Product Data Sheet
00813-0100-4019, Rev BA
Catalog 2008 - 2009

Rosemount 1080 and 1082 Multipoint Thermocouple and RTD Profiling Sensors

BEST INSTALLATION PRACTICES

- *Efficient way of monitoring a temperature profile for a wide range of applications, especially hot-spot detection*
- *Compact design of independent measurement points. Up to 60 points within an insert tube diameter of 8 mm (0.32 inch)*
- *Low cost per measurement point*
- *Onsite replacement of individual elements*
- *Only one process connection for up to 60 independent measurement points*
- *A complete temperature measurement solution. The transmitter, enclosure, sensor and thermowell can be ordered as a complete assembly using one model number*

Contents

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Introduction

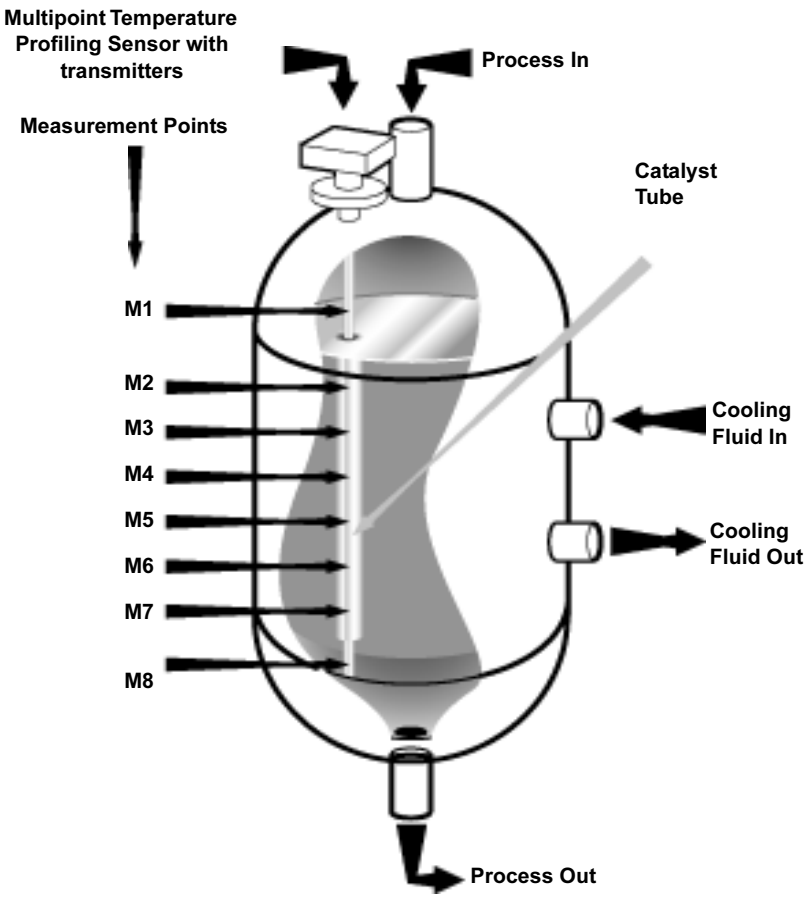
Multipoint Temperature Profiling Sensors measure the temperature at different points along its length. These sensors are frequently used in chemical and petrochemical industries because they provide an excellent temperature profile for chemical reactors, catalytic crackers, and fractionation towers. For these applications, Multipoint Temperature Profiling Sensors are the most efficient cost, maintenance, and data acquisition solution. Multipoint Temperature Profiling Sensors allow, with a single pipe penetration, the reading of up to 60 points that can be evaluated to provide a complete temperature profile of the column, tank, or reactor.

TYPICAL APPLICATIONS

Reactors

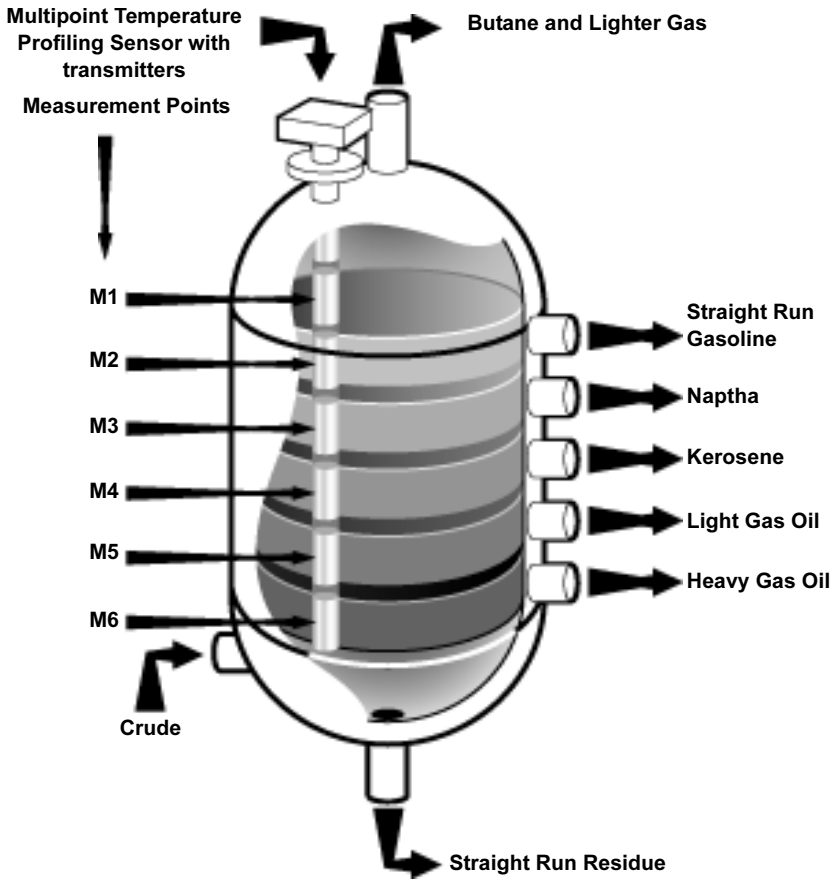
Multipoint Temperature Profiling Sensors improve monitoring and control of the reaction process within chemical reactors.

One example of how Multipoint Temperature Profiling Sensors are used is in the production of organic acid. Many organic acids are produced through an exothermal oxidation process. This chemical reaction takes place in multiple tubes filled with catalyst. The reaction components flow into the tubes (process in), react together (due to the catalyst), and then flow out as an acid (process out). The tubes are cooled by a cooling fluid flowing around the tubes. A critical process parameter is the process temperature. A Multipoint Temperature Profiling Sensor, such as the compact design of the Rosemount 1080C, measures the temperature profile inside a reaction tube. This temperature profile represents the profile of the other reaction tubes. Through monitoring the temperature profile the flow of reaction components and cooling fluid can be controlled to maximize the process output and reaction efficiency. A high local resolution of the temperature profile is required to ensure that the hot-spot (maximum measured temperature) does not reach the maximum allowable process temperature.



Distillation Columns / Fractionators

In a crude oil distillation process, crude oil is heated and run into a distillation column or fractionator, where a significant temperature profile can be measured (hot at the bottom, cooler at the top). Inside the column crude oil is separated into components or fractions according to weight and boiling point. As these component vapors travel up, they condense into liquid. The condensed components are captured by strategically mounted trays or “decks”. The trays are located at a height where the column temperature matches a components condensation point. The tray locations, or cut-points, are where products are then drawn from the column. Multipoint Temperature Profiling Sensors can be used to monitor the temperature at these cut-points and then control the temperature profile of the distillation column.



