Rosemount™ 0065/0185 Sensor Assembly
Quick Start Guide

NOTICE

This guide provides basic guidelines for Rosemount 0065 and 0185 Sensor models. It does not provide instructions for configuration, diagnostics, maintenance, service, troubleshooting, Explosion-proof, Flameproof, or intrinsically safe (I.S.) installations.

If the Rosemount 0065 or 0185 Sensor was ordered assembled to a temperature transmitter, see the appropriate Quick Start Guide for information on configuration and hazardous locations certifications.

WARNING

Explosions could result in death or serious injury.

Installation of this transmitter in an explosive environment must be in accordance with the appropriate local, national, and international standards, codes, and practices.

Conduit/cable entries

Unless marked, the conduit/cable entries in the transmitter housing use a $\frac{3}{4}$-14 NPT thread form. Entries marked “M20” are M20 x 1.5 thread form. On devices with multiple conduit entries, all entries will have the same thread form. Only use plugs, adapters, glands, or conduit with a compatible thread form when closing these entries.

Contents

Wiring diagrams ......................... 3  Product certifications ...................... 8
Sensor assembly dimensions ............. 5
1.0 Wiring diagrams

Figure 1. Rosemount Series 65 RTD Lead Wire Configuration

Flying leads and spring-loaded adapter (termination codes 0, 1, or 3 only)

Single element

<table>
<thead>
<tr>
<th>Single element</th>
<th>Dual element</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>Red</td>
</tr>
<tr>
<td>Red</td>
<td>Red</td>
</tr>
<tr>
<td>White</td>
<td>Black</td>
</tr>
<tr>
<td>Red</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td>Green</td>
</tr>
</tbody>
</table>

Terminal block (termination code 2 and 4)

<table>
<thead>
<tr>
<th>Single element</th>
<th>Dual element</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>3 Red</td>
</tr>
<tr>
<td>Red</td>
<td>2 Red</td>
</tr>
<tr>
<td>White</td>
<td>1 White</td>
</tr>
<tr>
<td>White</td>
<td>6 Red</td>
</tr>
<tr>
<td></td>
<td>5 Red</td>
</tr>
<tr>
<td></td>
<td>4 White</td>
</tr>
</tbody>
</table>

Note

For 3-wire systems use one white and two red leads. Do not connect the white leads. Insulate or terminate the unused white lead in a manner that prevents shorting to the ground. For 2-wire systems, connect both sets of leads.
Figure 2. Rosemount Series 185 Thermocouple Lead Wire Configuration

Thermocouple terminal block

Single element

Dual element

Note

To distinguish the two sensors in Rosemount Dual 185 Sensors (flying lead or spring loaded styles), the lead wires of one sensor will be longer than the other sensor.

Table 1. Rosemount Series 185 Thermocouple Characteristics

<table>
<thead>
<tr>
<th>Type</th>
<th>Alloys (wire color)</th>
<th>Sheath material</th>
<th>Temperature range (°C)</th>
<th>Limits of error interchangeability DIN EN 60584-2</th>
<th>Tolerance class</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
<td>Fe (+ black), Cu-Ni (-white)</td>
<td>1.4541 (321 SST)</td>
<td>-40 to 375, 375 to 750</td>
<td>1.5 °C, 0.004 t</td>
<td>1</td>
</tr>
<tr>
<td>K</td>
<td>Ni-Cr (+ green), Ni-Al (-white)</td>
<td>2.4816 (Alloy 600)</td>
<td>-40 to 375, 375 to 1000</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>N</td>
<td>Ni-Cr-Si (+ pink), Ni-Si (-white)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Ni-Cr (+violet), Cu-Ni (-white)</td>
<td>1.4541 (321 SST)</td>
<td>-40 to 375, 375 to 800</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>T</td>
<td>Cu (+brown), Cu-Ni (-white)</td>
<td></td>
<td>-40 to 125, 125 to 350</td>
<td>0.5 °C, 0.004 t</td>
<td>1</td>
</tr>
</tbody>
</table>
2.0 Sensor assembly dimensions

