

# Rosemount™ 0085 Pipe Clamp Sensor



- Direct mount assembly with Rosemount 3144P Temperature Transmitter or Rosemount 648 Wireless Temperature Transmitter with Rosemount X-well™ Technology provides accurate process temperature without the requirement of a thermowell or process penetration
- Non-intrusive design for fast and easy temperature measurement in piping applications
- Platinum RTD temperature sensors with silver tip
- Integrated temperature assemblies provide time and cost savings

## Features and benefits

**Rosemount X-well Technology provides a Complete Point Solution™ for accurately measuring process temperature without the requirement of a thermowell or process penetration.**



- Simplify temperature measurement point specification, installation and maintenance, and eliminate possible leak points
- Calculates a repeatable and accurate process temperature measurement via an in-transmitter thermal conductivity algorithm
- Measures pipe surface and ambient temperature, and utilizes the thermal conductivity properties of the installation and process piping in order to provide an accurate process measurement

## Proven pipe clamp sensors deliver excellent performance and reliability



- Superior accuracy and stability
- Improved response time with silver tip

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## Easy implementation and installation in existing application

- Available in a wide variety of pipe sizes and materials
- Installation requires no welding
- Optimized surface contact by spring loaded sensor design

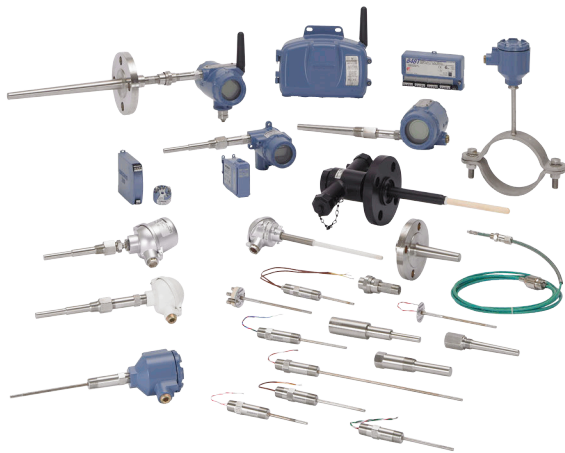
## Minimized risk of sensor failure and unplanned shutdowns

- Avoids stresses related to flow, pressure, chemical contact, abrasion, vibration, and bending
- Maintenance of sensor without shutdown of process

## Achieve optimal efficiency with Rosemount wireless transmitter offering

- Measure your temperature anywhere

## Explore the benefits of Complete Point Solutions from Rosemount Temperature Measurement



- An “Assemble to 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, high density, and wireless 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



- 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

## Ordering information



Universal Pipe Mount



Pipe Clamp

The Rosemount 0085 Pipe Clamp Sensor is designed for fast and easy non-intrusive surface temperature measurements in piping applications.

Features include:

- Temperature range of -58 to 572 °F (-50 to 300 °C)
- Suitable for pipe sizes ½ to 60 in. (22 to 1,524 mm)
- Single or Dual Element Class A Sensor
- Assemble-to-transmitter Option

<a href="#" style="color: white; text-decoration: none;">CONFIGURE &gt;</a>	<a href="#" style="color: black; text-decoration: none;">VIEW PRODUCT &gt;</a>
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## Online product configurator

Many products are configurable online using our product configurator.

Select the **Configure** button or visit [Emerson.com/global](https://emerson.com/global) to start. With this tool's built-in logic and continuous validation, you can configure your products more quickly and accurately.

## Model codes

Model codes contain the details related to each product. Exact model codes will vary. An example of a typical model code is shown in [Figure 1](#).

Figure 1: Model code example

<b>3144P D1 A 1 NA</b>	<b>M5 DA1 Q4</b>
1	2

1. Required model components (choices available on most)
2. Additional options (variety of features and functions that may be added to products)

## Specifications and options

The purchaser of the equipment must specify and select the product materials, options, or components.

## 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.

## Required model components

### Model

Code	Description	
0085	Non Intrusive Pipe Clamp Sensor	★

### Connection head

Code	Connection head	IP rating	Conduit entry	
C	Rosemount, aluminum	68	M20 x 1.5	★
D	Rosemount, aluminum	68	½-in. NPT	★
G	Rosemount, stainless steel	68	M20 x 1.5	★
H	Rosemount, stainless steel	68	½-in. NPT	★
N	No connection head	N/A	N/A	★
1	Rosemount, aluminum with LCD display cover	68	M20 x 1.5	★
2	Rosemount, aluminum with LCD display cover	68	½-in. NPT	★
3	Rosemount, stainless steel with LCD display cover	68	M20 x 1.5	★
4	Rosemount, stainless steel with LCD display cover	68	½-in.NPT	★

