Reference Manual
00809-0100-4952, Rev BA
February 2014

Rosemount Pipe Clamp Sensor

ROSEMOUNT®

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Process Management

The Rosemount 0085 Pipe Clamp Sensor

NOTICE

Read this manual before working with the product. For personal and system safety, and for optimum product performance, make sure you thoroughly understand the contents before installing, using, or maintaining this product.

The United States has two toll-free assistance numbers and one International number.

Customer Central
1-800-999-9307 (7:00 A.M. to 7:00 P.M. CST)

International
1-(952) 906-8888

National Response Center
1-800-654-7768 (24 hours a day)
Equipment service needs

⚠ CAUTION

The products described in this document are NOT designed for nuclear-qualified applications. Using non-nuclear qualified products in applications that require nuclear-qualified hardware or products may cause inaccurate readings.

For information on Rosemount nuclear-qualified products, contact your local Emerson Process Management Sales Representative.

This device is intended for use in temperature monitoring applications and should not be used in control and safety applications.

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Section 1 Introduction

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1.1 Using this manual

This product manual provides installation, configuration, troubleshooting, and maintenance instructions for the 0085 Pipe Clamp Sensor.

Section 2: Installation

- Installation flowchart and checklist
- Mounting and installation
- Wiring to transmitter/connection head

Section 3: Operation and maintenance

- Troubleshooting
- Replaceable insert maintenance

Appendix A: Reference data

- Specifications
- Dimensional drawings

Appendix B: Product Certifications

- Product Certifications
- Installation Drawings

1.2 Receiving and inspection

The 0085 Pipe Clamp Sensor comes in several different types of materials and clamp sizes so it's important to inspect and verify that the appropriate model was delivered before installation.

Upon receipt of the shipment, check the packing list against the material received and the purchase order. Report any damage to the carrier.

1.3 Returning the product

To expedite the return process, call the Rosemount National Response Center toll-free at 800-654-7768. This center, available 24 hours a day, will assist you with any needed information or materials.

⚠ The center will ask for the following information:

- Product model
- Serial numbers
- The last process material to which the product was exposed

The center will provide:

- A Return Material Authorization (RMA) number
- Instructions and procedures that are necessary to return goods that were exposed to hazardous substances

Note
If a hazardous substance is identified, a Material Safety Data Sheet (MSDS), required by law to be available to people exposed to specific hazardous substances, must be included with the returned materials.

1.4 Considerations

Information in this manual applies to circular pipes only. Consult Rosemount Customer Central for instruction regarding other uses.

1.4.1 Limitations

Functional

The most accurate and repeatable surface temperature measurement occurs with the following insulation best practices:

- Use weather proof insulation with aluminum cladding
- Install insulation extending at least 0.5 meters in each direction from sensor (at least 1 meter total)
- Insulate the sensor extension
- Install insulation with minimal gaps to isolate sensor as much as possible from ambient conditions.

Section 2 Installation

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2.1 Safety messages

Instructions and procedures in this section may require special precautions to ensure the safety of the personnel performing the operations. Please refer to the following safety messages before performing any operation in this section.

⚠ WARNING

Explosions could result in death or serious injury:

- Do not remove the housing cover in explosive atmospheres when the circuit is live.
- Before connecting a Field Communicator in an explosive atmosphere, make sure the instruments in the loop are installed in accordance with intrinsically safe or non-incendive field wiring practices.
- Verify that the operating atmosphere of the sensor is consistent with the appropriate hazardous locations certifications.
- Housing cover must be fully engaged to meet explosion-proof requirements.

