HIGH ACCURACY

PRODUCT DATASHEET

Rosemount™ 222

Toroidal Flow Through Conductivity Sensor

A high performance sensor with ease of maintenance in mind

The Rosemount 222 toroidal flow through conductivity sensor measures conductivity in highly conductive liquids up to 2 S/cm (2,000,000 μS/cm). A noninvasive flow through design allows for in-line installations without any obstruction to sample and makes these sensors ideal for use with viscous or fibrous liquids.

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Overview

High Performance and Reliability

- Robust measurements - insensitive to process flow rate and direction.

- Avoid accumulation of solids with no part of the sensor protruding into the sample flow.

- Corrosion resistant Teflon pipe liner.

- Pt-100 RTD included to allow temperature compensated conductivity measurements.

- Operates in process temperatures up to 182 °C (356 °F).

Meet Process Flow Through Requirements

- Versatile installation options allows for direct mounting into 1 in. and 2 in. process lines with 150 lb or 300 lb raised face threaded ANSI B16.5 flanges.

- Plugging resistant and suitable for liquids containing high levels of suspended solids.

Contents

Ordering Information

Rosemount 222 Flow Through Toroidal sensors feature Teflon-lined pipe, an external toroid assembly, two unlined carbon steel outer flanges, a Pt-100 RTD temperature compensation element, and 20 ft. of integral cable. Optional stainless steel outer flanges are also available.

Table 1. Rosemount 222 Flow Through Toroidal Conductivity Sensor Ordering Information

Model	Sensor type
222	Flow Through Toroidal Conductivity Sensor
Sizes [1]	
01	1 inch, 150 lb flange
02	2 inch, 150 lb flange
05	1 inch, 300 lb flange
06	2 inch, 300 lb flange
Flange option	
_	No selection
21	316 stainless steel outer flange [2]
Cable	
54	Standard integral cable [3]
Typical Model Number: 222-01-_-54	

1. Grounding rings are required for proper operation if the outer flanges of the Rosemount 222 sensor are substituted by the customer with non-conductive flanges. Order SQ 7430 and consult the factory for pricing.
2. Only available with option -01.
3. Cables can be extended using remote junction box PN 23550-00 and extension cable. See Accessories .

Specifications

Table 2. Rosemount 222 sensor specifications

Sensor type	
Toroidal Flow Through Conductivity Sensor	
Cell constant (Nominal)	
1 in. diameter	6/cm
2 in. diameter	4/cm
Process connection	
1 in. 150 lb or 300 lb raised face threaded ANSI B16.5 flange	
2 in. 150 lb or 300 lb raised face threaded ANSI B16.5 flange	
Wetted materials	
Teflon-lined carbon steel pipe, with carbon steel after flanges; 316 stainless steel outer flange (option -21)	
Cable length	
20 ft. (6.1 m)	
Maximum cable length	
100 ft. (30 m)	

Table 3. Temperature and pressure

Flange	Temperature range	Maximum pressure
150 lb	5 to 182 °C (41 to 360 °F)	125 psig (963 kPa [abs])
300 lb		250 psig (1825 kPa [abs])

Table 4. Pressure (for CRN registration only)

Option	Flange	Diameter	Maximum pressure
-01	150 lb	1 in.	125 psig (963 kPa [abs])
-02		2 in.	
-05	300 lb	1 in.	200 psig (1480 kPa [abs])
-06		2 in.	250 psig (1825 kPa [abs])
-01-21	150 lb	1 in.	125 psig (963 kPa [abs])

Table 5. Weight/Shipping weight (Weights are rounded up to the nearest 1 lb or 0.5 kg)

Flange	Diameter	Weight	Shipping weight
150 lb	1 in.	11 lb (5.0 kg)	14 lb (6.5 kg)
300 lb		17 lb (8.0 kg)	20 lb (9.0 kg)
150 lb	2 in.	33 lb (15.0 kg)	37 lb (17.0 kg)
300 lb		35 lb (16.0 kg)	40 lb (18.0 kg)

Instrument Compatibility

For more information regarding compatibility with older instruments please call our Customer Care Department at 855-724-2638.

