

Resistance Temperature Sensors for Hygienic and Sanitary Applications



Product Discontinued

- Resistance temperature sensors for applications in the food and beverage, pharmaceutical and life-science industries
- Aseptic process connections suitable for CIP and SIP dead-pocket free measurement applications
- Exchangeable measuring insert to ensure process integrity
- Enhanced system accuracy with transmitter-sensor matching, meets pharmaceutical industry requirements

Rosemount 65Q Sensor

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

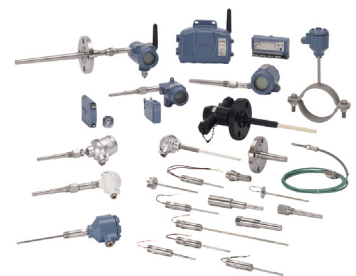
- RTD elements for a reliable and accurate measurement point
- Available in a wide variety of process connections for sanitary and hygienic applications
- Meets EHEDG and 3-A Standard requirements for use in a variety of sanitary
- Flying leads, terminal blocks, and cable connections to suit different wiring needs
- State of the art manufacturing procedures provide robust element packaging, increasing reliability
- Industry-leading calibration capabilities allow for Callendar-van-Dusen values to give increased accuracy when paired with Rosemount transmitters

Streamline operations and maintenance with sensor and thermowell design

- Process connections allow for quick and easy connection to industry-standard sanitary process connection points
- Integral thermowell protection on 65Q allows for ordering sanitary sensor and thermowell together

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

- An “Assemble Sensor to Specific Transmitter” option enables Emerson to provide a complete point temperature solution, delivering an installation-ready transmitter and sensor assembly.
- Emerson has a complete portfolio of Single Point and High Density Temperature Measurement solutions, allowing you to effectively measure and control your processes with the reliability you trust from Rosemount products.



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



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

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Rosemount 65Q Sanitary Sensor



The Rosemount 65Q Sanitary Sensor has designs that provide flexible and reliable temperature measurements in hygienic process environments.

Features include:

- – 50 to 450 °C temperature range
- Industry-standard RTD sensor design
- 3-A and EHEDG Standards approval
- Variety of enclosure and connection head options
- Global hazardous-location approvals (Option Code I1)
- Calibration services to give you insight to sensor performance (Option Codes V10, V11)
- Electropolishing Surface Finish (Option Code R20)
- Assemble to Transmitter option (Option Code XA)

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See [page 10](#) for more information on Material Selection.

Table 1. 65Q RTD Assembly (Pt 100) for Hygienic and Food and Beverage Applications

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is subject to additional delivery lead time.

Model	Product description			
0065Q	65Q RTD Sensor with Twell for Sanitary Applications			
Connection head		IP rating ⁽¹⁾	Connection thread	
C	Rosemount Aluminum	68	M20 x 1.5	★
D	Rosemount Aluminum	68	1/2-in. NPT	★
1	Rosemount, Aluminum with LCD Display Cover	68	M20 x 1.5	★
2	Rosemount, Aluminum with LCD Display Cover	68	1/2-in. NPT	★
5	Connection Head DIN A Polished Stainless Steel with LCD Display Cover	68	M20 x 1.5	★
6	Connection Head DIN A Polished Stainless Steel with LCD Display Cover	68	1/2-in. NPT	★
E	Connection Head DIN A Polished Stainless Steel	68	M20 x 1.5	★
F	Connection Head DIN A Polished Stainless Steel	68	1/2-in. NPT	★
R	Connection Head DIN B Polished Stainless Steel	66	M20 x 1.5	★
S	Connection Head DIN B Polished Stainless Steel	66	1/2-in. NPT	★
J	GR-A/BL (BUZ), Aluminum	65	M20 x 1.5 (with cable gland)	
L	TZ-A/BL (BUZH) Aluminum	65	M20 x 1.5 (with cable gland)	
T	TZ-A/BK, Polyamide, Black	65	M20 x 1.5 (with cable gland)	