### Sensor connection

Code	Description	
3	Spring-loaded adapter	★
5	Spring-loaded adapter with terminal block	★

### Sensor type

Code	Description	Temperature range	
P1	RTD, single element, 4-wire, silver tip	-58 to 572 °F (-50 to 300 °C)	★
P2	RTD, dual element, 3-wire, silver tip	-58 to 572 °F (-50 to 300 °C)	★

### Extension type

Code	Extension type	Head connection	Instrument connection	Material	
J	Nipple-union	None	½-in. NPT	Stainless steel	★
N	No extension (sensor-only option)				★

### Extension length (N)

Code	Description	
0080	3.1 in. (80 mm)	★
0150	5.9 in. (150 mm)	★

Code	Description
XXXX	Non standard lengths 7.8 in. - 19.6 in. (200 mm – 500 mm). Available in 1.9 in. (50 mm) increments.

**Pipe clamp material**

Code	Description		
	Pipe Clamp Style	Material	
N	No clamp (sensor only option)	N/A	★
U	Universal Pipe Mount	1.4401 (ASTM 316)	★
P	Pipe Clamp	1.4301 (ASTM 304)	★
B	Pipe Clamp	1.4462 (Duplex F51)	
C	Pipe Clamp	1.0037 (Carbon Steel)	
S	Pipe Clamp	1.4401 (ASTM 316)	

**Inner diameter (D)**

When selecting this option in regards to Rosemount X-well Technology, refer to [How to order Rosemount X-well Technology](#).

Code	Diameter	Suitable pipe sizes				Clamp/bolt dimensions	
		Inches	DIN	Millimeters			
				Min. OD	Max. OD		
0022	0.8 in. (22 mm)	½	DN15	19	24	35 x 5 mm, M10	★
0027	1 in. (27 mm)	¾	DN20	24	27	35 x 5 mm, M10	★
0030	1.1 in. (30 mm)	N/A	DN25	27	31	35 x 5 mm, M10	
0034	1.3 in. (34 mm)	1	DN25	31	35	35 x 5 mm, M10	★
0043	1.6 in. (43 mm)	1¼	DN32	40	46	35 x 5 mm, M10	
0049	1.9 in. (49 mm)	1½	DN40	46	50	35 x 5 mm, M10	★
0061	2.4 in. (61 mm)	2	DN50	58	68	50 x 6 mm, M12	★
0077	3 in. (77 mm)	2½	DN65	74	86	50 x 6 mm, M12	
0089	3.5 in. (89 mm)	3	DN80	86	96	50 x 6 mm, M12	★
0115	4.5 in. (115 mm)	4	DN100	112	120	60 x 8 mm, M16	★
0140	5.5 in. (140 mm)	5	DN125	137	144	60 x 8 mm, M16	★
0159	6.2 in. (159 mm)	N/A	DN150	156	162	60 x 8 mm, M16	
0169	6.6 in. (169 mm)	6	DN150	166	172	60 x 8 mm, M16	★
0220	8.6 in. (220 mm)	8	DN200	217	223	60 x 8 mm, M16	★
0273	10.7 in. (273 mm)	10	DN250	269	278	70 x 8 mm, M20	
0306	12 in. (306 mm)	N/A	N/A	302	311	70 x 8 mm, M20	
0324	12.7 in. (324 mm)	12	DN300	320	329	70 x 8 mm, M20	
0356	14 in. (356 mm)	14	DN350	352	361	70 x 8 mm, M20	
0368	14.4 in. (368 mm)	N/A	DN350	364	373	70 x 8 mm, M20	
0407	16 in. (407 mm)	16	DN400	401	417	90 x 10 mm, M24	
0458	18 in. (458 mm)	18	DN450	452	468	90 x 10 mm, M24	

Code	Diameter	Suitable pipe sizes				Clamp/bolt dimensions
		Inches	DIN	Millimeters		
				Min. OD	Max. OD	
0508	20 in. (508 mm)	20	DN500	502	518	90 x 10 mm, M24
0521	20.5 in. (521 mm)	N/A	DN500	515	531	90 x 10 mm, M24
0610	24 in. (610 mm)	24	DN600	604	620	90 x 10 mm, M24
0660	25.9 in. (660 mm)	26	N/A	654	670	90 x 10 mm, M24
0720	28.3 in. (720 mm)	N/A	N/A	714	730	90 x 10 mm, M24
0762	30 in. (762 mm)	30	N/A	756	772	90 x 10 mm, M24
0813	32 in. (813 mm)	32	DN800	807	823	90 x 10 mm, M24
0915	36 in. (915 mm)	36	DN900	909	925	90 x 10 mm, M24
1016	40 in. (1016 mm)	40	DN1000	1010	1026	90 x 10 mm, M24
1070	42.1 in. (1070 mm)	42	N/A	1064	1064	90 x 10 mm, M24
1219	47.9 in. (1219 mm)	48	N/A	1213	1229	90 x 10 mm, M24
1321	52 in. (1321 mm)	52	DN1300	1315	1331	N/A
1423	56 in. (1423 mm)	56	DN1400	1417	1433	N/A
1524	60 in. (1524 mm)	60	DN1500	1518	1534	N/A

