Product Data Sheet
June 2017
LIQ-PDS-140

Rosemount™ 140/141/142

Contacting Conductivity Sensors

Make reliable conductivity measurements with Rosemount 140 series conductivity sensors

Rosemount 140, 141, and 142 sensors are contacting conductivity sensors used for measuring electrolytic conductivity in applications ranging from high purity water to clean cooling water. These sensors are ideal for use in clean, non-corrosive water having conductivity less than about 20,000 µS/cm.

ROSEMOUNT™

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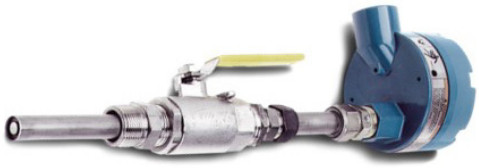
Overview



Retractable Rosemount 140

- Perform maintenance and replace sensors easily by removing the sensor from process piping without having to shut down and drain the line or vessel.
- Compatible with 1 in. full port ball valves (sold separately).

Versatile Rosemount 141 and 142

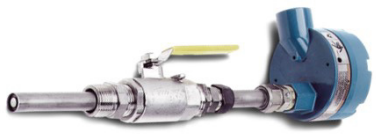
- ¾ in. MPT process connections for screw-in type installation.

Robust Sensor Construction

- High temperature options allow sensors to be used in process temperatures up to 200 °C.
- Easily wire sensors to transmitters through an integral cast aluminum junction box.

Contents

Ordering Information



The Rosemount 140 contacting conductivity sensor is a retractable type sensor used to measure conductivity in process liquids having moderately high conductivity. Sensors are available in 0.2/cm and 1.0/cm cell constants. Interconnecting cable and ball valve/retraction assembly must be ordered separately.

Table 1. Rosemount140 Contacting Conductivity Sensor ordering information

Model	Sensor type
140	Contacting Conductivity Sensor
Cell Constant and Temperature Construction	
54	0.2/cm cell constant – Standard temperature up to 150 °C
55	0.2/cm cell constant – High temperature up to 200 °C
56	1.0/cm cell constant – Standard temperature up to 15 0 °C
57	1.0/cm cell constant – High temperature up to 200 °C
Typical Model Number:140-56	

The Rosemount 141 contacting conductivity sensor is a screw in type sensor available with 0.2/cm and 1.0/cm cell constants. Interconnecting cable for wiring between sensor junction box and transmitter is sold separately.

Table 2. Rosemount141 Contacting Conductivity Sensor ordering information

Model	Sensor type
141	Contacting Conductivity Sensor
Cell constant	
04	0.2/cm cell constant
06	1.0/cm cell constant
Temperature construction	
13	Standard temperature up to 150 °C
14	High temperature up to 200 °C
RTD	
54	Pt-100
Typical model number:141-06-14-54	

The Rosemount 142 contacting conductivity sensor is a screw in type sensor available with 0.01/cm and 0.1/cm cell constants. Interconnecting cable for wiring between sensor junction box and transmitter is sold separately.

Table 3. Rosemount142 Contacting Conductivity Sensor ordering information

Model	Sensor type
142	Contacting Conductivity Sensor
Cell constant	
01	0.01/cm cell constant
03	0.1/cm cell constant
Temperature construction	
13	Standard temperature up to 150 °C
14	High temperature up to 200 °C
RTD	
54	Pt-100
Typical Model Number: 142-01-13-54	

Specifications

Table 4. Rosemount 140 contacting conductivity sensor specifications

Cell constants	
0.1 and 1.0/cm (nominal, to within +/- 5%)	
Wetted materials	
Electrodes	316 stainless steel
Body	316 stainless steel
Insulator	PEEK
O-rings	Viton
Temperature range	
Standard	32 °F to 302 °F (0 °C to 150 °C) maximum
High temperature	32 °F to 392 °F (0 °C to 200 °C) maximum
Pressure	
100 psig (791 kPa abs) maximum	
Maximum retraction pressure	
100 psig (791 kPa abs)	
Vacuum	
At 1.6 in. Hg (5.2 kPa) air leakage is less than 0.005 SCFM (0.00014 m^3/min)	
Junction box	
Cast aluminum	
Process connection	
1 in. MPT through 1inch full port ball valve (retractable)	
Weight/shipping weight	
5 lb /6 lb (2.5 kg / 3.0 kg) Weights rounded up to nearest whole lb or 0.5 kg	