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Sensor lead wire termination				
0	Flying Leads – No Springs on DIN plate		★	
2	Terminal Block – DIN 43762		★	
Sensor type		Temperature range		
1	RTD, Single Element, 4-wire		★	
2	RTD, Dual Element, 3-wire		★	
5	RTD, Single Element, 3-wire		★	
Extension				
S	Tubular with Extension, Welded Screw Bush M24 x 1.5		★	
Z	Tubular with Extension, Head Connection Adjustable Loose Screw Nut M24 x 1.5		★	
Extension length (N) in millimeters				
0050 ⁽²⁾	50 mm		★	
0065 ⁽³⁾	65 mm		★	
0130	130 mm		★	
XXXX	Non-standard extension length – non-standard lengths are available from 50 to 990 mm		★	
Thermowell material				
D	1.4404 (AISI 316L) Stainless Steel, ≤ 0.8 μm electropolishing		★	
Immersion length (L) in millimeters				
0025	25 mm – not available for Mounting Style code T02		★	
0050	50 mm		★	
0065	65 mm		★	
0100	100 mm		★	
0150	150 mm		★	
0200	200 mm		★	
0250	250 mm		★	
XXXX	Non-standard immersion length – non-standard lengths are available from 25 to 2500 mm			
Thermowell mounting style	Process connection		Stem style	
C02	Flanged	1-in. Tri-Clamp™ (diameter 50.4 mm)	Stepped, 10/6 mm ⁽⁴⁾	★
C04	Flanged	1½-in. Tri-Clamp (diameter 50.4 mm)	Stepped, 10/6 mm ⁽⁴⁾	★
C06	Flanged	2-in. Tri-Clamp (diameter 64 mm)	Stepped, 10/6 mm ⁽⁴⁾	★
C08	Flanged	2½-in. Tri-Clamp (diameter 77.4 mm)	Stepped, 10/6 mm ⁽⁴⁾	★
C10	Flanged	3-in. Tri-Clamp (diameter 91 mm)	Stepped, 10/6 mm ⁽⁴⁾	★
C12	Flanged	4-in. Tri-Clamp (diameter 119 mm)	Stepped, 10/6 mm ⁽⁴⁾	★
C14	Flanged	½-in. Tri-Clamp (diameter 24.9 mm)	Stepped, 10/6 mm ⁽⁴⁾	★

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C16	Flanged	³ / ₄ -in. Tri-Clamp (diameter 37.4 mm)	Stepped, 10/6 mm ⁽⁴⁾	★
K02	Weld-in	Ball (adjustable), diameter 25 mm, PEEK Seal	Straight, 6 mm ⁽⁵⁾	★
K04	Weld-in	Ball (adjustable), diameter 25 mm, SST Seal	Straight, 6 mm ⁽⁵⁾	★
M10	Tapered with Coupling Nut ⁽⁶⁾	Suitable connection for tube nominal size DN 10	Stepped, 10/6 mm ⁽⁴⁾	★
M25	Tapered Union with Coupling Nut ⁽⁶⁾	Suitable connection for tube nominal size DN 25	Stepped, 10/6 mm ⁽⁴⁾	★
M32	Tapered Union with Coupling Nut ⁽⁶⁾	Suitable connection for tube nominal size DN 32	Stepped, 10/6 mm ⁽⁴⁾	★
M40	Tapered Union with Coupling Nut ⁽⁶⁾	Suitable connection for tube nominal size DN 40	Stepped, 10/6 mm ⁽⁴⁾	★
M50	Tapered Union with Coupling Nut ⁽⁶⁾	Suitable connection for tube nominal size DN 50	Stepped, 10/6 mm ⁽⁴⁾	★
T02	Threaded Parallel	¹ / ₂ -in. (¹ / ₂ -in. BSPF) (G ¹ / ₂)	Stepped, 10/6 mm ⁽⁷⁾	★
T12	Threaded Tapered	¹ / ₂ -in. NPT	Stepped, 10/6 mm ⁽⁴⁾	★
V04	VARIVENT [®] DN 1 1/2 - 3 inch (Dim. 68 mm) Standard			★

Options (include with selected model number)

Sensor options				
A3	Single Element Class ¹ / ₃ DIN B Sensor	0 to 100 °C (-32 to 212 °F)		
A4	Dual Element Class ¹ / ₃ DIN B Sensor	0 to 100 °C (-32 to 212 °F)		
Product certifications				
I1	EEx ia ATEX/IBExU Intrinsic Safety Approval			★
Cable gland option				
G2	Cable Gland, EEx d, Brass 7.5 mm - 11.9 mm			★
Cover chain option				
G3	Cover Chain (only available with Connection Head Material codes C and D)			★
Extension ring				
G6	Aluminum Extension Ring for Dual Transmitter Mounting (only available with Connection Head Material codes C and D)			★
Material certification				
Q8	Thermowell Material Certification			★
Extension ring				
R20	Electropolishing Surface Finish of wetted parts, R _a = 0.4 μm			
Assemble to options				
XA ⁽⁸⁾	Assemble Sensor to Specific Temperature Transmitter			★