### Corrosion protection inlay

Code	Description	
N	None	★
A	Material NBR	

## Additional options

### 316SST material options

Code	Description	
M1	316SST wire-on tag	★
M2	316SST components	★

### Sensor options

Code	Description	
A1 <sup>(1)</sup>	Single element Class A sensor from -58 to 572 °F (-50 to 300 °C)	★
A2 <sup>(2)</sup>	Dual element Class A sensor from -58 to 572 °F (-50 to 300 °C)	

(1) The A1 option is not available with the P3 sensor option.

(2) The A2 option is not available with the P4 sensor option.

**Assemble-to option**

Code	Description	
XA	Assemble sensor to specific temperature transmitter	★

**Cable gland options**

Code	Description	
G2	Cable gland, Ex d, brass, 7.5–11.9 mm	★
G7	Cable gland, M20 x 1.5, Ex e, blue, Polyamide, diam 5–9 mm	★

**Product certifications**

Code	Description	
E1	ATEX Flameproof	★
I1	ATEX Intrinsic Safety	★
E7	IECEX Flameproof	★
E5	FM Explosion-Proof	★
E6	CSA Explosion-Proof	★
EM	Technical Regulations Customs Union (EAC) Flameproof	★
IM	Technical Regulations Customs Union (EAC) Intrinsic Safety	★
E3	China Flameproof	★

**Cover chain option**

Code	Description	
G3	Cover chain (only available with Rosemount connection head material codes C, D, G, and H)	★

**Special certifications**

Code	Description	
LT	Special material to meet extended temperature range of -59.8 °F (-51 °C)	★



## How to order Rosemount X-well Technology

Rosemount X-well Technology is for temperature monitoring applications and is not intended for control or safety applications. It is available in the Rosemount 3144P Transmitter and 648 Wireless Transmitter in a factory assembled direct mount configuration with a Rosemount 0085 Pipe Clamp Sensor. It cannot be used in a remote mount configuration. Rosemount X-well Technology will only work as specified with factory supplied and assembled Rosemount 0085 Sensor silver tipped single element sensor with a 3.1 in. (80 mm) extension length. It will not work as specified if used with other sensors.

### Transmitter

The Rosemount 3144P option code requirements are:

Code	Description
D1-D4	Aluminum field mount housing
PT	Temperature measurement assembled with Rosemount X-well Technology
A	4-20 mA with digital signal based on HART® protocol
XA	Sensor specified separately and assembled to transmitter
C1	Custom configuration of date, descriptor, message, and wireless parameters (requires CDS with order)
HR7	Configured for HART Revision 7

The Rosemount 648 Wireless option code requirements are:

Code	Description
PT	Temperature measurement assembled with Rosemount X-well Technology
XA	Sensor specified separately and assembled to transmitter
C1	Custom configuration of date, descriptor, message, and wireless parameters (requires CDS with order)

### Pipe Clamp Sensor

The Rosemount 0085 Pipe Clamp Sensor option code requirements are:

Code	Description
N	No connection head
3	Sensor connection
P1	Sensor type
J	Extension type
0080	Extension length
XA	Assemble sensor to specific temperature transmitter

Rosemount X-well assemblies are available in most Rosemount 0085 Pipe Clamp sensor diameter sizes.

Typical model number of the assembly:	<b>Rosemount 3144P and 0085</b> 3144P D 1A 1 NA M5 PT C1 HR7 XA 0085 N 3 P1 J 0080 U 0169 N XA
	<b>Rosemount 648 Wireless and 0085</b> 648 D X 1 D NA WA3 WK1 M5 PT C1 XA 0085 N 3 P1 J 0080 U 0169 N XA

## Overview

### Rosemount pipe clamp overview

Emerson offers a range of RTDs alone, or as integrated temperature assemblies including Rosemount Temperature Transmitters and connection heads.