Table 5. Rosemount 141 contacting conductivity sensor specifications

Cell constants	
0.2 and 1.0/cm (nominal, to within +/- 5%)	
Wetted materials	
Electrodes	316 stainless steel
Body	316 stainless steel
Insulator	PEEK
O-rings	Viton
Temperature and pressure	
See Figure 1 on page 7	
Vacuum	
At 1.6 in. Hg (5.2 kPa) air leakage is less than 0.005 SCFM (0.00014 m^3/min)	
Junction box	
Cast aluminum	
Process connection	
¾ in. MPT	
Weight/shipping weight	
2 lb / 3 lb (1.0 kg / 1.5 kg) Weights rounded up to nearest whole lb or 0.5 kg	

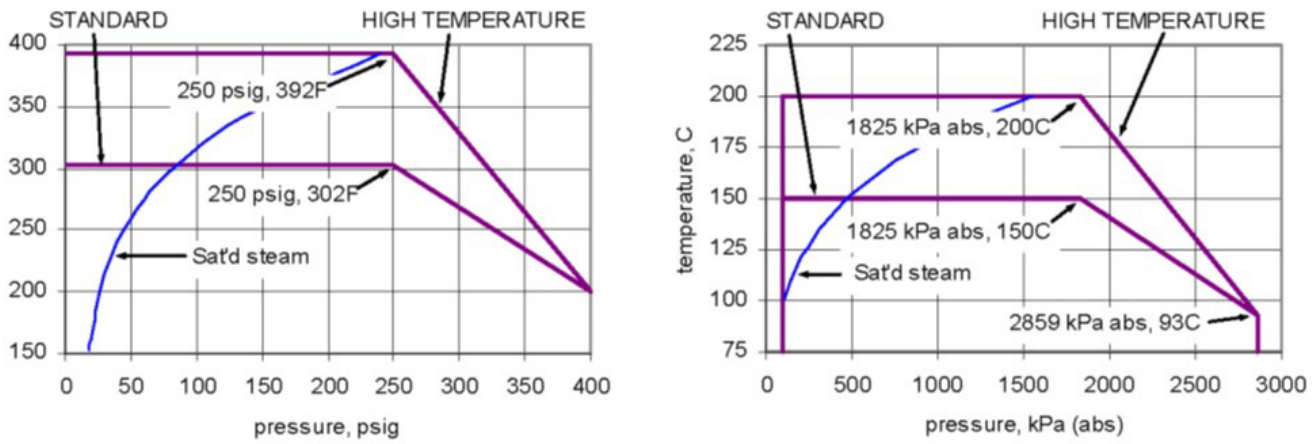
Table 6. Rosemount 142 contacting conductivity sensor specifications

Wetted materials	
Electrodes	316 stainless steel
Body	316 stainless steel
Insulator	PEEK (high temperature option)
	PCTFE (low temperature option)
O-rings	Viton
Temperature and pressure	
See Figure 1 on page 7	
Vacuum	
At 1.6 in. Hg (5.2 kPa) air leakage is less than 0.005 SCFM (0.00014 m^3/min)	
Junction box	
Cast aluminum	
Process connection	
¾ in. MPT	
Weight/shipping weight	
2 lb / 3 lb (1.0 kg / 1.5 kg) Weights rounded up to nearest whole lb or 0.5 kg	