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Standard calibration (with A, B, C and Callendar-van Dusen constants)		
V10	Works Certificate – Sensor Calibration from –50 to 450 °C (-58 to 842 °F)	★
V11	Works Certificate – Sensor Calibration from 0 to 100 °C (-32 to 212 °F)	★
Temperature range		
X8	Works Certificate – Sensor Calibration Over Specified Temperature Range with A, B, C, and Callendar-van Dusen constants	★
Typical model number: 0065Q C 0 1 S 0050 D 0200 C04 XA		

- (1) IP 68 rating requires a suitable cable gland on the conduit connection thread. All threads must be sealed.
- (2) Standard length for use with Connection Head codes C, D, 1, and 2.
- (3) Standard length for use with Connection Head codes E, F, J, L, R, S, T, 5, and 6.
- (4) For U < 50 mm, outer diameter 6 mm straight, below part of process connection.
- (5) Valid for DIN B connection heads only.
- (6) According to DIN 11851.
- (7) For $U_p \leq 65$ mm, the outer diameter is 6 mm for straight stem styles.
- (8) If ordering XA with a transmitter, specify the same option on the transmitter model number.

Introduction

Rosemount Series 65Q Temperature Sensor is designed for use in hygienic and aseptic applications exclusively to meet the stringent quality requirements in the Food and Beverage, and Pharmaceutical industries. Rosemount temperature products are manufactured according to Good Manufacturing Practice (GMP) guidelines and comply with the standards of the European Hygienic Equipment Design Group (EHEDG) as well as 3A standards.

National and international guidelines

Products that may have a direct or indirect impact on public health, must be produced according to national and international guidelines. The guidelines contain rules for the implementation and organization of methods, production, production environments, and inspections.

The European Hygienic Equipment Design Group (EHEDG) is a foundation in which mainly users and manufacturers of hygienic equipment are represented. EHEDG provides guidance of the hygienic engineering aspects of manufacturing of safe and wholesome food, e.g. through production, publication, and updating of guidelines, equipment approval through certification to assist equipment suppliers and food manufacturers and advisory function to legislators and standards groups.

EHEDG cooperation with 3-A

EHEDG cooperates with 3-A Sanitary Standards, Inc. in the development of hygienic construction material selection and design standards for food and dairy processing equipment. 3-A Sanitary Standards and Practices have been developed for use by the dairy industry, dairy equipment manufacturers, and milk regulatory agencies as voluntary guidelines. These voluntary guidelines are used as a benchmark for product performance, hygienic quality, and ultimately food safety. 3-A Sanitary Standards and Practices are generally accepted by federal, state, and local public health authorities in the United States and other public health authorities around the world.

While 3-A Sanitary Standards have been in development and use since the late 1920's. EHEDG is a fairly recent development that applies test criteria and laboratory test data for determining cleanability and acceptance for equipment use in the processing of foods or comestibles. Both EHEDG and 3-A Sanitary Standards may be applied not only to Food and Beverage processing equipment, but can also be applied to Biotech and Bio-pharm equipment to ensure product acceptance and safety.