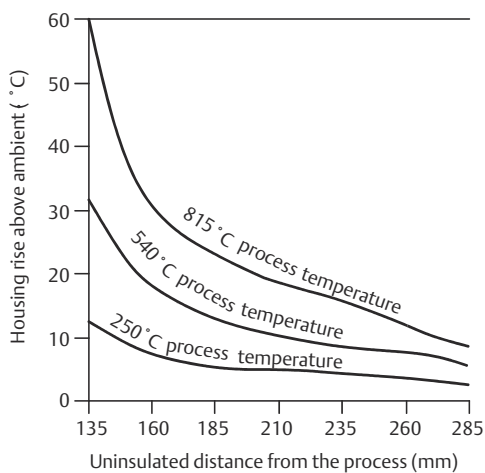
Rosemount Pipe Clamp Platinum RTD Sensors are highly linear and have a stable resistance versus temperature relationship. They are used primarily in industrial environments where high accuracy, durability, and long-term stability are required, and are designed to meet the most critical parameters of international standards: DIN EN 60751/IEC 751:1983 incorporating Amendments 1 and 2. <sup>(1)</sup>

Rosemount Pipe Clamp Sensors are available in single and dual element types.

### Selecting the extension length for a pipe clamp sensor

A direct mounting configuration allows heat from the process, aside from ambient temperature variations, to transfer from the pipe clamp to the transmitter housing. If the expected pipe surface temperature is near or above the transmitter specification limits, consider using additional extension length or a remote mounting configuration to isolate the transmitter. Figure 2 provides an example of the relationship between transmitter housing temperature rise and distance from the process.

**Figure 2: Transmitter Housing Temperature Rise vs. Uninsulated Distance from the Process**



#### Example

The rated ambient temperature specification for the transmitter is 185 °F (85 °C). If the maximum ambient temperature is 104 °F (40 °C) and the temperature to be measured is 1,004 °F (540 °C), the maximum allowable

(1) 100 Ω at 32 °F (0 °C), α = 0.00385 Ω x °C/Ω.

housing temperature rise is the rated temperature specification limit minus the existing ambient temperature (85 - 40), or 113 °F (45 °C).

As shown in [Figure 2](#), an uninsulated distance from the process of 3.5 in. (90 mm) will result in a housing temperature rise of 71 °F (22 °C). Therefore, 3.9 in. (100 mm) would be the minimum recommended distance from the process providing a safety factor of about 77 °F (25 °C). A longer length, such as 5.9 in. (150 mm), is desired to reduce errors caused by transmitter temperature effect, although in that case the transmitter may require extra support.

## 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 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.

## Rosemount pipe clamp platinum RTD

### Nominal resistance

In accordance with IEC 60751, the nominal resistance is defined:

100 Ω RTD at 32 °F (0 °C)

$\alpha = 0.00385 \Omega \times \text{°C}/\Omega$ , averaged between 32 to 212 °F (0 to 100 °C)

### Limit deviations

Tolerance Class B, as standard  $t = \pm(0.3 + 0.005 \times [t])$ ; temperature range -328 - 572 °F (-200 to 300 °C)

Tolerance Class A, as option  $t = \pm(0.15 + 0.002 \times [t])$ ; temperature range -58 - 572 °F (-50 to 300 °C)

### Process temperature range

-58 to 572 °F (-50 to 300 °C)

### Ambient temperature range

-40 - 185 °F (-40 to 85 °C)

### Self-heating

0.15 K/mW when measured as defined in IEC 60751

### Insulation resistance

1,000 MΩ minimum insulation resistance when measured at 500 Vdc at room temperature

### Sheath material

321 SST with mineral insulated cable construction and silver or nickel tip

### Lead wires

PTFE insulated, silver-coated copper wire (See [Figure 3](#))