An Integrated Complete Solution

Each Multipoint Temperature Profiling Sensor can be used with integral mount temperature transmitters, allowing for a complete package solution for the monitoring of a temperature profile. Up to six Rosemount 848T Temperature Transmitters with FOUNDATION™ fieldbus (8 independent measurement channels per Rosemount 848T transmitter) or twenty-four head mount Rosemount 644H Smart Temperature Transmitters (HART) or head mount Rosemount 244EH PC-Programmable Temperature Transmitters can be mounted into one enclosure. This enclosure is then mounted on the top of the Multipoint Temperature Profiling Sensor. The transmitters can be configured by the factory to minimize start-up costs.

Rosemount 848T	Rosemount 644H	Rosemount 244EH
		
For product specifications see the Rosemount 848T Product Data Sheet (document number 00813-0100-4697)	For product specifications see the Rosemount 644 Product Data Sheet (document number 00813-0100-4728)	For product specifications see the Rosemount 244E Product Data Sheet (document number 00813-0100-4737)

PRODUCT OVERVIEW

Multipoint Temperature Profiling Sensors can be used in almost any temperature profile application. The Models 1080 and 1082 sensors are constructed using durable mineral insulated (MI) cable and can be provided with thermocouples (type E, J, K, or N) or with Pt100 resistance elements (RTDs). Rosemount Inc. has provided model structures for each multipoint sensor base design. These model numbers are developed to make it easy to order a Rosemount® Multipoint Temperature Profiling Sensor. The model structures are constructed with flexibility; If a mounting option or thermowell material is not available in the ordering tables, this does not mean that Rosemount Inc. can not provide it. Consult the factory and use the Configuration Data Sheet (CDS) provided for each Multipoint Temperature Profiling Sensors model, and Rosemount Inc. will provide the sensor which will accommodate the process application.

The tables below provide a quick reference for the performance and physical aspects of the three base Multipoint Temperature Profiling Sensors designs, the Rosemount 1080C (Compact), Rosemount 1080F (Contacting Fixture), and Rosemount 1082R (Contacting Fixture RTD).

TABLE 1. Performance Considerations

	Rosemount 1080C	Rosemount 1080F	Rosemount 1082R
Measuring Element Type	E, J, K, or N Thermocouple	E, J, K, or N Thermocouple	Pt100 RTD
Number of Measurement Points	2 minimum, 60 maximum Highest local resolution	2 minimum, 20 maximum	2 minimum, 12 maximum
Temperature Range	–40 to 750 °C (–40 to 1382 °F)	–40 to 800 °C (–40 to 1472 °F)	–40 to 450 °C (–40 to 842 °F)
Response Time	• Moderate, but depends on thermowell design used by the application	• Moderate, for Individual Guide Tube design • Fast, for Laminated Spring design • Fast, for Radial Spring design	• Moderate
Life Expectancy	Standard	High	High
Local High Resolution Temperature Profiling(1)	Yes	No	No
Durability	Standard	High	High
Replaceable individual Elements?	No	• Yes, for Individual Guide Tube design • No, for Laminated and Radial Spring design	No

(1) For identifying process fluid hot-spots

TABLE 2. Physical Considerations

	Rosemount 1080C	Rosemount 1080F	Rosemount 1082R
Required Inner Diameter of Existing Process Thermowells(1)	4 - 10 mm	≥ 25 mm	≥ 30 mm
Maximum Insertion Length	10m (33 ft) [30 m (99 ft) bundled version]	10m (33 ft) with thermowell [30 m (99 ft) without thermowell for Radial Spring and Laminated Spring designs only]	10m (33 ft) with thermowell [30 m (99 ft) without thermowell for Radial Spring design only]

(1) Depends on the number of measurement points

Rosemount 1080C Thermocouple Multipoint Sensor - Compact Design

The Rosemount 1080C is a compact Multipoint Sensor. The sensing elements are single ungrounded thermocouples. The high number of measurement points allow the monitoring of temperature profiles with a very good local resolution. The Rosemount 1080C is often used

for

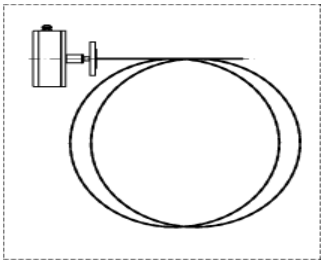
- hot-spot detection
- temperature profile monitoring

in

- tall reactors
- distillation columns.

The Rosemount 1080C is delivered without a thermowell because the thermowell typically already exists at the installation site. If a thermowell is required, please contact Rosemount Inc. The Rosemount 1080C is delivered either with an insert tube or in the bundled version (see Figure 2). The function of the insert tube is to fix the sensing elements and give mechanical stability to the sensor. The Rosemount 1080C, with an insert tube, can be shipped up to a length of 10m (33ft) and cannot be coiled for shipping. The 1080C in the bundled version can be delivered up to a length of 30m (99 ft) and is shipped as a coil (see Figure 1).

FIGURE 1. Bundled Multipoint Sensor Coiled for Shipping



SPECIFICATIONS

Functional

Number of Measurement Points
2 to 60

Temperature Limits
-40 to 750 °C (-40 to 1382 °F)

Physical

Physical Dimensions

TABLE 3. Available Insert Tube Outer Diameters

Diameter		Maximum Measurement Points
mm	inch	
3.5	0.14	25
4.5	0.18	30
5.0	0.20	40
6.0	0.24	60
8.0	0.32	60

TABLE 4. Length Limits

With Insert Tube		Bundled Version	
m	ft	m	ft
10	33	30	99

Performance

Ambient Temperature Limits
For enclosures and transmitters is –40 to 80 °C (–40 to 176 °F)

Insulation Resistance
Greater than 1000 MOhm at room temperature. See Table 5 for applied voltage.

TABLE 5. Applied Voltage for Insulation Resistance Measurement, based upon minearally insulated cable outside diameter

Outer Diameter		Test Voltage
mm	inch	
0.34	0.013	75 VDC
0.50	0.020	100 VDC
1.00	0.039	250 VDC

Accuracy

TABLE 6. Limits of Error Interchangeability for Class I Thermocouples

Type	
E	1.5 °C or 0.004 |t|[(1)], -40 to 750 °C
J	1.5 °C or 0.004 |t|[(1)], -40 to 750 °C
K	1.5 °C or 0.004 |t|[(1)], -40 to 750 °C
N	1.5 °C or 0.004 |t|[(1)], -40 to 750 °C