Table 7. Specifications for Ball Valve Kit PN 23724-00

Wetted Materials
316 stainless steel except Teflon® seat and seals in ball valve

Figure 1. Rosemount 141 and 142 sensor pressure/temperature graphs



Dimensional and Installation Drawings

Figure 2. Rosemount 140 sensor dimensional drawing

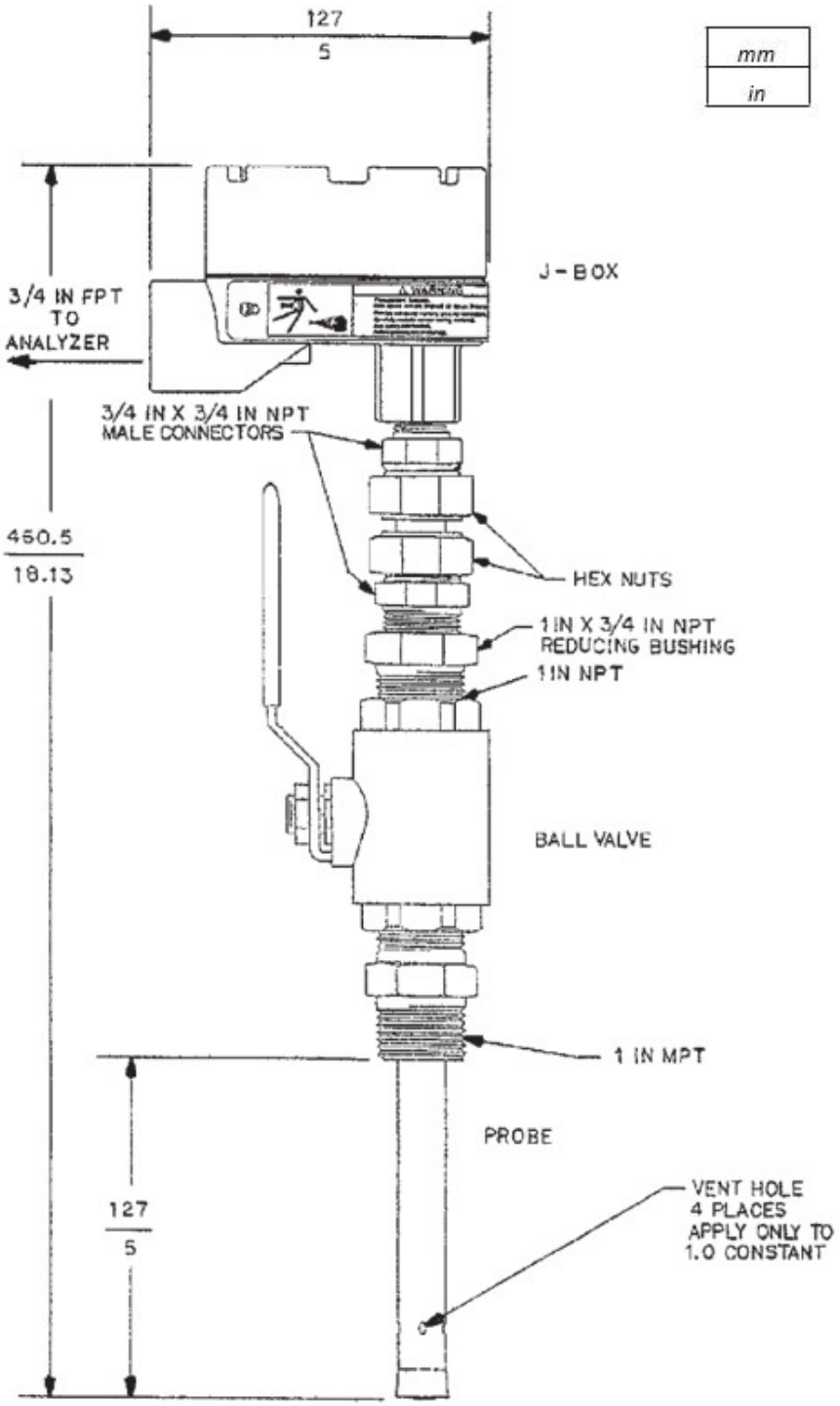
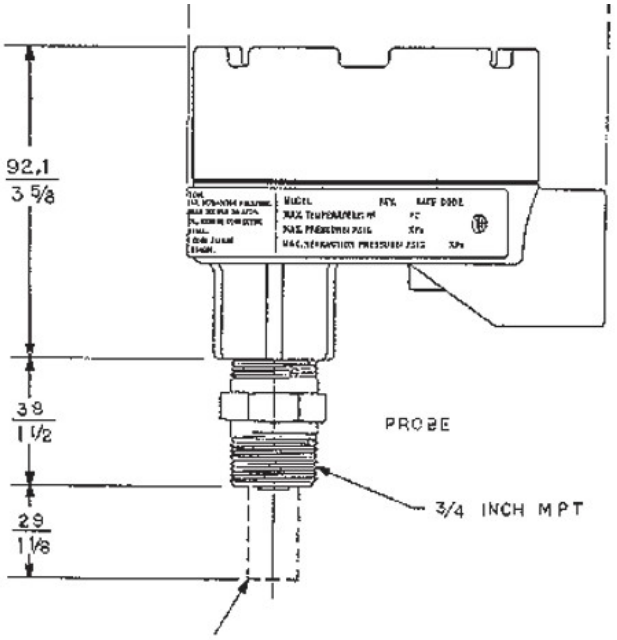


Figure 3. Rosemount 141 sensor dimensional drawing



Note: The tip of the 141-06 sensor extends 1.in. below the bottom of the threads. The tip of the 141-06 sensor is even with the bottom threads.

