Rosemount™ Volume 1 Sensor Assembly
NOTICE

This guide provides basic guidelines for Rosemount 0068, 0078, and 0183 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 Volume 1 Sensor was ordered assembled to a temperature transmitter, see the appropriate transmitter Quick Start Guide for information on configuration and hazardous locations certifications.

1.0 Wiring diagrams

Figure 1. Rosemount Series 68, 68Q, 78, and 58C RTD Wire Colors

*Single element*

1. Red
2. White
3. Green
4. Black

*Dual element (1)*

1. Red
2. White
3. Green
4. Black
5. A
6. B
7. C
8. D

1. Dual element sensors are only available on Rosemount Series 68Q and 78 Sensors.

Note

For three-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 two-wire systems, connect both sets of leads.
2.0 Rosemount Series 58C sheath cutting

1. Determine the length to which the sheath will be cut. The finished length needs to include an additional 1.5-in. for compression fittings, or 2.5-in, for spring-loaded fittings (see Figure 2).

2. Remove and save the heat shrink tubing from the rear of the sensor.

3. Place the sensor in a vise, taking care not to overtighten, and position the tubing cutter on the sheath.

4. Score the sheath to a depth of approximately 1/64-in. To prevent damage to the lead wire insulation, do not cut completely through the sheath.

5. Firmly grasp the end of the sheath with your hand or a pair of pliers. Using a sharp snapping motion, break off and remove the excess sheath material. Take care not to strip or damage the lead wire insulation while removing the excess sheath material.

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**Note**

If you are unable to easily break off excess sheath material, deepen the score and repeat Step 5.

6. Replace the heat shrink tubing.

3.0 Drawings

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**Figure 2. Rosemount Series 58C Sensor**

A. Four lead wires 6 (152) long
B. X length ±0.25 (±6)
C. 0.25 ±0.002 (6.35 ±0.13) diameter
D. Heat shrink tubing
E. Do not cut or bend sheath within 2 (51)
F. 0.6 (15) max. sensing element
Figure 3. Rosemount Series 183 Thermocouple Wire Colors

A. White
B. Red
C. Purple
D. Yellow
E. Blue

Table 1. Rosemount Series 183 Thermocouple Characteristics

<table>
<thead>
<tr>
<th>Thermocouple types</th>
<th>Thermocouple wire alloys</th>
<th>Temperature range</th>
<th>Limits of error (interchangeability)</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
<td>Iron/constantan</td>
<td>0 to 760 °C / 32 to 1400 °F</td>
<td>±1.1 °C (2.0 °F) or ±0.4% of measured temperature, whichever is greater</td>
</tr>
<tr>
<td>K</td>
<td>Chromel®/Alumel®</td>
<td>0 to 1150 °C / 32 to 2102 °F</td>
<td>±1.1 °C (2.0 °F) or ±0.4% of measured temperature, whichever is greater</td>
</tr>
<tr>
<td>E</td>
<td>Chromel/constantan</td>
<td>0 to 871 °C / 32 to 1600 °F</td>
<td>±1.0 °C (1.8 °F) or ±0.4% of measured temperature, whichever is greater</td>
</tr>
<tr>
<td>T</td>
<td>Copper/constantan</td>
<td>–180 to 0 °C / –292 to 32 °F</td>
<td>±1.0 °C (1.8 °F) or ±1.5% of measured temperature, whichever is greater</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 to 371 °C / 32 to 700 °F</td>
<td>±0.5 °C (1.0 °F) or ±0.4% of measured temperature, whichever is greater</td>
</tr>
</tbody>
</table>

Note
To distinguish the two sensors in dual Rosemount 183 Sensors, there is an outer insulation wrapped around each pair of sensor wires.
Figure 4. Sensor Assembly

A. Open identification tag
B. Standard adapter sensor assembly
C. Sensor immersion length “X”
D. 0.5-in. (13 mm) nominal engagement
E. Coupling-nipple
F. Extension length
G. Overall thermowell length
H. Lead wire extensions and seals
I. 0.5-in. (13 mm) nominal engagement
J. Extensions
K. Union-nipple
L. Flat or extended cover aluminum connection heads
M. Threaded Thermowell
N. Thermowells
O. T + 1.75-in. (44.5 mm)
P. Socket weld thermowell
Q. Polypropylene connection head
R. Thermowell immersion length
S. Flanged thermowell
T. Rosemount aluminum connection head

Note
Sensor assemblies can be provided without an enclosure or with an enclosure such as the connection heads shown above or assembled to a Rosemount transmitter.
4.0 Product certifications

4.1 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.