(1) Whichever is greater. "t" is in degrees Celsius

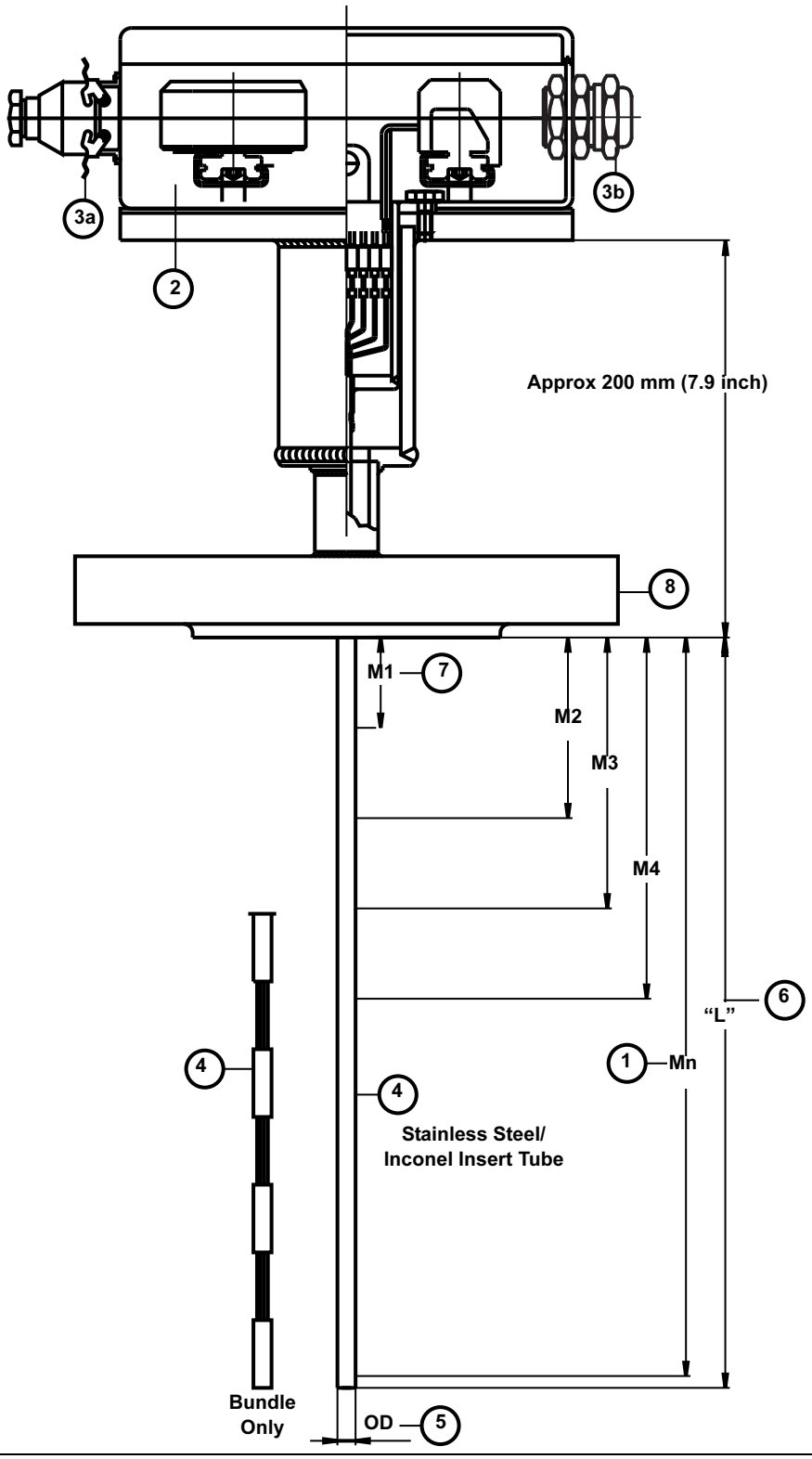
Enclosures
The enclosures are described in "Multipoint Sensor Enclosures" on page Temperature-18 and Temperature-20.

Individual Sensor Identification Data
By default, sensor 1 is closest to the flange. Remaining points are numbered incrementally. Use the C1 option and the CDS if a different numbering system is desired.

FIGURE 2. Multipoint Sensor Rosemount 1080C Compact Design

Description

1 Number of measurement points
2 Enclosure type (see “Multipoint Sensor Enclosures” on page Temperature-18 and Temperature-20.)
3 Enclosure entry (either 3a or 3b)
  3a Han®-Plug Connection
  3b Cable glands
4 Insert tube material
5 Insert tube outer diameter
6 Insertion length “L”
7 First measurement point location
8 Mounting style



ORDERING INFORMATION– ROSEMOUNT 1080C

Model	Product Description
1080C	Series 1080C Thermocouple Multipoint Profiling Sensor - Compact Design - Tolerance Class 1

Code	Thermocouple Type	Operating Temperature Range °C	Operating Temperature Range °F
E1	E	-40 to 750	-40 to 1382
J1	J	-40 to 750	-40 to 1382
K1	K	-40 to 750	-40 to 1382
N1	N	-40 to 750	-40 to 1382

Code	Number of Measurement Points
08	8
16	16
24	24
32	32
40	40
48	48
XX	Other Quantities (minimum. 02; maximum. 60)

Code	Transmitter Type	Maximum Measurement Points
A	Rosemount 848T Temperature Transmitter–FOUNDATION™ fieldbus	48
B	Rosemount 644H Temperature Transmitter–HART®	24
C	Rosemount 244EH Temperature Transmitter–PC-Programmable	24
N	No transmitter–Terminal strip only	60

Code	Enclosure Type	Material	IP Rating	NEMA Rating
A	EEx d CENELEC Flameproof Approval (consult factory for availability)	Aluminum	65	NEMA 4
B	EEx e CENELEC Increased Safety Approval (consult factory for availability)	Aluminum	65	NEMA 4
C	EEx i Intrinsically Safety acc. EN 50014 and EN 50020 with manufacturer declaration for Ex i use in Zone 1	Aluminum	65	NEMA 4
D	Standard Aluminum	Aluminum	65	NEMA 4
E	Standard Polyester	Polyester	65	NEMA 4
S	Special Enclosure Type - Configuration Data Sheet Required			

Code	Enclosure Entry
1	Single Multi-core Cable Gland
2	Multiple Cable Glands M20x1,5, one per measurement point
3	Han®-Plug Connection IP65
4	Customer Specified - Configuration Data Sheet Required

Code	Insert Tube Material	Maximum Temperature °C	Maximum Temperature °F
D	Stainless Steel - DIN 1.4404 (ANSI 316L)	450	842
P	Inconel®	750	1382
B	Bundle Only - DIN 1.4404 (ANSI 316L) - No Insertion Tube	450	842
C	Bundle Only - Inconel - No Insertion Tube	750	1382
S	Special Tube Material - Customer Specified - Configuration Data Sheet required		

Code	Insert Tube Outer Diameter	Maximum Measuring Points
00	No Insert Tube (used with Insert Tube Material codes B and C)	
35	3.5 mm (0.14 inch)	25
45	4.5 mm (0.18 inch)	30
50	5.0 mm (0.20 inch)	40
60	6.0 mm (0.24 inch)	60
80	8.0 mm (0.32 inch)	60

Code	Insertion Length “L”
01000	1000 mm (39 inch)
02000	2000 mm (79 inch)
03000	3000 mm (118 inch)
05000	5000 mm (197 inch)
07000	7000 mm (276 inch)
10000	10000 mm (394 inch)
XXXXX	Other lengths {maximum 10000mm (394 inch) with Insert Tube) (maximum 30000 mm (1181 inch) bundle only)

Note:
Length code is in mm. To convert to mm multiply the length in inches by 25.4.