2.1 Sensor assembly without thermowell

Head or field mount transmitters

Rosemount 644 with LCD display meter

Rosemount 644

Rosemount 248

40 mm

25 mm

11 mm

40 mm

25 mm

11 mm

Sensor with flying leads, terminal block, or spring-loaded adapter

Extensions

★ ★ N dimension measures from thread engagement point.
2.2 Tubular thermowell sensor assembly

Head or field mount transmitters

Rosemount 644 with LCD display meter

Rosemount 644

248

Rosemount 644 with LCD display meter

Sensor with flying leads or terminal block

Threaded and flanged tubular thermowells

* * For straight threading, N dimension references bottom of hex. For tapered threading, N dimension references thread engagement point (bottom of thread).
2.3 Barstock thermowell sensor assembly

- Head or field mount transmitters
- Rosemount 644 with LCD display meter
- Rosemount 644
- Rosemount 248
- Rosemount IP 68 or IP 65 connection heads
- Sensor with flying leads, terminal block, or spring-loaded adapter
- Stand-alone extensions
- Weld-in, threaded or flanged barstock thermowells

!!! N dimension measures from thread engagement point.

!!! This dimension is 80 mm for Class 1500 and 2500 flanges.

1. The Rosemount 644 is available with or without a LCD display.
3.0 Product certifications

3.1 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.

3.2 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).

3.3 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.

3.4 Hazardous Locations Certifications

USA
E5 FM Explosionproof and Dust-Ignition proof
Certificate: FM17US0170X
Markings: XP CL I, Div 1, GP B, C, D; DIP CL II/III, Div 1, GP E, F, G; T5(–50 °C ≤ T9 ≤ +85 °C); Type 4X

Canada
E6 CSA Explosionproof and Dust-Ignition proof
Certificate: 1063635
Markings: XP CL I, Div 1, GP B, C, D; DIP CL II/III, Div 1, GP E, F, G; CL i, Div 2, GP A, B, C, D; (–50 °C ≤ T9 ≤ +85 °C)

Europe
E1 ATEX Flameproof
Certificate: FM12ATEX0065X
Markings: II 2 G Ex db IIC T6...T1 Gb, T6(–50 °C ≤ T9 ≤ +40 °C), T5...T1(–50 °C ≤ T9 ≤ +60 °C)
**Specific Conditions of Use:**
1. See certificate for ambient temperature range.
2. The non-metallic label may store an electrostatic charge and become a source of ignition in Group III environments.
3. Guard the LCD display cover against impact energies greater than 4 joules.
4. Flameproof joints are not intended for repair.
5. A suitable certified Ex d or Ex tb enclosure is required to be connected to temperature probes with Enclosure option “N”.
6. Care shall be taken by the end user to ensure that the external surface temperature on the equipment and the neck of DIN Style Sensor probe does not exceed 130 °C.
7. Non-Standard Paint options may cause risk from electrostatic discharge. Avoid installations that cause electrostatic build-up painted surfaces, and only clean the painted surfaces with a damp cloth. If paint is ordered through a special option code, contact the manufacturer for more information.

### I1 ATEX Intrinsic Safety
Certificate: Baseefa16ATEX0101X
Markings: II 1 G Ex ia IIC T5/T6 Ga (see certificate for schedule)

<table>
<thead>
<tr>
<th>Thermocouples; $P_i = 500$ mW</th>
<th>$T_6 \leq T_a \leq +70$ °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTDs; $P_i = 192$ mW</td>
<td>$T_6 \leq T_a \leq +70$ °C</td>
</tr>
<tr>
<td>RTDs; $P_i = 290$ mW</td>
<td>$T_6 \leq T_a \leq +60$ °C</td>
</tr>
</tbody>
</table>