Rosemount 56, 1056, and 1066

Measurement choices: Conductivity, resistivity, total dissolved solids, salinity, and % concentration

Salinity: Uses Practical Salinity Scale

Total Dissolved Solids: Calculated by multiplying conductivity at 25 °C by 0.65

% Concentration Selections [1]**:** 0-12% NaOH, 0-15% HCl, 0-20% NaCl, and 0-25% or 96-99.7% H_2SO_4

Temperature Compensation Options: Manual slope (X%/°C) and neutral salt (dilute sodium chloride)

Repeatability: ± 0.25% ± 5 µS/cm after zero cal

Input Filter: Time constant 1-999 seconds, default 2 seconds

Response Time: 3 seconds to 100% of final reading

Table 6. Rosemount 56, 1056, and 1066 Transmitter temperature specifications

Temperature range	-25 to 210 °C (-13 to 410 °F)
Temperature accuracy, Pt-100, -25 to 50 °C	± 0.5 °C
Temperature accuracy, Pt-100, 50 to 210 °C	± 1 °C

Table 7. Transmitter loop performance with Rosemount 222 Sensors

Transmitter model	Conductivity range	Loop performance (following calibration)
Rosemount 1056/56	500 µS/cm to 2000 mS/cm	± 4% of reading in recommended range
Rosemount 1066		± 4% of reading ± 5 mS/cm in recommended range

Table 8. Rosemount 1066 Transmitter loop performance with Rosemount 222 Sensors

Conductivity range	Loop performance (following calibration)
15 µS/cm to 1500 mS/cm	± 1% of reading ± 15 µS/cm in recommended range
1500 mS/cm to 2000 mS/cm	± 5% of reading outside high recommended range

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1.   The conductivity concentration algorithms for these solutions are fully temperature compensated.

Rosemount 5081

Table 9. Rosemount 5081 Transmitter specifications at 25 °C

Accuracy	± 1.0% of reading
Repeatability	± 0.25% of reading
Stability	0.25% of output range per month, non-cumulative
Ambient temperature coefficient	± 0.1% of reading ± 2 μS/cm per °C

Table 10. Recommended conductivity ranges for Rosemount 222 Sensor with Rosemount 5081 Transmitter

Nominal cell constant	6.0/cm (1 in.) or 4.0/cm (2 in.)
Minimum conductivity	500 μS/cm
Maximum conductivity	2,000,000 μS/cm

Note: Values shown are for 25° conductivity with a temperature slope of 2% per °C. The maximum range value will be lower for solutions with a higher temperature slope.