Code	Measurement Point Distribution	
A	Equally Distributed Points	
C	Customer Specified–Configuration Data Sheet required	
Code	**First Measurement Point Location–Distance from base of mounting flange**	
00500	500 mm (20 inch)	
01000	1000 mm (39 inch)	
02000	2000 mm (79 inch)	
03000	3000 mm (118 inch)	
04000	4000 mm (158 inch)	
XXXXX	Other Lengths	
Code	**Mounting Style–Flange Material=DIN 1.4571 (ANSI 316Ti)**	**Process Connection**
F06	Flanged, ANSI	1 inch 150# RF
F12	Flanged, ANSI	1.5 inch 150# RF
F18	Flanged, ANSI	2 inch 150#RF
F24	Flanged, ANSI	1 inch 300# RF
F30	Flanged, ANSI	1.5 inch 300# RF
F36	Flanged, ANSI	2 inch 300# RF
F42	Flanged, ANSI	1 inch 600# RF
F48	Flanged, ANSI	1.5 inch 600# RF
F54	Flanged, ANSI	2 inch 600# RF
F66	Flanged, ANSI	1.5 inch 900# RF
F72	Flanged, ANSI	2 inch 900# RF
D06	Flanged, DIN	DN 25 PN 16
D12	Flanged, DIN	DN 25 PN 40
D18	Flanged, DIN	DN 40 PN16
D24	Flanged, DIN	DN 40 PN40
D28	Flanged, DIN	DN 50 PN 40
CDS	Customer Specified–Configuration Data Sheet Required	
Code	**Transmitter Options**	
	Approval Options (consult factory for availability)	
I5	FM Intrinsic Safety and Non-Incendive Approval	
I6	CSA Intrinsic Safety and Non-Incendive Approval	
I7	SAA Intrinsic Safety Approval	
I1	BASEEFA/CENELEC Intrinsic Safety	
	Frequency Options	
F5	50 Hz Line Voltage Filter (select this option only if 50 Hz is needed for the Rosemount 848T transmitter. 60 Hz is standard for Rosemount 848T transmitters)	
F6	60 Hz Line Voltage Filter (select this option only if 60 Hz is needed for the Rosemount 644 and 244E transmitters. 50 Hz is standard for Rosemount 644 and 244E transmitters)	
	NAMUR Options	
A1	NAMUR Alarm Levels Compliant to NE43	
CN	NAMUR Alarm Levels Compliant to NE43, Set Low	
Code	**Additional Options**	
	Special Tagging and Configuration Options	
C1(1)	Customer specified tagging and transmitter configuration–Configuration Data Sheet Required	
	Thermowell Options	
R16	Ring Joint Flange (ASME B16.5 ANSI flanged thermowells only)	
Typical Model Number: 1080C J1 08 A D 1 D 35 01000 A 00500 F36		

(1) Shipped with default transmitter configuration = 0 to 400 °C and default tagging of 1 through the number of measurement points. The first measurement point (closest to the enclosure) is tag "1." If other configuration is required, order option code C1.

Rosemount 1080F Thermocouple Multipoint Sensor – Contacting Fixture Design

The Rosemount 1080F Multipoint Sensor is versatile, robust, and designed for exceptional reliability with a long life expectancy. The individual measurement elements are ungrounded single thermocouples and the number of measurement points is limited to 20. These sensors are to be used for measurement of temperature profiles where a high local resolution is not required. The Rosemount 1080F can be ordered with or without a thermowell and is available in three different sensor configurations: Individual Guide Tube design, Radial Spring design, and Laminated Spring design.

Individual Guide Tube Design

The individual guide tube design offers the advantage of replaceable individual elements (see Figure 3). Mineral insulated thermocouple elements are inserted into each guide tube and guided to the specified measurement point. When ordered with spring loaded fittings, good thermal contact (fast response time) is achieved but the inside of the thermowell is not sealed from the atmosphere. When ordered with compression fittings, the thermowell is sealed from the atmosphere but the thermal contact isn't as good. The guide tube design, with or without a thermowell, cannot be coiled– which should be considered when shipping.

Radial Spring Design

This design provides good thermal contact between the thermocouple and thermowell. In this design, a radial spring presses the thermocouple against the inner wall of the thermowell. The flattened MI cable has full thermal contact with the thermowell. This design ensures the best possible response time. If ordered without a thermowell, it will be shipped as a coil. The individual thermocouples cannot be replaced.

Laminated Spring Design

This design provides good thermal contact between the thermocouple and the thermowell, facilitating a fast-time response. The laminated spring presses the thermocouple against the inner wall of the thermowell (see Figure 3) and is appropriate if the mounting flange is angled to the thermowell. The advantage of this design is the flexibility of the insert, which is similar to the flexibility of an oil dipstick. This design allows the sensor to follow the contour of the thermowell. If the laminated spring multipoint sensor is ordered without thermowell, it will be shipped as a coil. The individual thermocouples cannot be replaced.

Thermowell

Every Rosemount 1080F requires a thermowell for operation. When the Rosemount 1080F is ordered without thermowell, check the inner diameter of the existing thermowell. The inner wall of the thermowell must be smooth, especially at the welding joints, to insure that the multipoint sensor will not be damaged during insertion.

SPECIFICATIONS

Functional

Number of Measuring Points

2 to 20

Temperature Limits

- Type E and J: -40 to 750 °C (-40 to 1382 °F)
- Type K and N: -40 to 800 °C (-40 to 1472 °F)

Physical

Length Limits

10 m (33 ft) with thermowell– all designs
30 m (99 ft) without thermowell– Radial and Laminated designs only

Physical Dimensions

TABLE 7. Thermowell Diameter for Guide Tube and Laminated Spring Design

Number of Measurement Points	O.D.		I.D.	
	mm	inch	mm	inch
	2-inch schedule 80			
2 to 5	60.33	2.34	49.25	1.94
	$2^1/_2$-inch schedule 80			
6 to 8	73	2.9	59	2.3
	3-inch schedule 80			
9 to 20	88.9	3.5	73.7	2.9

TABLE 8. Thermowell Diameter for Radial Spring Design

Number of Measurement Points	O.D.		I.D.	
	mm	inch	mm	inch
2 to 8	73.0	2.9	59.0	2.3
9 to 20	88.9	3.5	73.7	2.9

Performance

Ambient Temperature Limits

For the enclosures and transmitters is –40 to 80 °C (–40 to 176 °F)

Insulation Resistance

Greater than 1000 MOhm at room temperature, test voltage is 500 VDC.

Accuracy

TABLE 9. Limits of Error Interchangeability for Class I Thermocouples

Type	
E	1.5 °C or 0.004 $\|t\|^{(1)}$, -40 to 750 °C
J	1.5 °C or 0.004 $\|t\|^{(1)}$, -40 to 750 °C
K	1.5 °C or 0.004 $\|t\|^{(1)}$, -40 to 800 °C
N	1.5 °C or 0.004 $\|t\|^{(1)}$, -40 to 800 °C

(1) Whichever is greater. "t" is in degrees Celsius.

