
- U. Immersion length

Note

Wetted surface includes engaged threads and immersion length (U).

Rosemount™ 248 Temperature Transmitter



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

Features and benefits

- RTD, TC, potentiometer, linear resistance and bipolar mV input
- Wide ambient operating temperature of -50 to +85 °C
- 2.5 kVAC galvanic isolation

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

- DIN B style head mount transmitter
- Variety of DIN B enclosure options
- HART®/4–20 mA Protocol
- Single sensor capability with universal sensor inputs (RTD, T/C, mV, ohms)
- Transmitter-sensor matching with Callendar Van Dusen constants
- SIL2 Capable: IEC 61508 certified by an accredited third party agency for use in safety instrumented systems up to SIL 2



Standard transmitter design provides flexible and reliable performance in process environments

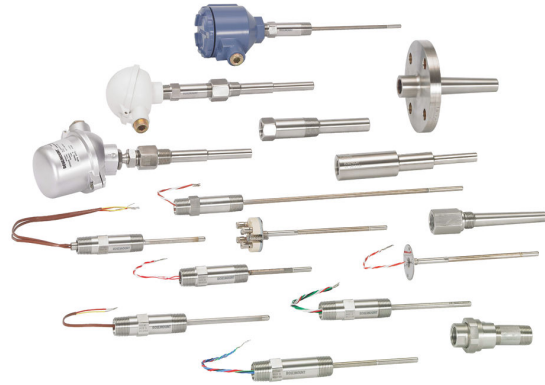
- Offers improved measurement accuracy and reliability over direct-wiring a sensor to the digital control system for a lower overall installation cost
- One-year stability rating reduces maintenance costs
- Open/short sensor diagnostics assist with detecting issues in the sensor loop
- Compensation for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

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Explore the benefits of a complete point solution from Rosemount Temperature Measurement

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



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



- Experienced Instrumentation Consultants help select the right product for any temperature application and advise on best installation practices
- An extensive global network of Emerson service and support personnel can be on-site when and where they are needed
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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