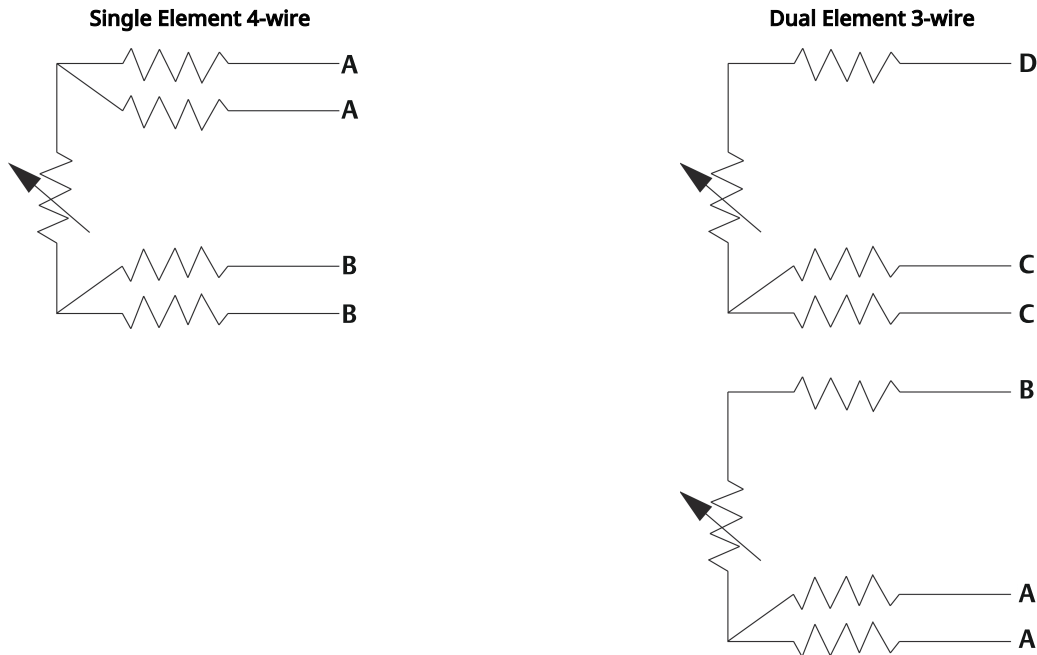
### Identification data

The model and serial numbers are engraved directly on the spring-loaded adapter.

**Ingress Protection (IP) rating for connection head**

IP68 and NEMA® 4X

**Figure 3: Sensor Lead Wire Termination - Pipe Clamp RTD Spring Loaded**



- A. Red
- B. White
- C. Black
- D. Yellow

**Vibration effect**

**Option Codes: P, B, C, S:** No effect on performance per the requirements of IEC 60770-1: 1999 field or pipeline with medium vibration level (10 - 60 Hz 0.075 mm displacement peak amplitude/60-1000 Hz 1g).

**Option Code: U (Universal Pipe Mount):** No effect on performance per the requirements of IEC 60770-1: 2010 field or pipeline with medium vibration level (10 - 60 Hz 0.30 mm displacement peak amplitude/60-1,000 Hz 2g).

**Functional specifications**

<b>Power</b>	Overvoltage category I
<b>Environmental</b>	Pollution degree 4

## Product certifications

For Rosemount 0085 product certifications, see the [Rosemount 0085 Pipe Clamp Sensor Assembly Quick Start Guide](#).