Enclosures

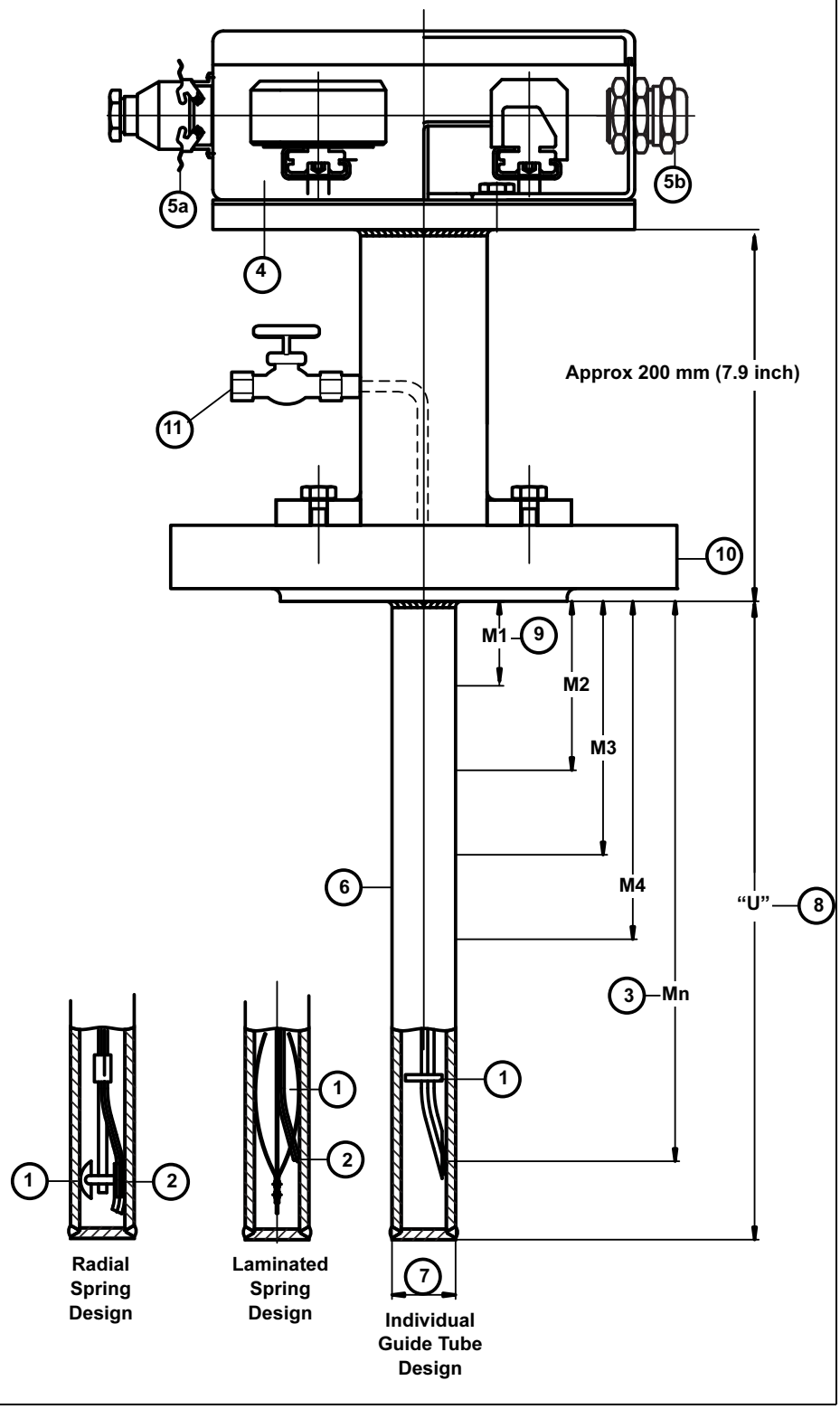
The enclosures are described in "Multipoint Sensor Enclosures" on page Temperature-18 and Temperature-20.

Individual Sensor Identification Data

By default, sensor 1 is closest to the flange. Remaining points are numbered incrementally. Use the C1 option and the CDS if a different numbering system is desired.

FIGURE 3. Multipoint Sensor Rosemount 1080F Thermocouple Multipoint Sensor–Contacting Fixture Design

Description	
1	Element of fixation method
2	Thermocouple type
3	Number of measurement points
4	Enclosure type (see “Multipoint Sensor Enclosures” on page Temperature-18 and Temperature-20.)
5	Enclosure entry (either 5a or 5b)
	5a Han-Plug Connection
	5b Cable glands
6	Thermowell material
7	Thermowell diameter
8	Immersion length “U”
9	First measurement point location
10	Mounting style
11	Leak Check Valve (optional)



ORDERING INFORMATION

Model	Product Description
1080F	Series 1080F Thermocouple Multipoint Profiling Sensor– Contacting Fixture Design, Tolerance Class 1

Code	Element Fixation Method
1	Individual Guide Tubes, Compression Fittings, Replaceable Elements
2	Individual Guide Tubes, Spring Loaded Fittings, Replaceable Elements
3	Laminated Spring Design, Compression Fittings, Fixed Elements
4	Radial Spring Design, Fixed Elements

Code	Thermocouple Type	Operating Temperature Range	
		°C	°F
E1	E	-40 to 750	-40 to 1382
J1	J	-40 to 750	-40 to 1382
K1	K	-40 to 800	-40 to 1472
N1	N	-40 to 800	-40 to 1472

Code	Number of Measurement Points
03	3
08	8
12	12
16	16
20	20
XX	Other Quantities (minimum. 02; maximum. 20)

Code	Transmitter Type	Maximum Measurement Points
A	Rosemount 848T Temperature Transmitter–FOUNDATION™ fieldbus	20
B	Rosemount 644H Temperature Transmitter–HART®	20
C	Rosemount 244EH Temperature Transmitter–PC-Programmable	20
N	No Transmitter–Terminal Strip Only	20

Code	Enclosure Type	Material	IP Rating	NEMA Rating
A	EEx d CENELEC Flameproof Approved (consult factory for availability)	Aluminum	65	NEMA 4
B	EEx e CENELEC Increased Safety Approval (consult factory for availability)	Aluminum	65	NEMA 4
C	EEx i Intrinsically Safety acc. EN 50014 and EN 50020 with manufacturer declaration for Ex i use in Zone 1	Aluminum	65	NEMA 4
D	Standard Aluminum	Aluminum	65	NEMA 4
E	Standard Polyester	Polyester	65	NEMA 4
S	Special Enclosure Type - Configuration Data Sheet Required			

Code	Enclosure Entry
1	Single Multi-core Cable Gland
2	Multiple Cable Glands M20x1,5, one per measurement point
3	Han®-Plug Connection IP65
4	Customer Specified - Configuration Data Sheet Required

Code	Thermowell Material	Maximum Temperature	
		°C	°F
D	Stainless Steel - DIN 1.4404 (ANSI 316L)	450	842
P	Heat Resistant Steel–DIN 1.7380 (ANSI 182-F22)	800	1472
S	Special Tube Material - Customer Specified - Configuration Data Sheet Required	Consult factory	
N	No thermowell		

Code	Thermowell Diameter
A	Standard–see Table 7 and Table 8
C	Customer specified–Configuration Data Sheet Required

Code	Immersion Length “U”
01000	1000 mm (39 inch)
02000	2000 mm (79 inch)
03000	3000 mm (118 inch)
05000	5000 mm (197 inch)
07000	7000 mm (276 inch)
10000	10000 mm (394 inch)
XXXXX	Other Length {maximum 10000mm (394 inch with thermowell) (maximum 30000 mm (1181 inch) without thermowell– Laminated and Radial Spring designs only)

Note:
Length code is in mm. To convert to mm multiply the length in inches by 25.4.