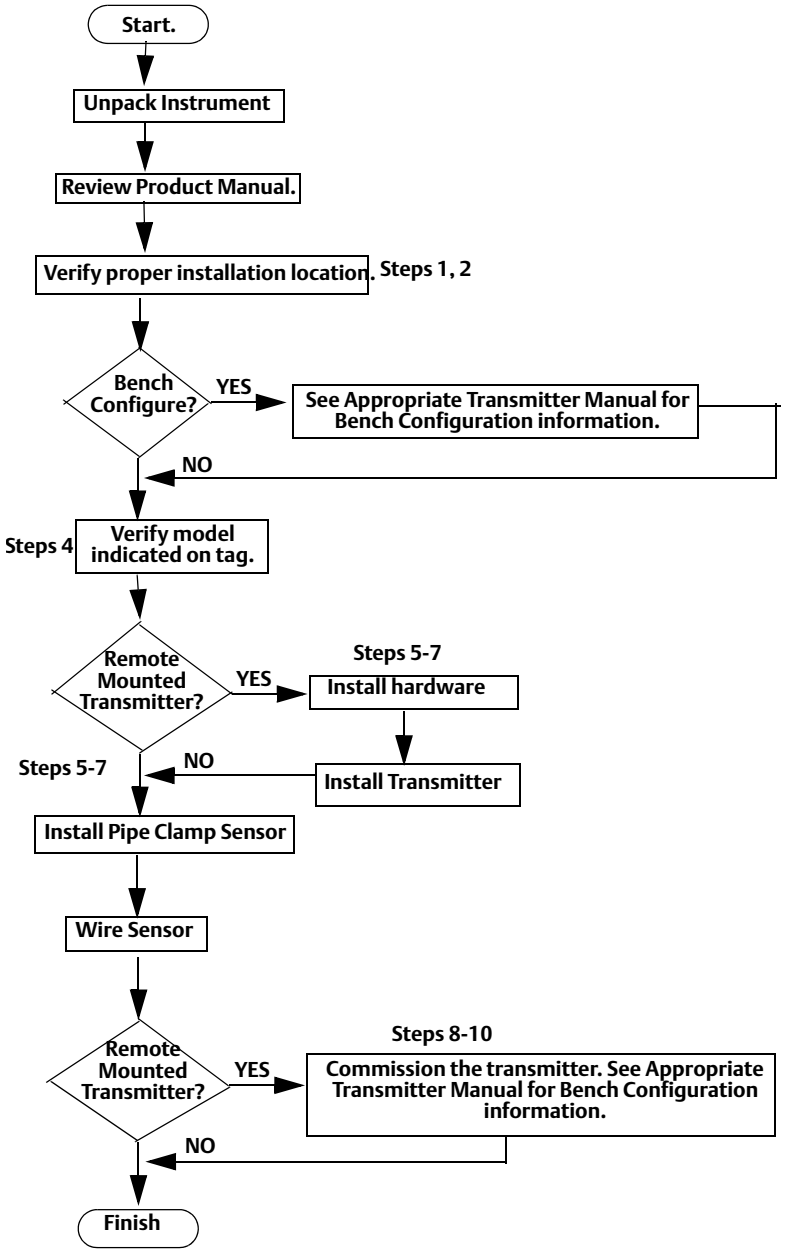
Failure to follow these installation guidelines could result in death or serious injury:

- Make sure only qualified personnel perform the installation.

2.2 Installation flowchart and checklist

Figure 2-1 is an installation flowchart that provides guidance through the installation process. Following the figure, an installation checklist has been provided to verify that all critical steps have been taken in the installation process. The checklist numbers are indicated in the flowchart.

Figure 2-1. Installation Chart



The following list is a summary of the steps required to complete a Pipe Clamp Sensor installation.

1. Determine where the Pipe Clamp Sensor is to be placed within the piping system.
2. Establish the proper orientation as determined by the intended application.
3. Confirm the configuration.
4. Mount the sensor and tighten the clamp bolts.
5. Check the fit-up of the instrument assembly to the pipe.
6. Check for full contact between RTD sensor tip and pipe.
7. Wire the instrument.
8. Supply power to the transmitter.
9. Commission the instrument.

2.3 Mounting

2.3.1 Tools and supplies

Tools required include the following:

- Open end or combination wrenches.
- Adjustable wrench: 40mm (1½-in.) jaw.

Supplies required include the following:

- Pipe compound or PTFE tape (where local piping codes allow).

2.4 Installation

Step 1: determine the proper orientation

The Pipe Clamp Sensor should be mounted in a secure position to ensure there is no rotational movement after installation. The mounting best practice is to install the sensor vertically.