### N1 ATEX Type n
Certificate: BAS00ATEX3145
Standards: EN 60079-0:2012, EN 60079-15:2010
Markings: II 3 G Ex nA IIC T5 Gc ($-40 \leq T_a \leq +70$ °C)

### ND ATEX Dust
Certificate: FM12ATEX0065X
Markings: II 2 D Ex tb IIIC T130 °C Db ($-40 \leq T_a \leq +70$ °C)

**Specific Conditions of Use:**
1. See certificate for ambient temperature range.
2. The non-metallic label may store an electrostatic charge and become a source of ignition in Group III environments.
3. Guard the LCD display cover against impact energies greater than 4 joules.
4. Flameproof joints are not intended for repair.
5. A suitable certified Ex d or Ex tb enclosure is required to be connected to temperature probes with Enclosure option “N”.
6. Care shall be taken by the end user to ensure that the external surface temperature on the equipment and the neck of DIN Style Sensor probe does not exceed 130 °C.
7. Non-Standard Paint options may cause risk from electrostatic discharge. Avoid installations that cause electrostatic build-up painted surfaces, and only clean the painted surfaces with a damp cloth. If paint is ordered through a special option code, contact the manufacturer for more information.
International

E7   IECEx Flameproof
    Certificate: IECEx FMG 12.0022X
    Markings: Ex db IIC T6...T1 Gb, T6(-50 °C ≤ Tₐ ≤ +40 °C), T5...T1(-50 °C ≤ Tₐ ≤ +60 °C)

Specific Conditions of Use:
1.  See certificate for ambient temperature range.
2.  The non-metallic label may store an electrostatic charge and become a source of ignition in Group III environments.
3.  Guard the LCD display cover against impact energies greater than 4 joules.
4.  Flameproof joints are not intended for repair.
5.  A suitable certified Ex d or Ex tb enclosure is required to be connected to temperature probes with Enclosure option “N”.
6.  Care shall be taken by the end user to ensure that the external surface temperature on the equipment and the neck of DIN Style Sensor probe does not exceed 130 °C.
7.  Non-Standard Paint options may cause risk from electrostatic discharge. Avoid installations that cause electrostatic build-up on painted surfaces, and only clean the painted surfaces with a damp cloth. If paint is ordered through a special option code, contact the manufacturer for more information.

Brazil

E2   INMETRO Flameproof
    Certificate: UL-BR 13.0535X
    Markings: Ex db IIC T6...T1 Gb T6...T1: (–50 °C ≤ Tₐ ≤ +40 °C), T5...T1: (–50 °C ≤ Tₐ ≤ +60 °C) Ex tb IIIC T130 °C Db (–40 °C ≤ Tₐ ≤ +70 °C)

Specific Conditions of Use:
1.  See product description for ambient temperature limits and process temperature limits.
2.  The non-metallic label may store an electrostatic charge and become a source of ignition in Group III environments.
3.  Guard the LCD display cover against impact energies greater than 4 joules.
4.  Consult the manufacturer if dimensional information on the flameproof joints is necessary.
5.  A suitable certified Ex d or Ex tb enclosure is required to be connected to temperature probes with Enclosure option “N”.
6.  Care shall be taken by the end user to ensure that the external surface temperature on the equipment and the neck of DIN Style Sensor probe does not exceed 130 °C.

Japan

E4   Japan Flameproof (0065 only)
    Certificate: TC17226
    Markings: IIC T6: (–20 °C ≤ Tₐ ≤ +65 °C); Process Temperature: –20 °C to +85 °C

Specific Conditions of Use:
1.  The wiring shall be suitable for a temperature over 80 °C.
EAC – Belarus, Kazakhstan, Russia

**EM**  Technical Regulation Customs Union (EAC) Flameproof
Certificate: RU C-US.GB05.B.00289
Markings: 1Ex d IIC T6...T1 Gb X

*Specific Conditions of Use:*
1. See certificate for special conditions.