## Dimensional drawings

Figure 4: ½-in. ANPT spring-loaded adapter

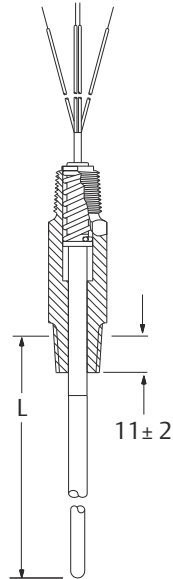


Figure 5: Universal Pipe Mount with Rosemount 3144P

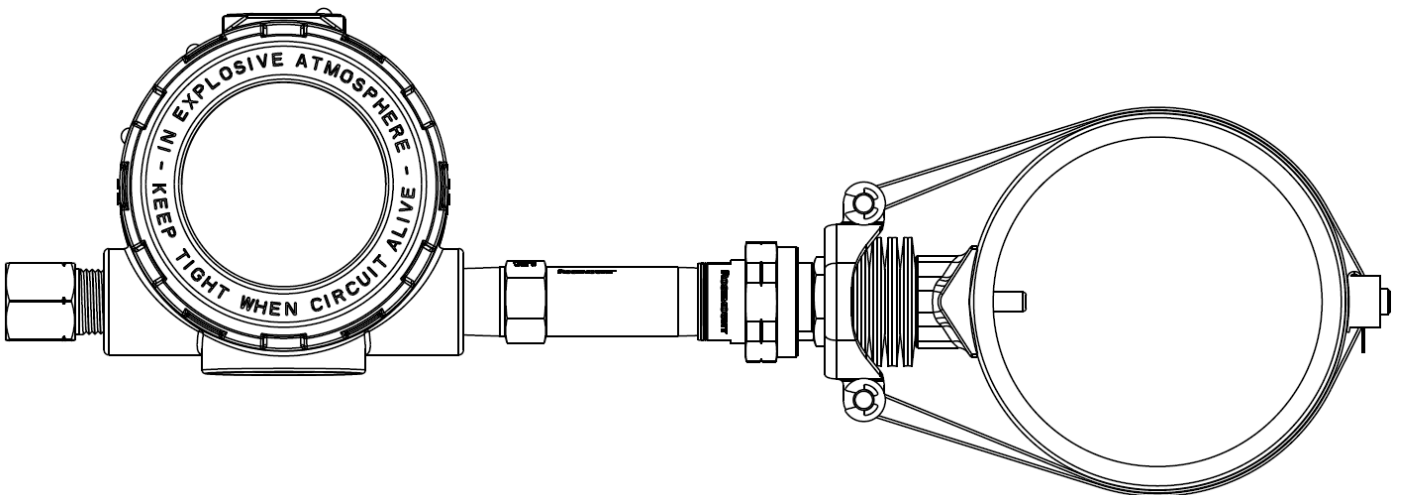
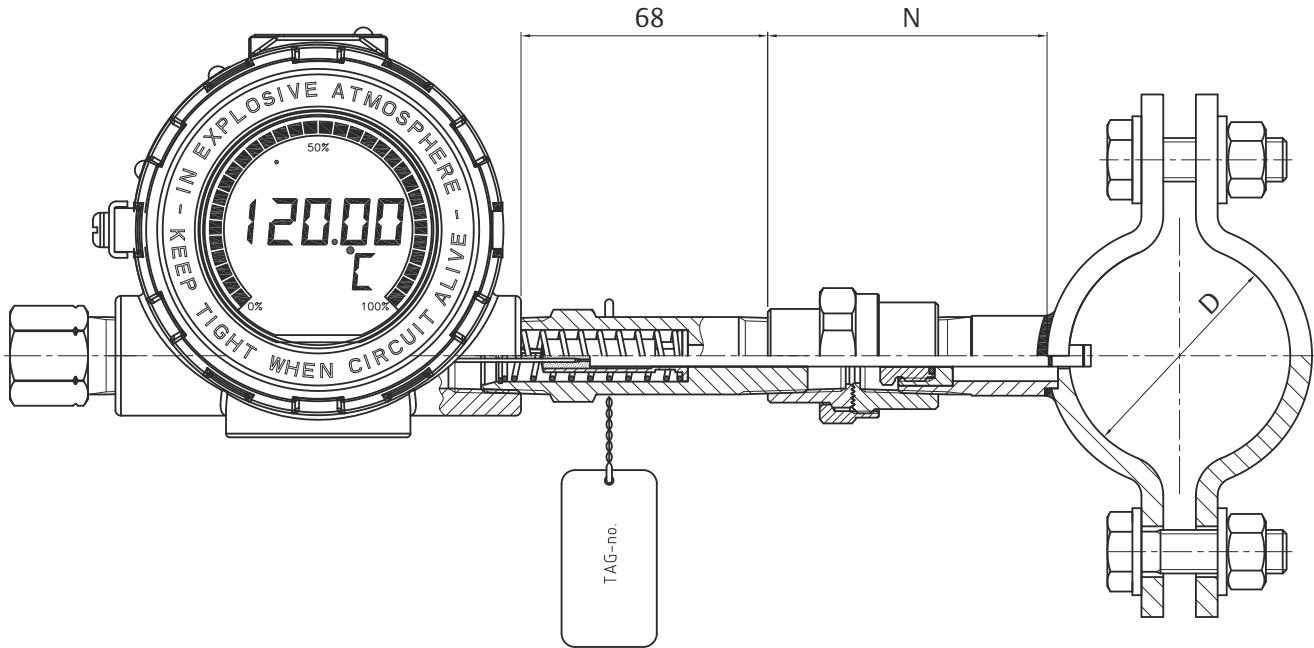