4.2 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).

4.3 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

North America

E5 FM Explosion proof, 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 ≤ Ta ≤ 85 °C); when installed per Rosemount drawing 00068-0013; Type 4X

Canada

E6 CSA Explosion proof and Dust-Ignition proof
Certificate: 1063635
Standards: CSA C22.2 No. 0-M91; CSA C22.2 No. 25-1966; CSA C22.2 No. 30-M1986; CSA C22.2 No. 94-M91; CSA C22.2 No. 142-M1987; CSA C22.2 No. 213-M1987
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 ≤ Ta ≤ 85 °C); when installed per Rosemount drawing 00068-0033; Type 4X (Spring loaded sensors must be installed in a thermowell to maintain Type 4X and Cl. II/III rating)

Europe

E1 ATEX Flameproof
Certificate: FM12ATEX0065X
Markings: II 2 G Ex db IIC T6...T1 Gb, T6(–50 °C ≤ Ta ≤ +40 °C), T5...T1(−50 °C ≤ Ta ≤ +60 °C)
Specific Conditions of Use (X):
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.

International
E7 IECEx Flameproof
Certificate: IECEx FMG 12.0022X
Markings: Ex db IIC T6…T1 Gb, T6(–50 °C ≤ T_a ≤ +40 °C), T5…T1(–50 °C ≤ T_a ≤ +60 °C)

Specific Conditions of Use (X):
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.

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

Special Conditions for Safe Use (X):
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. A suitable certified Ex d or Ex tb enclosure is required to be connected to temperature probes with Enclosure option "N".
5. 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.
6. Consult the manufacturer if dimensional information on the flameproof joints is necessary.
**EAC**  
EM Technical Regulations Customs Union (EAC) Flameproof  
Certificate: RU C-U5.Gb05.B.00289  
Markings: 1Ex d IIC T6...T1 Gb X

**Korea**  
EP Korea Explosionproof/Flameproof  
Certificate: 13-KB48O-0560X  
Markings: Ex d IIC T6...T1; T6(−50 °C ≤ Tamb ≤ +40 °C), T5...T1(−50 °C ≤ Tamb ≤ +60 °C)

Special Condition for Safe Use (X):  
1. See certificate.

**Combinations**  
KF Combination of E1 and E6  
KD Combination of E5, E6, and E1
Figure 5. Rosemount Series 68, 68Q, 78, and 58C Declaration of Conformity

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

Chris LaPoint
(name)
1-April-19
(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)
Harmonized Standards:

FM12ATEX0065X - Dust Certificate
Equipment Group II Category 2 D (Ex db IIC T130°C D8)
Harmonized Standards:

BA500ATEX3145 - Type n Certificate
Equipment Group II Category 3 G (Ex nA IIC T5 Gc)
Harmonized Standards:

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

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 (Särkinenmietie 5)
00211 HELSINKI
Finland

ATEX Notified Body for Quality Assurance

SGS FIMCO OY [Notified Body Number: 0598]
P.O. Box 30 (Särkinenmietie 5)
00211 HELSINKI
Finland
### List of Rosemount 68/78/183 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>Lead (Pb)</td>
</tr>
<tr>
<td>Electronics Assembly</td>
<td>O</td>
</tr>
<tr>
<td>Housing Assembly</td>
<td>O</td>
</tr>
<tr>
<td>Sensor Assembly</td>
<td>O</td>
</tr>
</tbody>
</table>

This table is proposed in accordance with the provision of SJ/T11364.

O: 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.

X: Indicate that said hazardous substance in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.