Code	Measurement Point Distribution	
A	Equally Distributed Points (last point placed approx 50 mm from the bottom of the thermowell)	
C	Customer Specified–Configuration Data Sheet Required	
Code	**First Measurement Point Location–Distance from base of mounting flange**	
00500	500 mm (20 in)	
01000	1000 mm (39 in)	
02000	2000 mm (79 in)	
03000	3000 mm (118 in)	
04000	4000 mm (158 in)	
XXXXX	Other Lengths	
Code	**Mounting Style–Flange Material= DIN 1.4404 (ANSI 316L)**	**Process Connection**
F36	Flanged, ANSI	2 inch 300# RF
F74	Flanged, ANSI	$2^1/_2$ inch 300# RF
F76	Flanged, ANSI	3 inch 300# RF
F54	Flanged, ANSI	2 inch 600# RF
F78	Flanged, ANSI	$2^1/_2$ inch 600# RF
F80	Flanged, ANSI	3 inch 600# RF
F72	Flanged, ANSI	2 inch 900# RF
F82	Flanged, ANSI	$2^1/_2$ inch 900# RF
F84	Flanged, ANSI	3 inch 900# RF
D26	Flanged, DIN	DN 50 PN 25/40
CDS	Customer Specified–Configuration Data Sheet required	
Code	**Transmitter Options**	
	Approval Options (consult factory for availability)	
I5	FM Intrinsic Safety and Non-Incendive Approval	
I6	CSA Intrinsic Safety and Non-Incendive Approval	
I7	SAA Intrinsic Safety Approval	
I1	BASEEFA/CENELEC Intrinsic Safety	
	Frequency Options	
F5	50 Hz Line Voltage Filter (select this option only if 50 Hz is needed for the Rosemount 848T transmitter. 60 Hz is standard for Rosemount 848T transmitters)	
F6	60 Hz Line Voltage Filter (select this option only if 60 Hz is needed for the Rosemount 644 and 244E transmitters. 50 Hz is standard for Rosemount 644 and 244E transmitters)	
	NAMUR Options	
A1	NAMUR Alarm Levels Compliant to NE43	
CN	NAMUR Alarm Levels Compliant to NE43, Set Low	
Code	**Additional Options**	
	Special Tagging and Configuration Options	
C1(1)	Customer Specified Tagging and Transmitter Configuration–Configuration Data Sheet required	
	Thermowell Options	
Q8	Thermowell Material Certification, DIN EN 10204 3.1.B	
R01	Thermowell Pressure Testing	
R03	Thermowell Dye Penetration Testing	
R07	Full Penetration Weld	
R16	Ring Joint Flange (ASME B16.5 ANSI flanged thermowells only)	
	Process Connection Options	
P01	Leak Check Valve	

Typical Model Number: 1080F 2 J1 08 A D 1 D A 01000 A 00500 F36 R01 P01

(1) Shipped with default transmitter configuration = 0 to 400 °C and default tagging of 1 through the number of measurement points. The first measurement point (closest to the enclosure) is tag "1." If other configuration is required, order option code C1.

Rosemount 1082R RTD Multipoint Sensor– Contacting Fixture Design

The Rosemount 1082R Multipoint Sensor is a robust sensor with a long life expectancy. The individual measurement elements are resistance elements. The standard is a 4-wire RTD, except when the Rosemount 1082R is ordered with Rosemount 848T transmitter (in which case a 3-wire configuration is provided). The number of measurement points is restricted to 12. The Rosemount 1082R is used when a high local resolution is not required. These multipoint sensors can be ordered with or without thermowells.

The Rosemount 1082R is the best solution when data acquisition equipment requires an RTD output signal. However, a thermocouple multipoint sensor (such as the Rosemount 1080F) may be the optimal solution if transmitters are used (higher temperature range, more measurement points, same output). The Rosemount 1082R offers two different element fixation methods the Radial Spring design and the Spacer Design.

Radial Spring Design:

This design provides very good thermal contact between the RTD and the thermowell. A radial spring presses the RTD element against the inner wall of the thermowell ensuring the best possible response time (see Figure 4). If ordered without a thermowell it will be shipped as a coil. The individual RTD elements cannot be replaced.

Spacer Design:

This design (see Figure 4) uses spacer disks to guide the resistance elements into position. The individual RTD elements are not replaceable. For shipping purposes, the spacer design, with or without a thermowell, cannot be coiled.

Thermowell

Every Rosemount 1082R requires a thermowell for operation. When the Rosemount 1082R is ordered without a thermowell, check the inner diameter of the existing thermowell. The inner wall of the thermowell must be smooth, especially at the welding joints, to insure that the multipoint sensor will not be damaged by insertion.

SPECIFICATIONS

Functional

Number of Measurement Points

2 to 12

Temperature Limits

-40 to 450 °C (-40 to 842 °F)

Physical

Physical Dimensions

TABLE 10. Thermowell Required Diameters for the Radial Spring and Spacer Design

Number of Measurement Points	O.D.		I.D.	
	mm	inch	mm	inch
2 to 8	73	2.9	59	2.3
9 to 12	88.9	3.5	73.7	2.9

Length Limits

10 m (33 ft) with thermowell
30 m (99 ft) without thermowell– Radial Spring design only

Performance

Ambient Temperature Limits

For the enclosures and transmitters is –40 to 80 °C (–40 to 176 °F)

Insulation Resistance:

Greater than 1000 MOhms at room temperature, test voltage is 500 VDC.

Accuracy

TABLE 11. Accuracy in Accordance to DIN EN 60751

Class	
A	±(0.15K+0.0020*|t|)
B	±(0.30K+0.0050*|t|)
"t" is the temperature in °C.	

Enclosures

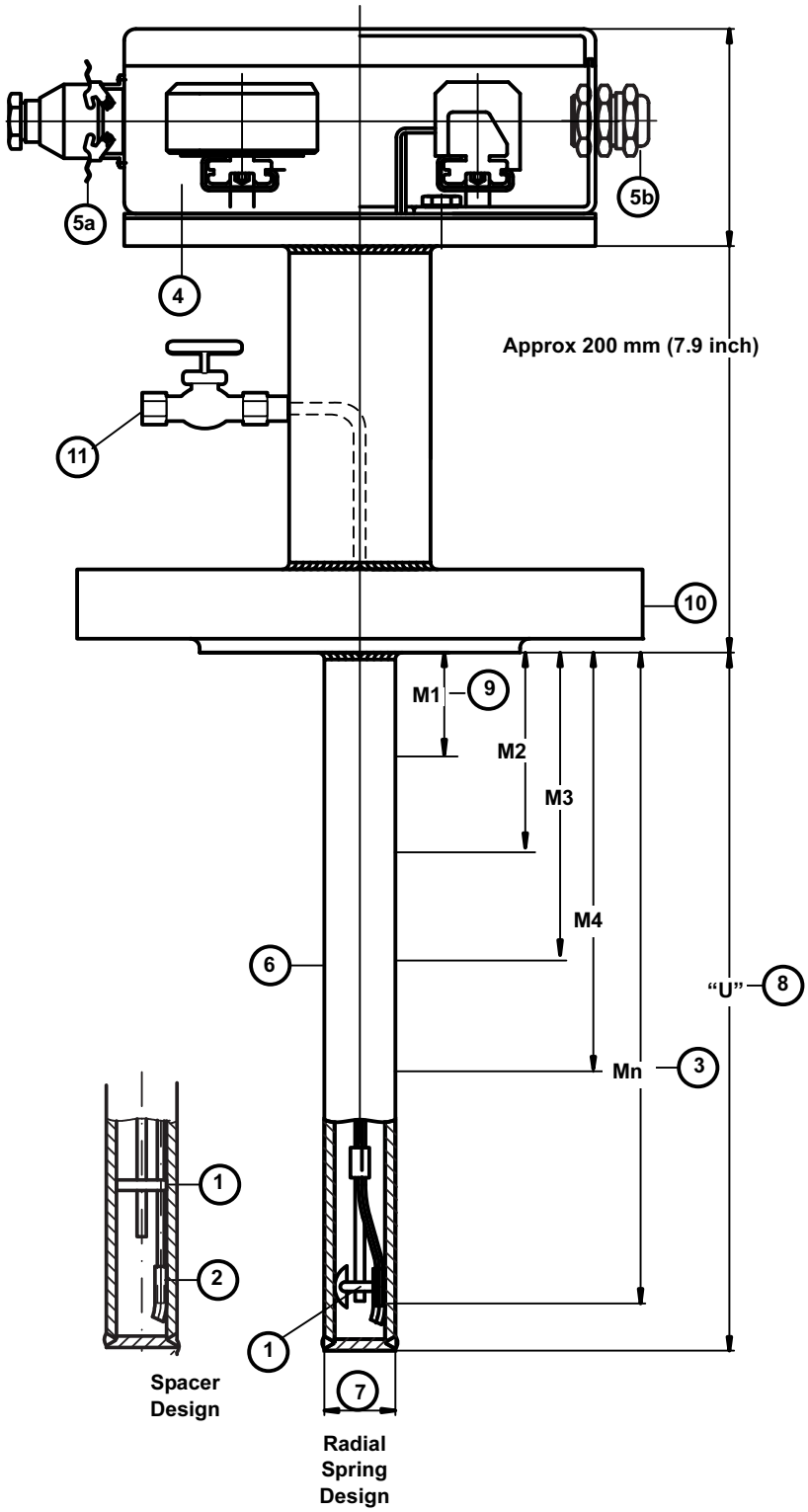
The enclosures are described in "Multipoint Sensor Enclosures" on page Temperature-18 and Temperature-20.