Figure 6: Pipe Clamp Sensor Assembly with Rosemount 3144P



**Note**  
Dimensions are in millimeters.

Figure 7: Universal Pipe Mount with Rosemount Connection Head

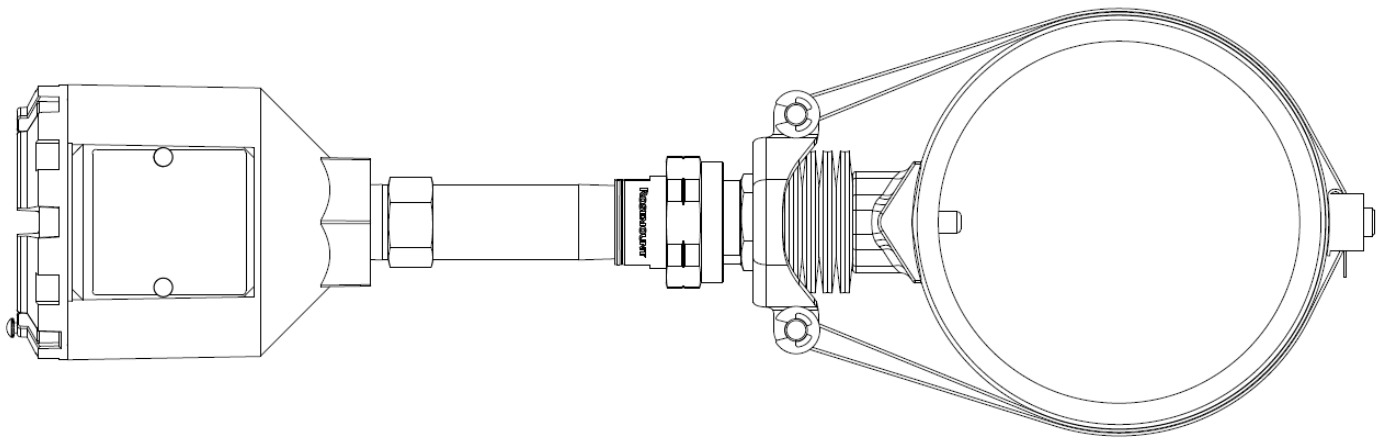
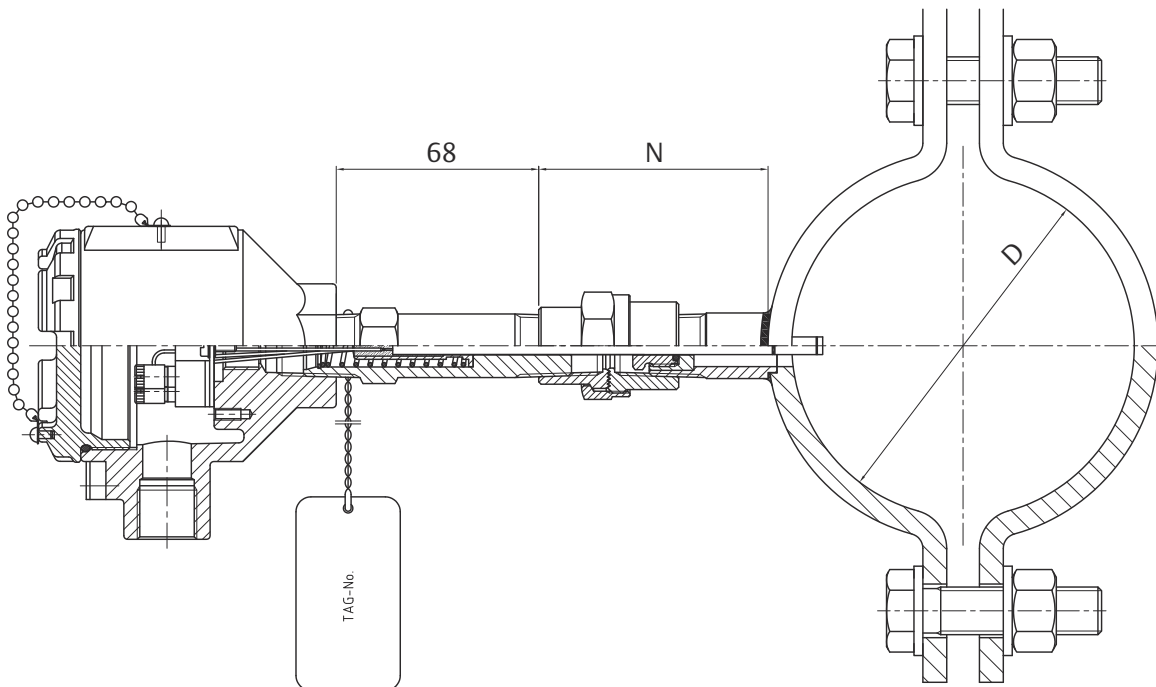


Figure 8: Pipe Clamp Sensor Assembly with Rosemount Connection Head



**Note**

Dimensions are in millimeters.