Dimensional Drawings

Figure 1. Rosemount 222 Dimensional Drawing

1-inch diameter sensor

2-inch diameter sensor
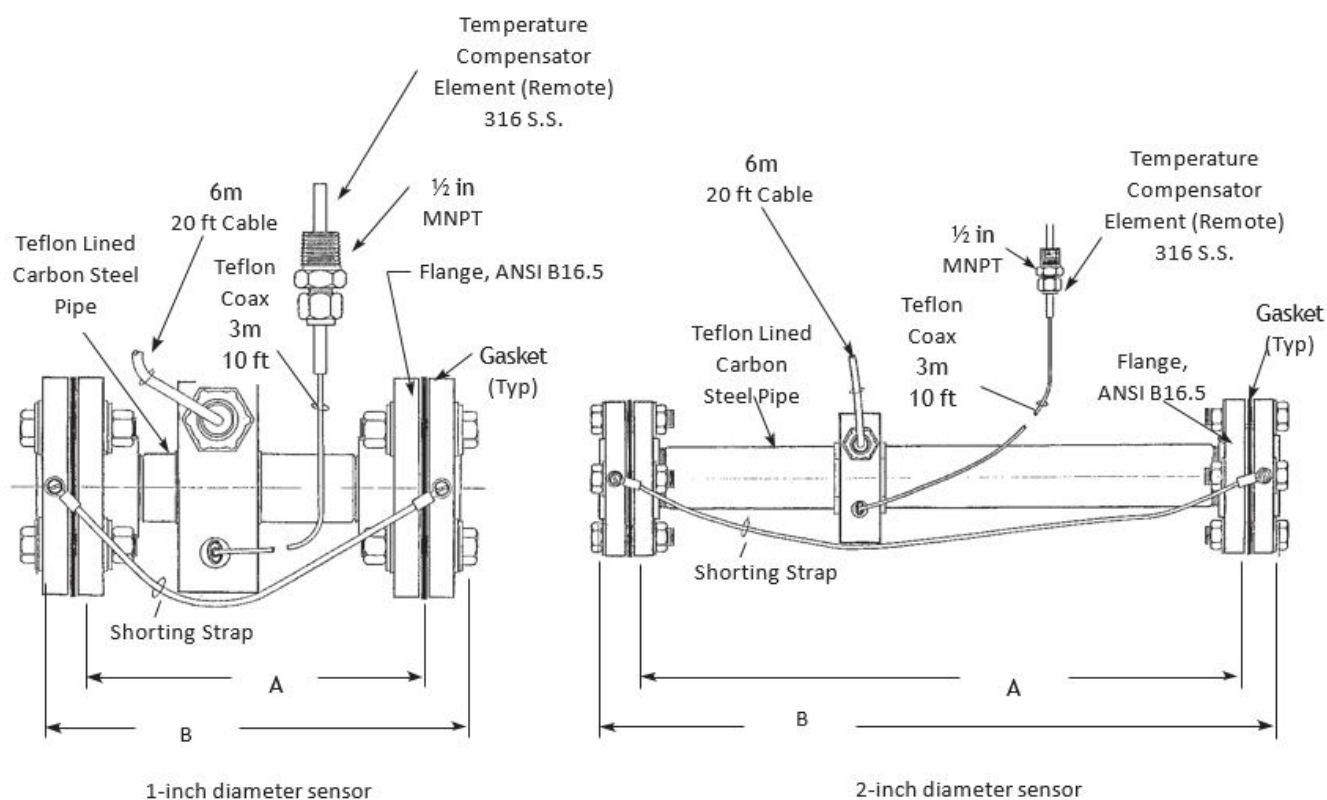
Table 11. Dimensions

Option	Pipe Diameter	Flange [1]	"A" Dimension [2]	"B" Dimension [3]
-01	1 in.	150 lb	7.0 in. (178 mm)	8.4 in. (213 mm)
-02	2 in.	150 lb	24.0 in. (610 mm)	26.0 in. (660 mm)
-05	1 in.	300 lb	7.0 in. (178 mm)	9.1 in. (232 mm)
-06	2 in.	300 lb	24.0 in. (610 mm)	26.6 (676 mm)
-01-21	1 in.	150 lb	7.0 in. (178 mm)	8.4 in. (213 mm)

1.   Outside flanges are ANSI B16.5 raised face, threaded pipe flanges
2.   Dimension is +0.125 in. (3 mm)
3.   Approximate dimension

Accessories

Table 12. Rosemount 222 Sensor accessories information

Part number	Description
2001492	Stainless steel tag (must specify marking)
23550-00	Remote junction box without preamplifier
23294-00	Interconnecting extension cable, unshielded, prepped (for use with remote junction box)
23294-05	Interconnecting extension cable, shielded, prepped (for use with remote junction box)
9200276	Interconnecting extension cable, shielded, unprepped (for use with remote junction box)
2002557	Insulation kit, 1 in. 150 lb flange, 2 sets [1]
2002558	Insulation kit, 1 in. 300 lb flange, 2 sets [1]
2002559	Insulation kit, 2 in. 150 lb flange, 2 sets [1]
2002560	Insulation kit, 2 in. 300 lb flange, 2 sets [1]
8950101	Pt-100 RTD assembly
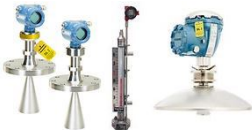
1.   Each insulation kit contains two flange gaskets and sufficient insulating sleeves, insulating washers, and stainless steel washers to replace both flange seals of one sensor. The kit does not contain flange bolts or nuts.

HIGH ACCURACY
measurement instruments

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