Step 2: install the pipe clamp sensor

Mount the Pipe Clamp Sensor and tighten the bolts.

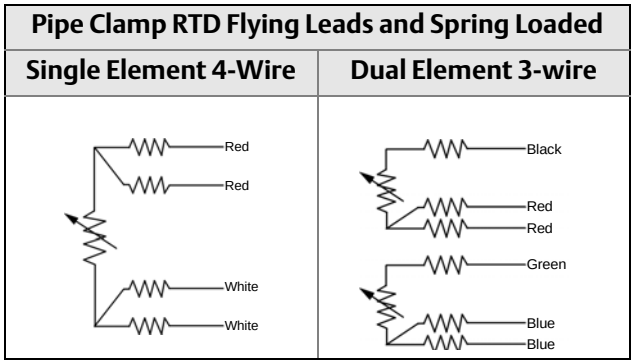
Step 3: install the transmitter

See appropriate transmitter product manual for sensor-transmitter installation.

Step 4: commission the transmitter

See appropriate transmitter product manual for transmitter commissioning instructions.

Figure 2-2. Sensor Lead Wire Termination



Section 3 Operation and maintenance

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3.1 Safety messages

Instructions and procedures in this section may require special precautions to ensure the safety of the personnel performing the operations. Please refer to the following safety messages before performing any operation in this section.

⚠ WARNING

Explosions could result in death or serious injury:

- Do not remove the housing cover in explosive atmospheres when the circuit is live.
- Housing cover must be fully engaged to meet explosion-proof requirements.
- Before connecting a communicator in an explosive atmosphere, make sure the instruments in the loop are installed in accordance with intrinsically safe or nonincendive field wiring practices.

Electrical shock can result in death or serious injury.

- Avoid contact with the leads and the terminals.

3.2 Troubleshooting

If a malfunction is suspected despite the absence of a diagnostic message on the communicator display, follow the procedures described below to verify that the Pipe Clamp Sensor, transmitter, and process connections are in good working order. Always approach the most likely and easiest-to-check conditions first.

Symptom	Possible source	Corrective action
Transmitter Does Not Communicate with Field Communicator	Loop Wiring	• Check the revision level of the transmitter device descriptors (DDs) stored in your communicator. The communicator should report Dev v4, DD v1 (improved), or reference "Field Communicator" for previous versions. Contact Emerson Process Management Customer Central for assistance. • Check for a minimum of 250 ohms resistance between the power supply and Field Communicator connection. • Check for adequate voltage to the transmitter. If a Field Communicator is connected and 250 ohms resistance is properly in the loop, then the transmitter requires a minimum of 12.0 V at the terminals to operate (over entire 3.5 to 23.0 mA operating range), and 12.5 V minimum to communicate digitally. • Check for intermittent shorts, open circuits, and multiple grounds.
High Output	Sensor Input Failure or Connection	• Connect a Field Communicator and enter the transmitter test mode to isolate a sensor failure. • Check for a sensor open circuit. • Check if the process variable is out of range.
	Loop Wiring	• Check for dirty or defective terminals, interconnecting pins, or receptacles.
	Power Supply	• Check the output voltage of the power supply at the transmitter terminals. It should be 12.0 to 42.4 Vdc (over entire 3.5 to 23.0 mA operating range).
	Electronics Module	• Connect a Field Communicator and enter the transmitter test mode to isolate module failure. • Connect a Field Communicator and check the sensor limits to ensure calibration adjustments are within the sensor range.
Erratic Output	Loop Wiring	• Check for adequate voltage to the transmitter. It should be 12.0 to 42.4 Vdc at the transmitter terminals (over entire 3.5 to 23.0 mA operating range). • Check for intermittent shorts, open circuits, and multiple grounds. • Connect a Field Communicator and enter the loop test mode to generate signals of 4 mA, 20 mA, and user-selected values.
	Electronics Module	• Connect a Field Communicator and enter the transmitter test ode to isolate module failure.
Low Output or No Output	Sensor Element	• Connect a Field Communicator and enter the transmitter test mode to isolate module failure. • Check if the process variable is out of range.
	Loop Wiring	• Check for adequate voltage to the transmitter. It should be 12.0 to 42.4 Vdc at the transmitter terminals (over entire 3.5 to 23.0 mA operating range). • Check for shorts and multiple grounds. • Check for proper polarity at the signal terminal. • Check the loop impedance. • Connect a Field Communicator and enter the loop test mode. • Check wire insulation to detect possible shorts to ground.
	Electronics Module	• Connect a Field Communicator and check the sensor limits to ensure calibration adjustments are within the sensor range. • Connect a Field Communicator and enter the transmitter test mode to isolate an electronic module failure.