Individual Sensor Identification Data

By default, sensor 1 is closest to the flange. Remaining points are numbered incrementally. Use the C1 option and the CDS if a different numbering system is desired.

FIGURE 4. Multipoint Sensor Rosemount 1082R, Radial Spring and Spacer Design (Pt 100 RTD)

Description	
1	Element fixation method
2	Pt100 RTD
3	Number of measurement points
4	Enclosure type (see “Multipoint Sensor Enclosures” on page Temperature-18 and Temperature-20.)
5	Enclosure entry (either 5a or 5b)
	5a Han-Plug Connection
	5b Cable glands
6	Thermowell material
7	Thermowell outside diameter
8	Immersion length “U”
9	First measurement point location
10	Mounting style
11	Leak Check Valve (optional)



ORDERING INFORMATION

Model	Product Description
1082R	Series 1082R RTD Multipoint Profiling Sensor–Contacting Fixture Design

Code	Element Fixation Method
1	Radial Springs Design
2	Spacer Design

Code	Sensor Type	Operating Temperature Range °C	Operating Temperature Range °F
A	Pt100 Class A	–40 to 450	–40 to 842
B	Pt100, Class B	–40 to 450	–40 to 842

Code	Number of Measurement Points
05	5
08	8
12	12
XX	Other Quantities (minimum. 02; maximum. 12)

Code	Transmitter Type	Maximum Measurement Points
A	Rosemount 848T Temperature Transmitter–FOUNDATION™ fieldbus	12
B	Rosemount 644H Temperature Transmitter–HART®	12
C	Rosemount 244EH Temperature Transmitter–PC-Programmable	12
N	No transmitter–Terminal strip only	12

Code	Enclosure Type	Material	IP Rating	NEMA Rating
A	EEx d CENELEC Flameproof Approved (consult factory for availability)	Aluminum	65	NEMA 4
B	EEx e CENELEC Increased Safety Approval (consult factory for availability)	Aluminum	65	NEMA 4
C	EEx i Intrinsically Safety acc. EN 50014 and EN 50020 with manufacturer declaration for Ex i use in Zone 1	Aluminum	65	NEMA 4
D	Standard Aluminum	Aluminum	65	NEMA 4
E	Standard Polyester	Polyester	65	NEMA 4
S	Special Enclosure Type - Configuration Data Sheet Required			

Code	Enclosure Entry
1	Single Multi-core Cable Gland
2	Multiple Cable Glands M20x1,5, one per measurement point
3	Han®-Plug Connection IP65
4	Customer Specified - CDS required, consult factory

Code	Thermowell Material	Maximum Temperature °C	Maximum Temperature °F
D	Stainless Steel - DIN 1.4404 (ANSI 316L)	450	842
P	Heat Resistant Steel–DIN 1.7380 (ANSI 182-F22)	750	1382
S	Special Tube Material - Customer Specified - Configuration Data Sheet Required	Consult factory	
N	No thermowell		

Code	Thermowell Diameter
A	Standard–see Table 7 and Table 8
C	Customer Specified–CDS required

Code	Immersion Length “U”
01000	1000 mm (39 inch)
02000	2000 mm (79 inch)
03000	3000 mm (118 inch)
05000	5000 mm (197 inch)
07000	7000 mm (276 inch)
10000	10000 mm (394 inch)
XXXXX	Other Lengths {maximum 10000mm (394 in) with thermowell) (maximum 30000 without thermowell–Radial Spring design only)

Note:
Length code is in mm. To convert to mm multiply the length in inches by 25.4.

Code	Measurement Point Distribution	
A	Equally Distributed Points (last point placed approx 50 mm from the bottom of the thermowell)	
C	Customer Specified–Customer Data Sheet required	
Code	**First Measurement Point Location–Distance from base of mounting flange**	
00500	500 mm (20 inch)	
01000	1000 mm (39 inch)	
02000	2000 mm (79 inch)	
03000	3000 mm (118 inch)	
04000	4000 mm (158 inch)	
XXXXX	Other Lengths	
Code	**Mounting Style–Flange Material= DIN 1.4404 (ANSI 316L)**	**Process Connection**
F36	Flanged, ANSI	2 inch 300# RF
F74	Flanged, ANSI	$2^1/_2$ inch 300# RF
F76	Flanged, ANSI	3 inch 300# RF
F54	Flanged, ANSI	2 inch 600# RF
F78	Flanged, ANSI	$2^1/_2$ inch 600# RF
F80	Flanged, ANSI	3 inch 600# RF
F72	Flanged, ANSI	2 inch 900# RF
F82	Flanged, ANSI	$2^1/_2$ inch 900# RF
F84	Flanged, ANSI	3 inch 900# RF
D26	Flanged, DIN	DN 50 PN 25/40
CDS	Customer Specified–Customer Data Sheet Required	
Code	**Transmitter Options**	
	Approval Options (consult factory for availability)	
I5	FM Intrinsic Safety and Non-Incendive Approval	
I6	CSA Intrinsic Safety and Non-Incendive Approval	
I7	SAA Intrinsic Safety Approval	
I1	BASEEFA/CENELEC Intrinsic Safety	
	Frequency Options	
F5	50 Hz Line Voltage Filter (select this option only if 50 Hz is needed for the Rosemount 848T transmitter. 60 Hz is standard for Rosemount 848T transmitters)	
F6	60 Hz Line Voltage Filter (select this option only if 60 Hz is needed for the Rosemount 644 and 244E transmitters. 50 Hz is standard for Rosemount 644 and 244E transmitters)	
	NAMUR Options	
A1	NAMUR Alarm Levels Compliant to NE43	
CN	NAMUR Alarm Levels Compliant to NE43, Set Low	
Code	**Additional Options**	
	Special Tagging and Configuration Options	
C1(1)	Customer Specified Tagging and Transmitter Configuration–Configuration Data Sheet required	
	Thermowell Options	
Q8	Thermowell Material Certification, DIN EN 10204 3.1.B	
R01	Thermowell Pressure Testing	
R03	Thermowell Dye Penetration Testing	
R07	Full Penetration Weld	
R16	Ring Joint Flange (ASME B16.5 ANSI flanged thermowells only)	
	Process Connection Options	
P01	Leak Check Valve	

Typical Model Number: 1082R 1 A 08 A D 1 D A 01000 A 00500 F36 R01

(1) Shipped with default transmitter configuration = 0 to 400 °C and default tagging of 1 through the number of measurement points. The first measurement point (closest to the enclosure) is tag "1." If other configuration is required, order option code C1.