Figure 4. Rosemount 142 sensor dimensional drawing

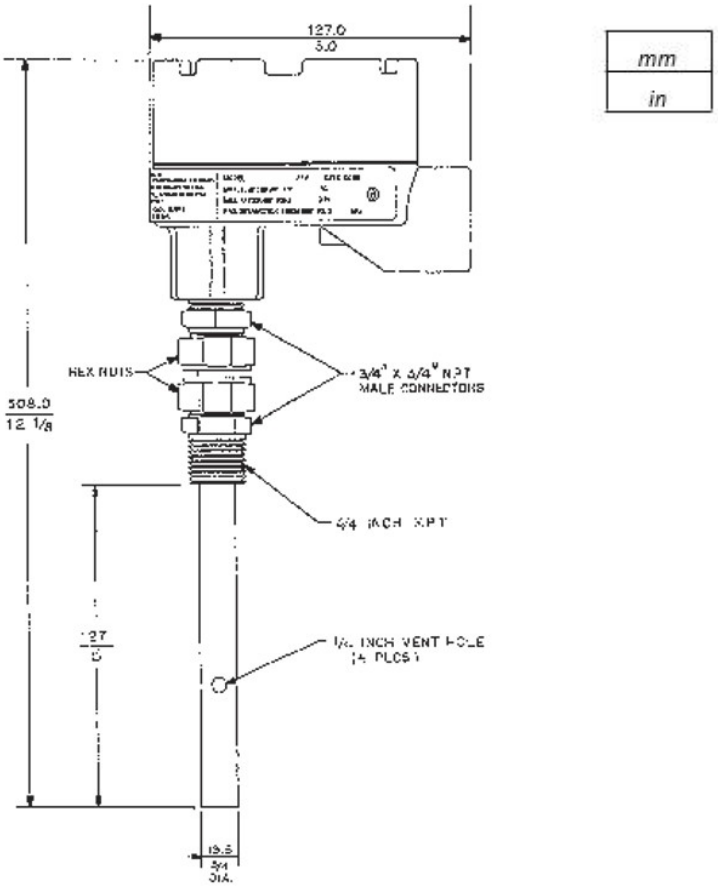
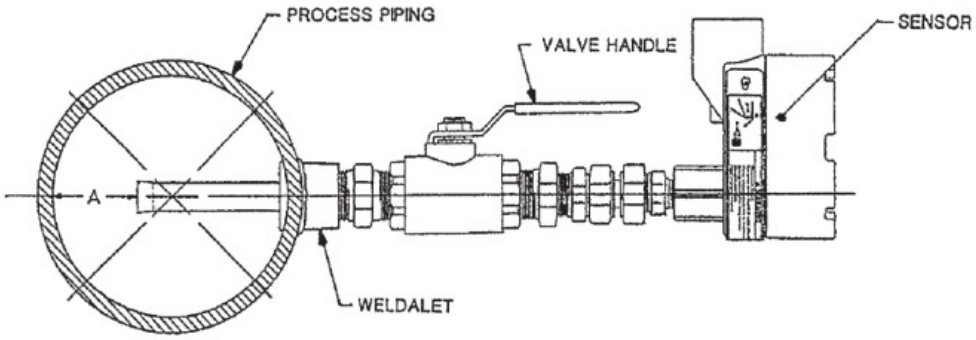