Appendix A Reference data

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A.1 Rosemount Pipe Clamp Sensor ordering information

Table A-1. Rosemount Pipe Clamp Sensor Ordering Table

★ 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			
Standard				**Standard**
0085	Non Intrusive Pipe Clamp Sensor			★
Code	**Connection head**	**IP Rating**	**Conduit entry**	
Standard				**Standard**
C	Connection Head Rosemount, Aluminum	66/68	M20 x 1.5	★
D	Connection Head Rosemount, Aluminum	66/68	1/2 in. NPT	★
G	Connection Head Rosemount, Stainless Steel	66/68	M20 x 1.5	★
H	Connection Head Rosemount, Stainless Steel	66/68	1/2 in. NPT	★
N	No connection head	66/68		★
1	Connection Head Rosemount, Aluminum with LCD display cover	66/68	M20 x 1.5	★
2	Connection Head Rosemount, Aluminum with LCD display cover	66/68	1/2 in. NPT	★
3	Connection Head Rosemount, Stainless Steel with LCD display cover	66/68	M20 x 1.5	★
4	Connection Head Rosemount, Stainless Steel with LCD display cover	66/68	1/2 in. NPT	★
Code	**Sensor connection**			
Standard				**Standard**
3	Spring Loaded Adapter			★
5	Spring Loaded Adapter with Terminal Block			★
Code	**Sensor type**	**Temperature range**		
Standard				**Standard**
P1	RTD, Single Element, 4-Wire, Silver tip	-50 to 300 °C (-58 to 572 °F)		★
P2	RTD, Dual Element, 3-Wire, Silver tip	-50 to 300 °C (-58 to 572 °F)		★
P3	RTD, Single Element, 4 Wire, Nickel tip	-200 to 300 °C (-328 to 572 °F)		★
P4	RTD, Dual Element, 3 Wire, Nickel tip	-200 to 300 °C (-328 to 572 °F)		★
Code	**Extension type**	**Head connection**	**Instrument connection**	**Material**
Standard				**Standard**
J	Nipple -Union	None	1/2 in. NPT	Stainless steel	★
Code	**Extension length (N) in mm**			
Standard				**Standard**
0080	80 mm			★
0150	150 mm			★
Expanded				
XXXX	Non Standard lengths 200 - 500 mm - Available in 50 mm increments			

Table A-1. Rosemount Pipe Clamp Sensor Ordering Table

★ 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.