Figure 9: Universal Pipe Mount with Rosemount 648 Wireless Transmitter

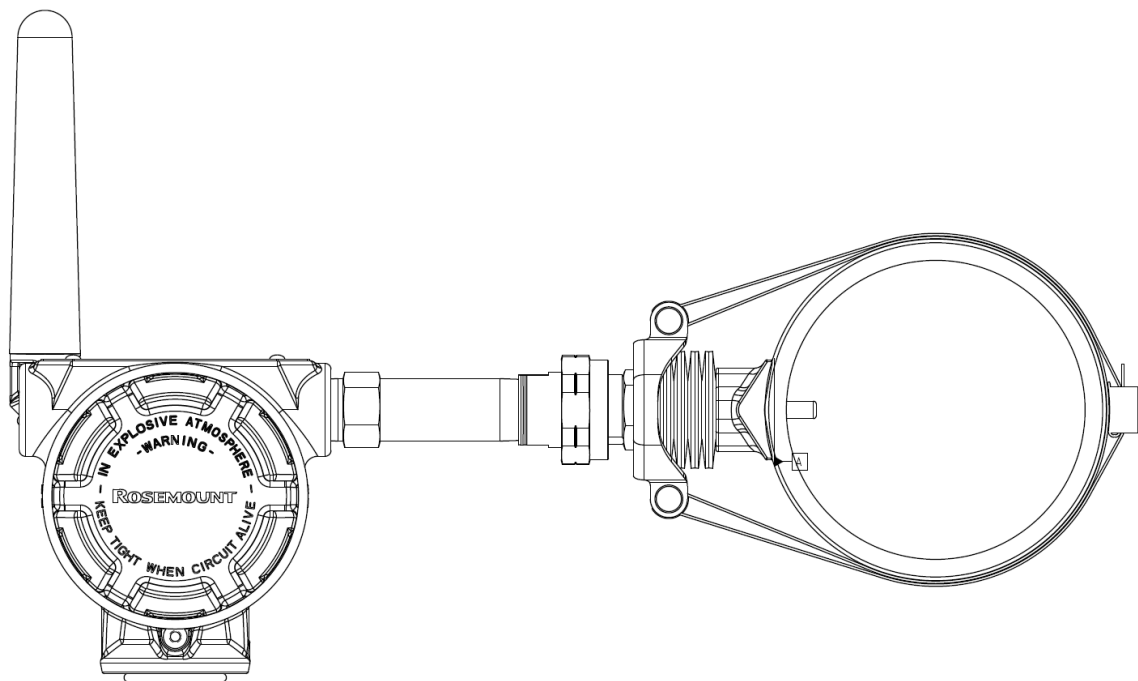
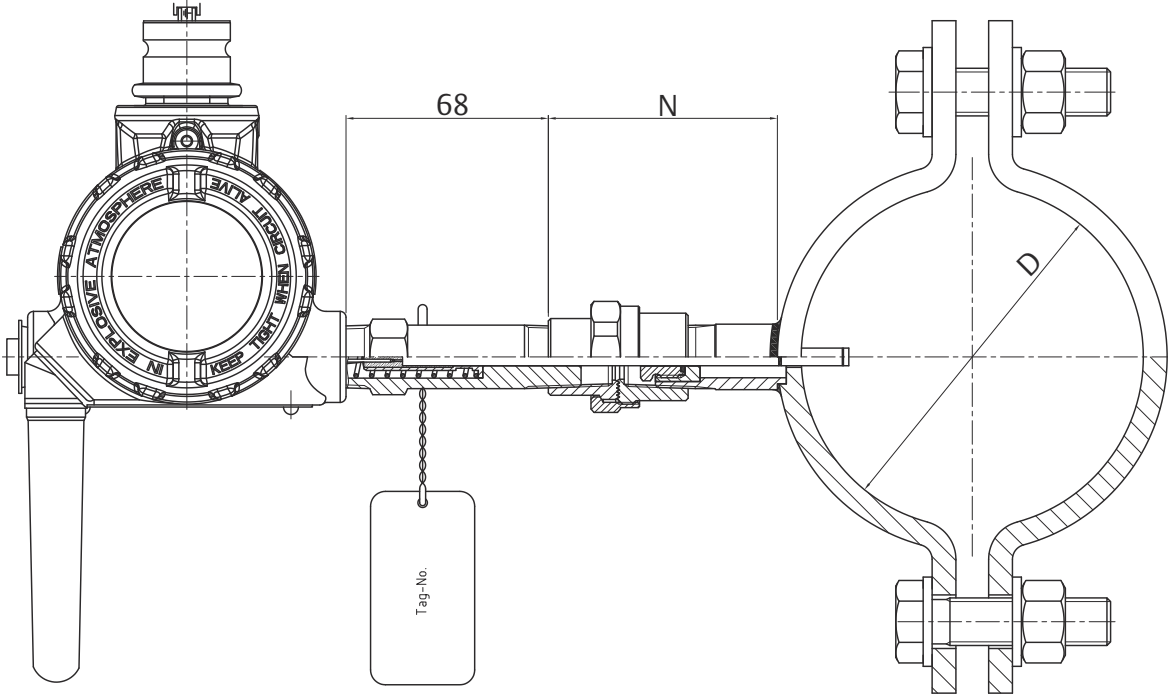


Figure 10: Pipe Clamp Sensor Assembly with Rosemount 648 Wireless Transmitter



**Note**  
Dimensions are in millimeters.









For more information: [Emerson.com/global](https://emerson.com/global)

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