Figure 5. Installation details for Rosemount 140 sensor



A to be 1 in. or more from vessel wall

Figure 6. Installation details for Rosemount 141 sensor

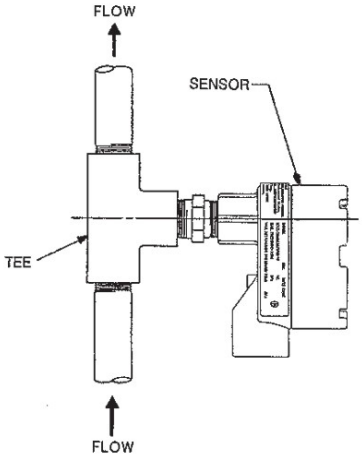
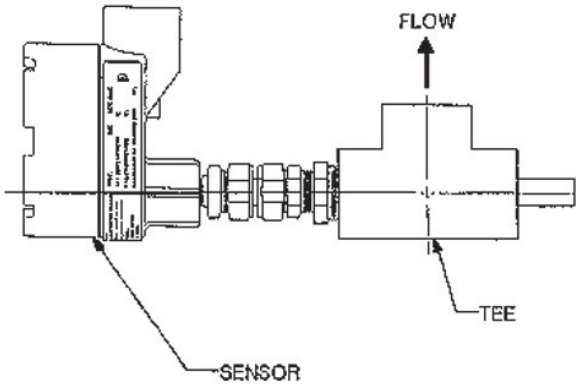


Figure 7. Installation details for Rosemount 142 sensor



Accessories

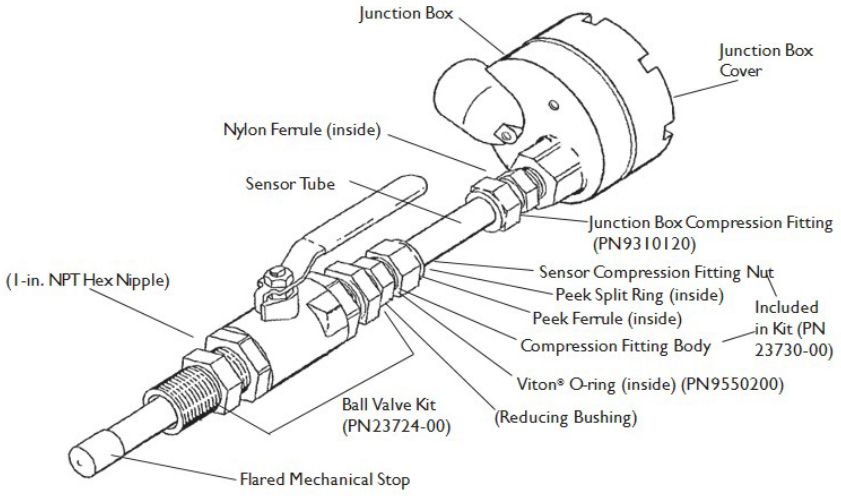
Table 8. Rosemount 140/141/142 Sensor accessories information

Part number	Description
23550-00	Junction box for remote cable connection
9200275	Connecting cable, unterminated, specify length
23747-00	Connecting cable, terminated, specify length
05010781899	Conductivity standard SS-6, 200 µS/cm, 32 oz. (0.95 L)
05010797875	Conductivity standard SS-6A, 200 µS/cm, 1 gal (3.78 L)
05010782468	Conductivity standard SS-5, 1000 µS/cm, 32 oz (0.95 L)
05010783002	Conductivity standard SS-5A, 1000 µS/cm, 1 gal (3.78 L)
05000705464	Conductivity standard SS-1, 1409 µS/cm, 32 oz (0.95 L)
05000709672	Conductivity standard SS-1A, 1409 µS/cm, 1 gal (3.78 L)
05010782147	Conductivity standard SS-7, 5000 µS/cm, 32 oz (0.95 L)
05010782026	Conductivity standard SS-7A, 5000 µS/cm, 1 gal (3.78 L)

Table 9. Rosemount 140 Sensor accessories information

Part number	Description
23724-00	Ball valve kit
23730-00	Process compression fitting, ¾ in. NPT
23731-00	Process fitting rebuild kit
9310120	Junction box compression fitting
9550200	O-ring® 2-116, Viton®

Figure 8. Rosemount 140 with Ball Valve Kit (PN 23724-00)



Rosemount 140 Sensor with Ball Valve Kit (PN 23724-00)

Table 10. Rosemount 142 Sensor accessories information

Part number	Description
33107-01	Compression fitting, ¾ in.
9310063	Ferrule, ¾ in.
9310066	Compression nut, ¾ in.