Code	Pipe clamp material				
Standard					**Standard**
P	ASTM 304 SST (1.4301)				★
Expanded					
B	Duplex F51 (1.4462)				
Code	**Inner diameter (D)**	**Suitable pipe size inch**	**Suitable pipe size DIN**	**Clamp/bolt dimensions**	
Standard					**Standard**
0022	22 mm	1/2 in.	DN15	30 x 5 mm, M10	★
0034	34 mm	1 in.	DN25	30 x 5 mm, M10	★
0061	61 mm	2 in.	DN50	40 x 6 mm, M12	★
0089	89 mm	3 in.	DN80	40 x 6 mm, M12	★
0115	115 mm	4 in.	DN100	50 x 8 mm, M16	★
0140	140 mm	5 in.	DN125	50 x 8 mm, M16	★
0169	169 mm	6 in.	DN150	50 x 8 mm, M16	★
0220	220 mm	8 in.	DN200	50 x 8 mm, M16	★
0273	273 mm	10 in.	DN250	60 x 8 mm, M20	★
Expanded					
0027	27 mm	3/4 in.	DN20	30 x 5 mm, M10	
0030	30 mm		DN25	30 x 5 mm, M10	
0043	43 mm	1 1/4 in.	DN32	30 x 5 mm, M10	
0049	49 mm	1 1/2 in.	DN40	30 x 5 mm, M10	
0077	77 mm	2 1/2 in.	DN65	40 x 6 mm, M12	
0159	159 mm		DN150	50 x 8 mm, M16	
0306	306 mm			60 x 8 mm, M20	
0324	324 mm	12 in.	DN300	60 x 8 mm, M20	
0356	356 mm	14 in.	DN350	60 x 8 mm, M20	
0368	368 mm		DN350	60 x 8 mm, M20	
0407	407 mm	16 in.	DN400	60 x 8 mm, M20	
0458	458 mm	18 in.	DN450	70 x 10 mm, M24	
0508	508 mm	20 in.	DN500	70 x 10 mm, M24	
0521	521 mm		DN500	70 x 10 mm, M24	
0610	610 mm	24 in.	DN600	70 x 10 mm, M24	
0660	660 mm	26 in.		70 x 10 mm, M24	
0720	720 mm			70 x 10 mm, M24	
0762	762 mm	30 in.	DN790	70 x 10 mm, M24	
0813	813 mm	32 in.	DN900	70 x 10 mm, M24	
0915	915 mm	36 in.	DN1000	70 x 10 mm, M24	
1016	1016 mm	40 in.		70 x 10 mm, M24	
1070	1070 mm	42 in.		70 x 10 mm, M24	
1219	1219 mm	48 in.		70 x 10 mm, M24	
Code	**Corrosion protection inlay**				
Standard					**Standard**
N	None				★
Expanded					
A	Material NBR				

Table A-1. Rosemount Pipe Clamp Sensor Ordering Table

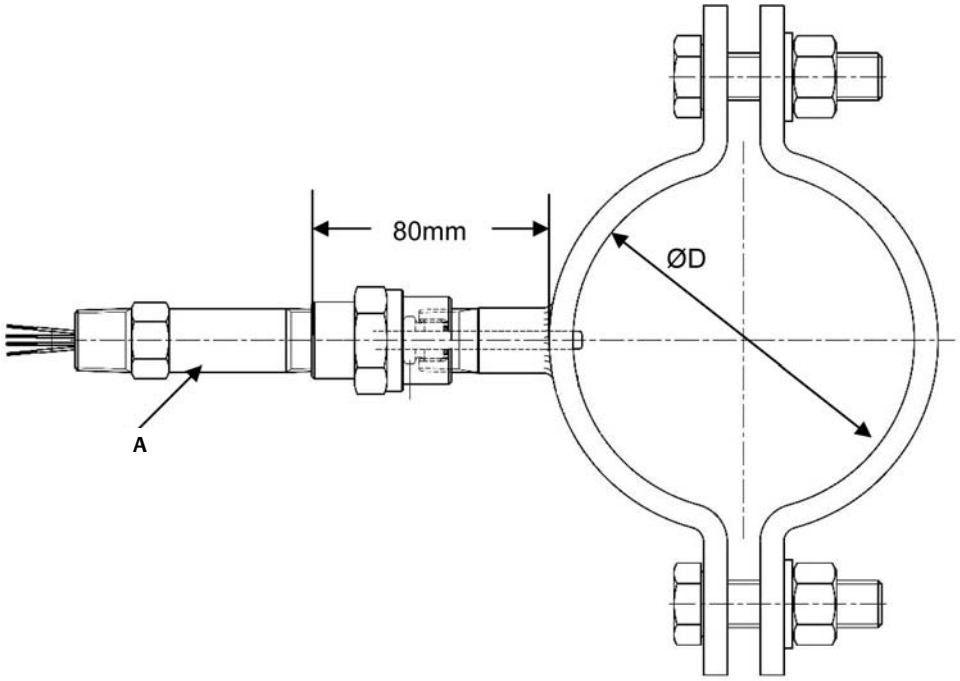
★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.
__The Expanded offering is subject to additional delivery lead time.