**IM**  Technical Regulation Customs Union (EAC) Intrinsic Safety
Certificate: RU C-US.GB05.B.00289
Markings: 0Ex ia IIC T6 Ga X; Ga/Gb Ex ia IIC T6 X; 1Ex ia IIC T6 Gb X

*Specific Conditions of Use:*
1. See certificate for special conditions.

Korea

**EP**  Korea Explosionproof/Flameproof
Certificate: 13-KB4BO-0560X
Markings: Ex d IIC T6...T1; T6(−50 °C ≤ Tamb ≤ +40 °C), T5...T1(−50 °C ≤ Tamb ≤ +60 °C)

*Specific Conditions of Use:*
1. See certificate.

Combinations

**KD**  Combination of E1, E5, and E6
**K1**  Combination of E1, I1, N1, and ND
**KM**  Combination of EM and IM
We,
Rosemount, Inc.
8200 Market Boulevard
Chanhassen, MN 55317-9685
USA
declare under our sole responsibility that the product,
Rosemount™ Model 65, 68, 78, 85, 183, 185, and 1067
Temperature Sensors
manufactured by,
Rosemount, Inc.
8200 Market Boulevard
Chanhassen, MN 55317-9685
USA
to which this declaration relates, is in conformity with the provisions of the European Union
Directives, including the latest amendments, as shown in the attached schedule.
Assumption of conformity is based on the application of the harmonized standards and, when
applicable or required, a European Union notified body certification, as shown in the attached
schedule.

[Signature]

Vice President of Global Quality

1-April-19

[Name]

[Date of issue]
**EU Declaration of Conformity**

No: RMD 1059 Rev. P

**ATEX Directive (2014/34/EU)**

- **FM12ATEX0065X - Flameproof Certificate**
  - Equipment Group II Category 2 G (Ex db IIC T6…T1 Gb)

- **FM12ATEX0065X - Dust Certificate**
  - Equipment Group II Category 2 D (Ex tb IIC T130°C Db)

- **BAS00ATEX3145 - Type n Certificate**
  - Equipment Group II Category 3 G (Ex na IIC T5 Gc)

- **Baseefa16ATEX0101X - Intrinsic Safety Certificate**
  - Equipment Group II Category 1 G (Ex ia IIC T5/T6 Ga)

**RoHS Directive (2011/65/EU)**

Harmonized Standard: EN 50581:2012

**ATEX Notified Bodies**

- **FM Approvals Europe Limited** [Notified Body Number: 2809]
  - One Georges Quay Plaza
  - Dublin, Ireland. D02 E440

- **SGS FIMCO OY** [Notified Body Number: 0598]
  - P.O. Box 30 (Särkiniementie 3)
  - 00211 HELSINKI
  - Finland

**ATEX Notified Body for Quality Assurance**

- **SGS FIMCO OY** [Notified Body Number: 0598]
  - P.O. Box 30 (Särkiniementie 3)
  - 00211 HELSINKI
  - Finland
### List of Rosemount 0065/0185 Parts with China RoHS Concentration above MCVs

<table>
<thead>
<tr>
<th>Part Name</th>
<th>Hazardous Substances</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>铅 (Pb)</td>
</tr>
<tr>
<td>电子组件</td>
<td>O</td>
</tr>
<tr>
<td>房体组件</td>
<td>O</td>
</tr>
<tr>
<td>传感器组件</td>
<td>O</td>
</tr>
</tbody>
</table>

本次表格依据 SJ/T11364 设定及制作。This table is proposed in accordance with the provision of SJ/T11364.

O: 意为该组件的所有均质材料中该有害物质的含量均低于 GB/T 26572 所规定的限量要求。O: Indicate that said hazardous substance in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.

X: 意为该组件所使用的所有均质材料中，至少有一类均质材料中该有害物质的含量高于 GB/T 26572 所规定的限量要求。X: Indicate that said hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.