Notes:

Notes:

Notes:

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Product Data Sheet
00813-0100-3400, Rev AD
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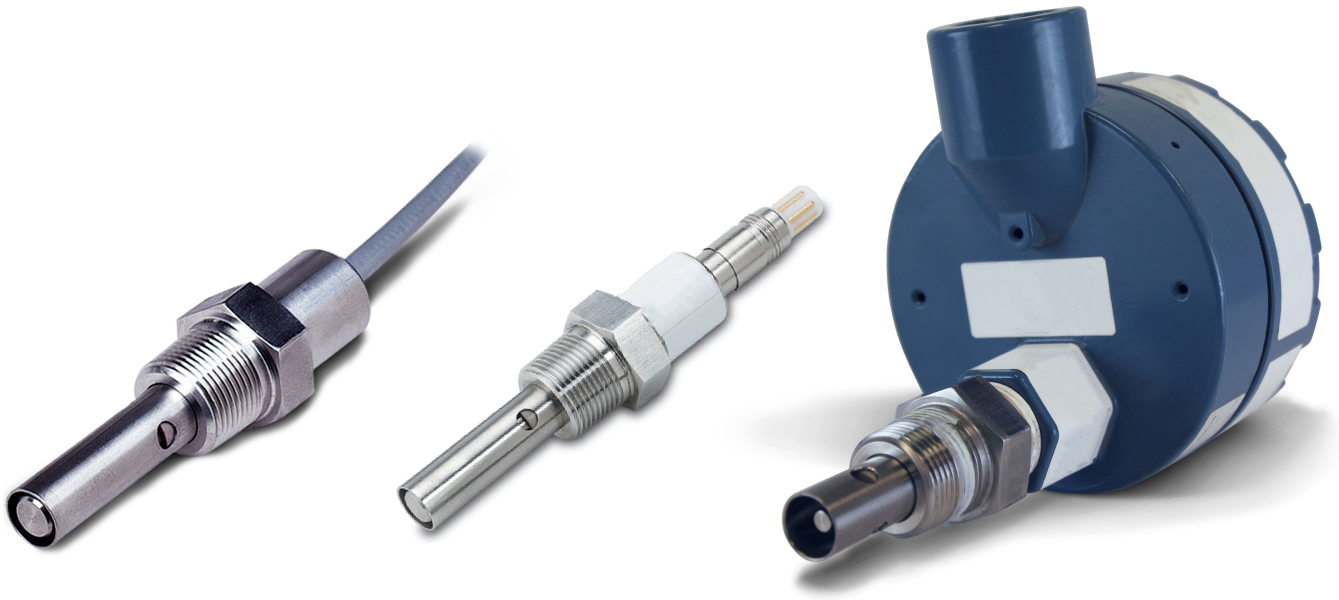
Rosemount™ 400 and 400VP

Contacting Conductivity Sensors



Reliable conductivity measurements for your process

With Rosemount 400 and 400VP contacting conductivity sensors, you can accurately measure electrolytic conductivity in a broad range of applications from high purity water to clean cooling water. These sensors are ideal for use in clean, non-corrosive liquid having conductivity less than 20,000 µS/cm.

Overview

Minimize start-up and installation time.

- A factory-measured cell constant ensures out-of-the-box accuracy and no initial calibration requirements.
- Available in cell constants of:
  - 0.01/cm
  - 0.1/cm
  - 1.0/cm

Contents

Meet your process mounting needs.

- The sensors are designed for direct screw-in insertion into process piping using a front facing ¾ in. male national pipe thread (MNPT) fitting.
- Can alternatively be used with a pipe tee or flow cell in a sidestream installation.
- Offered with Variopol (VP6) quick disconnect fittings.

A robust two-electrode design.

- The sensors have concentric titanium electrodes separated by a polyether ether ketone (PEEK) insulator.
- A Viton® O-ring seals the internal parts of the sensor from the process liquid.
- Available with a high temperature option up to 392 °F (200 °C) with integral junction box.

Ordering information

The Rosemount 400/400VP contacting conductivity sensors are intended to measure electrolytic conductivity in clean water applications. You can configure these sensors with a 0.01/cm, 0.1/cm, or 1.0/cm to accommodate varying levels of conductivity. The sensors are available with either an integral cable connection or Variopol (VP6) connector. Variopol cables sold separately (see Accessories).

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Rosemount 400 Contacting Conductivity Sensor ordering information

Note

The Endurance™ Rosemount 400 screw-in conductivity sensors consist of titanium electrodes and a ¾-in. (19.1 mm) stainless steel process connector. Maximum temperature range for the standard sensor is 221 °F (105 °C) with an option for use in applications up to 392 °F (200 °C).