Options (include with selected model number)

Code	Sensor options	
Standard		**Standard**
A1	Single Element Class A Sensor from -50 to 300 °C (-58 to 572 °F)	★
A2	Dual Element Class A Sensor from -50 to 300 °C (-58 to 572 °F)	★
Code	**Assemble to option**	
Standard		**Standard**
XA	Assemble Sensor to Specific Temperature Transmitter	★
Code	**Cable gland options**	
Standard		**Standard**
G2	Cable Gland, Ex d, Brass, 7.5-11.9 mm	★
G7	Cable Gland, M20x1.5, Ex e, Blue, Polyamide, Diam 5-9 mm	★
Code	**Product certifications**	
Standard		**Standard**
E1	ATEX Flameproof	★
E7	IECEx Flameproof and Dust	★
E5	FM Explosion-proof	★
E6	CSA Explosion-proof	★
Code	**Cover chain option**	
Standard		**Standard**
G3	Cover Chain - only available with Rosemount Connection Head Material Codes C, D, G, and H	★
Code	**Product certifications**	
Standard		**Standard**
LT	Special Material to meet extended Temperature rage of -51 Deg C	★

A.1.1 Design example drawings

Figure A-1. Pipe Clamp Sensor Assembly



A. 1/2-in. NPT Spring loaded adapter

Appendix B Product Certifications

Approved manufacturing locations . . . . . page 13
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B.1 Approved manufacturing locations

Emerson Process Management Rosemount Division. – Chanhassen, MN

Emerson Process Management Asia Pacific Limited – Singapore

Emerson Process Management GmbH & Co. - Karlstein, Germany

Emerson Process Management (India) Private Ltd. – Mumbai, India

Emerson Process Management Brazil - Sorocaba, Brazil

Emerson Process Management, Dubai - Emerson FZE

Beijing Rosemount Far East Instrument Co., Limited. - Beijing, China

B.2 European Directive Information

A copy of the EC Declaration of Conformity can be found at the end of the Quick Start Guide. The most recent revision of the EC Declaration of Conformity can be found at www.rosemount.com.

B.2.1 Ordinary Location Certification from FM Approvals

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).

B.2.2 Hazardous Locations Certifications

North America

E5 FM Explosionproof and Dust-Ignitionproof
Certificate: 0R7A2.AE
Standards Used: FM Class 3600- 2011, FM Class 3615 - 2006, FM Class 3810 - 2005 ANSI/NEMA 250 - 1991
Markings: **XP** CL I, DIV 1, GP B, C, D, T6; **DIP** CL II / III, DIV 1, GP E, F, G, T6; Type 4X; Installed per 00068-0013;

E6 CSA Explosionproof, Dust-Ignitionproof and Division 2
Certificate:1063635
Standards Used: CAN/CSA C22.2 No. 0-M91, CSA Std. C22.2 No. 25-1966, CSA Std. C22.2 No. 30-M1986, CSA Std. C22.2 No.94-M91, CSA Std. C22.2 No. 142-M1987, CSA Std. C22.2 No. 213-M1987
Markings: XP Class I Groups B, C, and D; DIP Class II Groups E, F, G; Class III; Class I Div. 2 Groups A, B, C, D; Class I Zone 1 Group IIB+H2; Class I Zone 2 Group IIC; Installed per 00068-0033;

Europe

E1 ATEX Flameproof
Certificate: FM12ATEX0065X
Standards Used: EN60079-0:2012, EN60079-1:2007
Markings: ⟨Ex⟩ II 2 G Ex d IIC T6...T1 Gb

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. Consult the manufacturer if dimensional information on the flameproof joints is necessary.

International

E7 IECEX Flameproof
Certificate: IECEx FMG 12.0022X
Standards Used: IEC60079-0:2011, IEC60079-1:2007
Markings: Ex d IIC T6...T1 Gb

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. Consult the manufacturer if dimensional information on the flameproof joints is necessary.