Mounting configurations

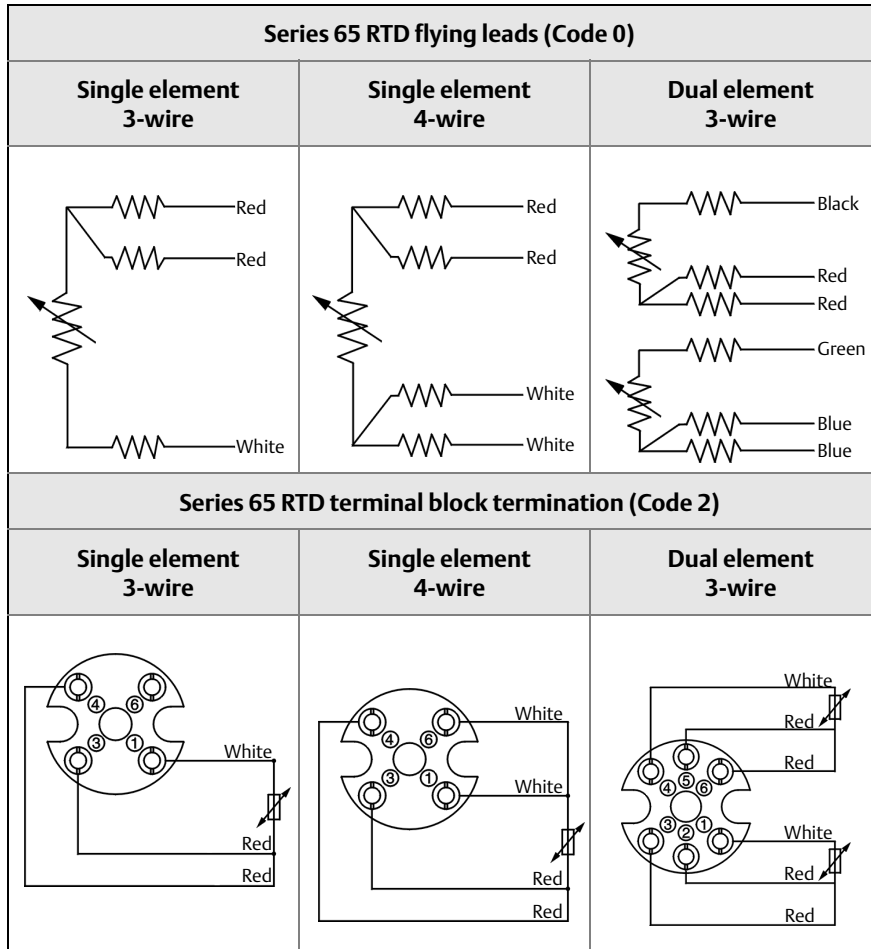
The Rosemount 65Q can be ordered with flying leads or terminal block. Ordered with flying leads, the sensors are designed with an integral mounting plate, and are for use with a head-mount transmitter attached directly to the sensor. The flying lead configuration facilitates removal of the sensor and transmitter as one assembly. The configuration with terminal block allows only the mounting of transmitter into the cover of several DIN size connection heads or requires the use of field mount transmitter.

Series 65Q RTD – sanitary applications

Rosemount Series 65Q Integral Mount Temperature Sensors are designed for use in hygienic, food and beverage applications when fitted with the Tri-Clamp, adjustable Weld-in Ball or Tapered Union with Coupling Nut according to DIN 11851 (Dairy Connection) process connections which do not need to meet as harsh aseptic requirements as requested for BioPharm applications. Alternatively for direct insertion into non-hygienic processes, the Series 65Q Temperature Sensor can be ordered optional with G $\frac{1}{2}$ -in. ($\frac{1}{2}$ -in. BSPF) or $\frac{1}{2}$ -in. NPT thread mounting.

The 65Q is available alone or as complete assemblies including connection heads, thermowells with weld-on process connections. This offering is designed to be used in complete temperature assemblies including Rosemount Temperature Transmitters. The RTD sensors meet most critical parameters of international standards - DIN EN 60751 incorporating Amendments 1 and 2. All sensors are available in a variety of lengths and ranges with terminal block or flying leads.

Figure 1. Rosemount 65Q Lead Wire Termination



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 Process Management 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.

Nominal resistance

In accordance with DIN EN 60751, the nominal resistance is defined as follows:

- 100 Ω RTD at 0 °C
- Temperature coefficient $\alpha = 0.00385 \Omega \times ^\circ\text{C}/\Omega$, averaged between 0 and 100 °C

Limit deviations

Tolerance Class A as standard: $t = \pm (0.15 + 0.002 \times t)$; valid for the temperature range from 0 to +350 °C

Lead wire configuration

As single element (1Pt 100) with 3 or 4 lead wires or dual element (2Pt 100) with 3 lead wires

Response time

Less than 12 seconds to reach 63% step change in water flowing at 0.4 m/s

Process temperature range

-50 to +450 °C

The measurement range can be limited by the gasket in the process connection.

Ambient temperature

Housing without head-mounted transmitter

- Metal housings: -40 to +130 °C
- Plastic housings: -40 to +85 °C

Housing with head-mounted transmitter

- -40 to +85 °C

Maximum process pressure

Lower maximum pressure can be due to the process connection
Pressure ratings at 20 °C:

- Tri-Clamp: 10 bar
- Weld-in Ball with PEEK-Seal: 6 bar
- Weld-in Ball with SST-Seal: 40 bar
- Threaded: 40 bar
- Tapered Union with Coupling Nut: 10 bar
- VARIVENT: 10 bar

Shock and vibration resistance

According to DIN EN 60751: 2.8 g peak / 10...500 Hz

Self heating

0.15 °K/mW when measured per method defined in DIN EN 60751

Insulation resistance

1,000 M Ω minimum insulation resistance when measured at 500 Vdc and at room temperature

Sheath material

321 Stainless Steel with mineral-insulated cable construction

Lead wire

PTFE insulated, silver coated copper wire