Multipoint Sensor Enclosures

Rosemount multipoint sensors are offered in three general enclosure types:

- Aluminum (A)
- Flameproof Aluminum (FPA)
- Polyester (P).

The enclosure size used with a multipoint sensor is determined by three factors, as shown in the tables:

- Multipoint sensors base model
- Number of measurement points
- Type of transmitter

See Table 12 on page Temperature-19 to determine the enclosure dimensions.

No Transmitter (enclosure and terminal strip only)

Measurement Points	Number of terminals			Enclosure Size		
	Rosemount 1080C	Rosemount 1080F	Rosemount 1082R	Rosemount 1080C	Rosemount 1080F	Rosemount 1082R
2 – 12	4 – 24	4 – 24	8 – 24	Size 1 (A, P) Size 5 (FPA	Size 1 (A, P) Size 5 (FPA	Size 1 (A, P) Size 5 (FPA
13 – 20	26 – 40	26 – 40	N/A(1)	Size 1 (A, P) Size 5 (FPA	Size 1 (A, P) Size 5 (FPA	N/A(1)
21 – 24	42 – 48	N/A(1)	N/A(1)	Size 1 (A, P) Size 5 (FPA	N/A(1)	N/A(1)
25 – 40	50 – 80	N/A(1)	N/A(1)	Size 2 (A, P) Size 6 (FPA	N/A(1)	N/A(1)
41 – 60	82 – 120	N/A(1)	N/A(1)	Size 3 (A) Size 4 (F) Size 7 (FPA)	N/A(1)	N/A(1)

(1) Not Applicable

With Rosemount 848T transmitters

Measurement Points	Number of Transmitters	Enclosure Size		
		Rosemount 1080C	Rosemount 1080F	Rosemount 1082R
2 –8	1	Size 1 (A, P) Size 5 (FPA	Size 1 (A, P) Size 5 (FPA	Size 1 (A, P) Size 5 (FPA
9 – 12	2	Size 3 (A) Size 4 (F) Size 7 (FPA)	Size 3 (A) Size 4 (F) Size 7 (FPA)	Size 3 (A) Size 4 (F) Size 7 (FPA)
14 – 16	2	Size 3 (A) Size 4 (F) Size 7 (FPA)	Size 3 (A) Size 4 (F) Size 7 (FPA)	N/A(1)
17 – 20	3	Size 3 (A) Size 4 (F) Size 7 (FPA)	Size 3 (A) Size 4 (F) Size 7 (FPA)	N/A(1)
21 – 24	3	Size 3 (A) Size 4 (F) Size 7 (FPA)	N/A(1)	N/A(1)

Measurement Points	Number of Transmitters	Enclosure Size		
		Rosemount 1080C	Rosemount 1080F	Rosemount 1082R
25 – 32	4	Size 3 (A) Size 4 (F) Size 7 (FPA)	N/A(1)	N/A(1)
33 – 40	5	Size 3 (A) Size 4 (F) Size 8 (FPA)	N/A(1)	N/A(1)
41 – 48	6	Size 3 (A) Size 4 (F) Size 8 (FPA)	N/A(1)	N/A(1)

(1) Not Applicable

With Rosemount 644H or 244EH transmitters

Measurement Point	Number of Transmitters	Enclosure Size		
		Rosemount 1080C	Rosemount 1080F	Rosemount 1082R
2 – 8	2 – 8	Size 1 (A, P) Size 5 (FPA	Size 1 (A, P) Size 5 (FPA	Size 1 (A, P) Size 5 (FPA
9 – 10	9 – 10	Size 2 (A, P) Size 6 (FPA	Size 2 (A, P) Size 6 (FPA	Size 2 (A, P) Size 6 (FPA
11 – 12	11 – 12	Size 3 (A) Size 4 (F) Size 7 (FPA)	Size 3 (A) Size 4 (F) Size 7 (FPA)	Size 3 (A) Size 4 (F) Size 7 (FPA)
13 – 20	13 – 20	Size 3 (A) Size 4 (F) Size 8 (FPA)	Size 3 (A) Size 4 (F) Size 8 (FPA)	N/A(1)
21 – 24	21 – 24	Size 3 (A) Size 4 (F) Size 8 (FPA)	N/A(1)	N/A(1)

(1) Not Applicable

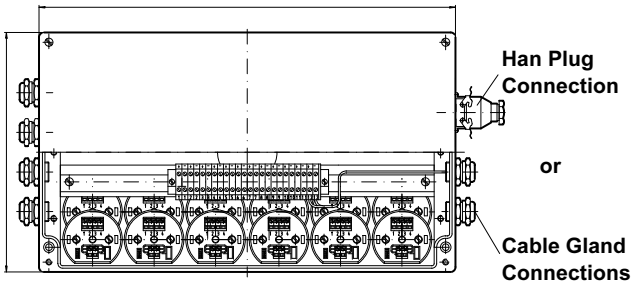
TABLE 12. Enclosure dimensions

Size	Length X Width x Depth (mm)	Length X Width x Depth (inch)
1	260 x 160 x 90	10.2 x 6.3 x 3.5
2	360 x 160 x 90	14.2 x 6.3 x 3.5
3	420 x 240 x 210	16.5 x 9.4 x 8.3
4	400 x 405 x 210	15.7 x 15.9 x 8.3
5	298 x 198 x 212	11.7 x 7.8 x 8.3
6	418 x 218 x 212	16.4 x 8.6 x 8.3
7	432 x 332 x 223	17.0 x 13.1 x 8.8
8	632 x 432 x 265	24.9 x 17.0 x 10.4

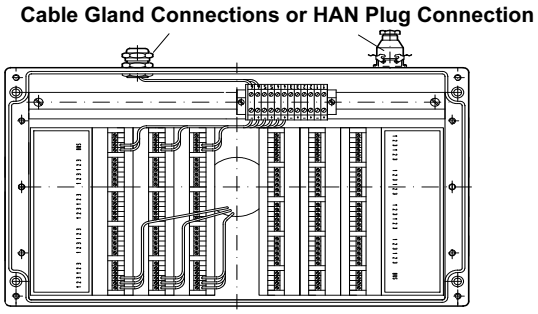
ENCLOSURES WITH TRANSMITTERS

The drawings below show the maximum number of transmitters that are permitted in the largest enclosure. If a Han plug connection is ordered, only one is required (and is included) with the enclosure.

For use with Rosemount 644H or 244EH
24 transmitters (24 measurement points)



For use with the Rosemount 848T
6 transmitters (48 measurement points)



Rosemount 1080 and 1082

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Emerson Process Management

Rosemount Inc.
8200 Market Boulevard
Chanhassen, MN 55317 USA
T (U.S.) 1-800-999-9307
T (International) (952) 906-8888
F (952) 949-7001

www.rosemount.com

Emerson Process Management
Heath Place
Bognor Regis
West Sussex PO22 9SH
England
T 44 (1243) 863 121
F 44 (1243) 867 5541

Emerson Process Management Asia Pacific Private Limited
1 Pandan Crescent
Singapore 128461
T (65) 6777 8211
F (65) 6777 0947
Enquiries@AP.emersonprocess.com

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Process Management