B.3 Installation drawings

Figure B-1. FM Explosionproof Temperature Measurement Assembly (E5) Installation Drawing 00068-0013, Rev AG.

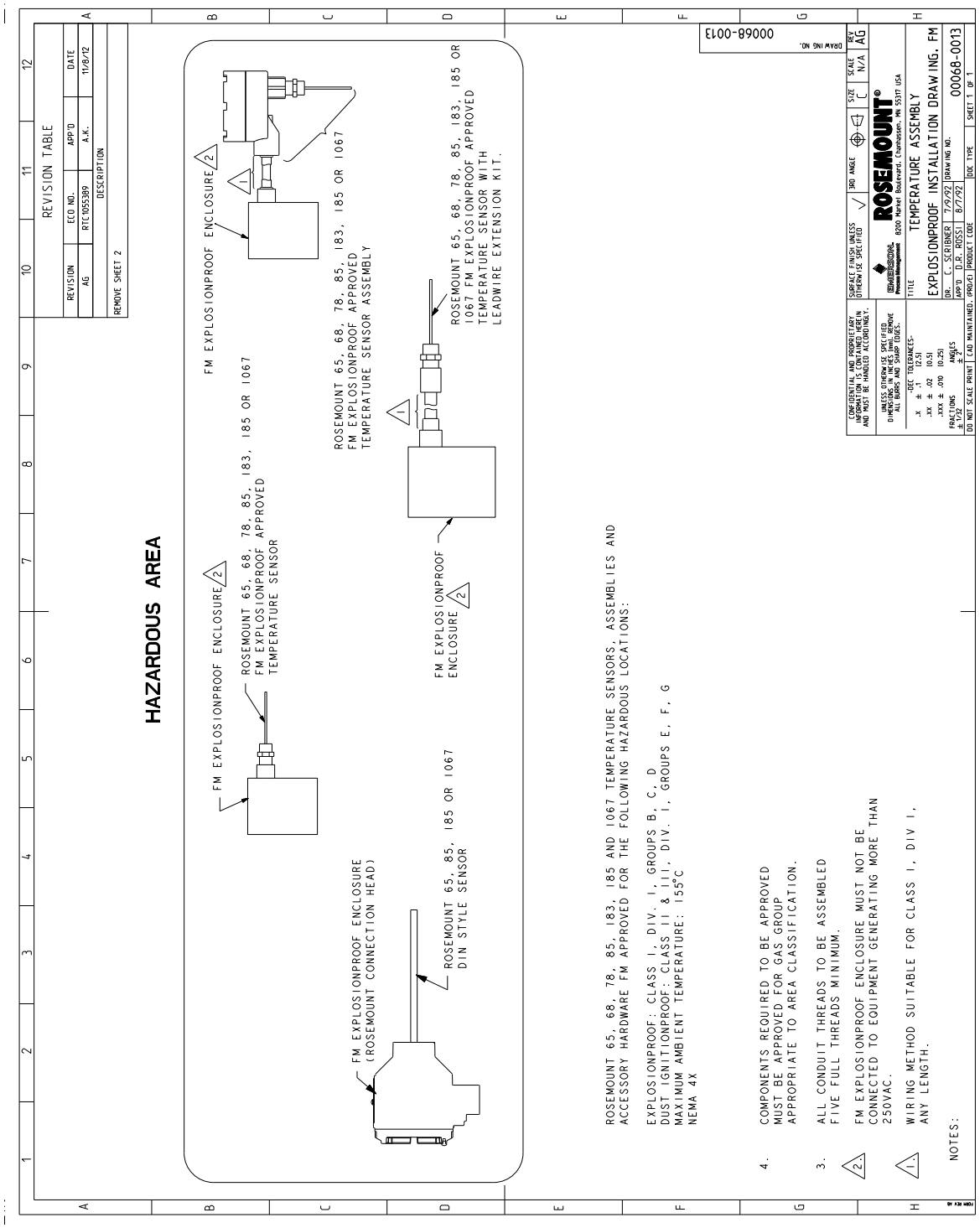
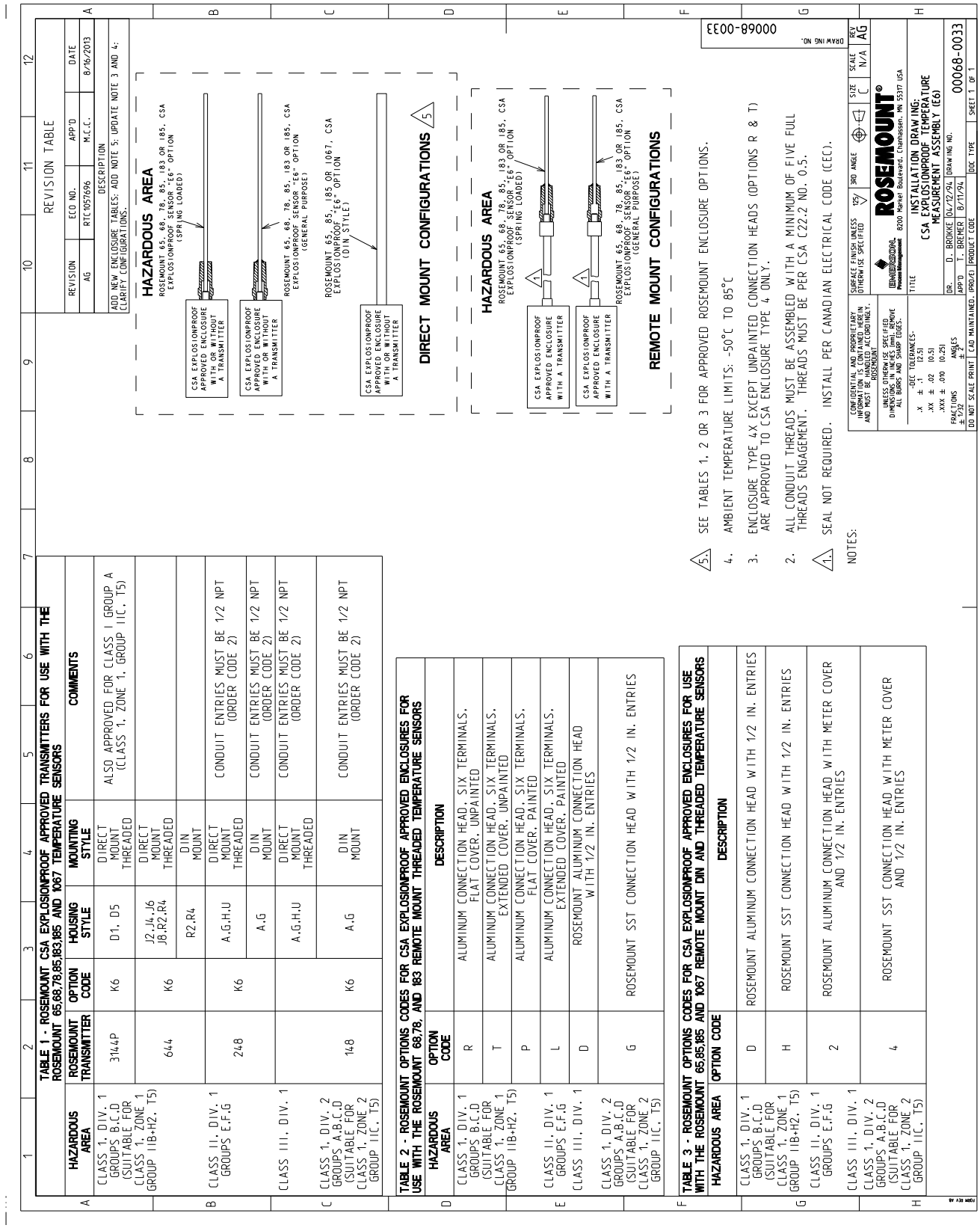


Figure B-2. CSA Explosionproof Temperature Measurement Assembly (E6) Installation Drawing 00068-0033, Rev AG.



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