Model

Code	Description
400	Conductivity sensor - Endurance™ screw-in

Cell constant

Code	Description
11	0.01/cm
12	0.1/cm
13	1.0/cm

Temperature compensation

Code	Description
_	Pt-1000 (standard) for Rosemount 1056, 1066-C, 56, and 5081-C
54	Pt-100 for Rosemount 1054 and series 2081

Electrode extension insertion length

Code	Description
_	No selection
36	Extended insertion length(1)

(1) *5.5 in. (139.7 mm) from the bottom of threads to tip of sensor*

Cable length

Code	Description
_	No selection
50	Integral 50-ft. (15 m) cable
60	Integral junction box for high temperature and special general purpose application
02	Integral 15-ft. (4.6 m) cable
20	Integral 20-ft. (6 m) cable
03	Integral 33-ft. (10 m) cable
06	Integral 100-ft. (30 m) cable

Calibration and conformance certificates - optional level

Code	Description
CC	Certificate of Calibration (no test data given)
LC	Loop Calibration Certificate (sensor and transmitter calibrated together with test data)
EC	Electronic Calibration Certificate (sensor calibrated against factory instrument with test data)

Rosemount 400VP Contacting Conductivity Sensor ordering information

Note
An integral six pin Variopol (VP6) connector is standard and must be installed with a mating VP connector cable. The standard Rosemount 400VP sensor is compatible with Rosemount 5081-X, 1056, 1057, and 56. To make the sensor compatible with other transmitters, use code -54.

Model

Code	Description
400VP	Conductivity sensor - Endurance™ screw-in Variopol connector

Cell constant

Code	Description
11	0.01/cm
12	0.1/cm
13	1.0/cm

Temperature compensation

Code	Description
_	Pt-1000 (standard) for Rosemount 1055, 1056, 1066-C, 54C, 54eC, 4081-C, 5081-C, 6081-C, and Xmt-C
54	Pt-100 for Rosemount 1054 and series 2081

Electrode extension insertion length

Code	Description
_	No selection
36	Extended insertion length(1)

(1) *5.5 in. (139.7 mm) from the bottom of threads to tip of sensor*

Calibration and conformance certificates - optional level

Code	Description
CC	Certificate of Calibration (no test data given)
LC	Loop Calibration Certificate (sensor and transmitter calibrated together with test data)
EC	Electronic Calibration Certificate (sensor calibrated against factory instrument with test data)

Accessories

Part number	Description
23747-06	Junction box for a remote cable connection
9200275	Connecting cable, unterminated, specify length
23747-00	Connecting cable, terminated, specify length
24091-02	Low flow cell for Rosemount 400/400VP sensors
05010781899	Conductivity standard SS-6, 200 µS/cm, 32 oz. (0.95 L)
05010797875	Conductivity standard, SS-6A, 200 µS/cm, 1 gal. (3.78 L)
05010782468	Conductivity standard, SS-5, 1000 µS/cm, 32 oz. (0.95 L)
05010783002	Conductivity standard SS-5A, 1000 µS/cm, 1 gal. (3.78 L)

Part number	Description
05000705464	Conductivity standard, SS-1, 1409 µS/cm, 32 oz. (0.95 L)
05000709672	Conductivity standard, SS-1A 1409 µS/cm, 1 gal. (3.78 L)
05010782147	Conductivity standard SS-7, 5000 µS/cm, 32 oz. (0.95 L)
05010782026	Conductivity standard SS-7A, 5000 µS/cm, 1 gal. (3.78 L)
23747-06	2.5-ft. (0.8 m) interconnecting VP6 cable
23747-04	6.4-ft. (1.2 m) interconnecting VP6 cable
23747-02	10-ft. (3.0 m) interconnecting VP6 cable
23747-07	15-ft. (4.6 m) interconnecting VP6 cable
23747-08	20-ft. (6.1 m) interconnecting VP6 cable
23747-09	25-ft. (7.6 m) interconnecting VP6 cable
23747-10	30-ft. (9.1 m) interconnecting VP6 cable
23747-03	50-ft. (15.2 m) interconnecting VP6 cable
23747-11	100-ft. (30.5 m) interconnecting VP6 cable

Specifications

Wetted materials	
Electrodes	Titanium
Insulator	Glass filled polyether ether ketone (PEEK)
BodyHex block	316 stainless steel
O-ring	Viton®
Surface finish	- Inner electrode = 16 Ra - Outer electrode = 32 Ra (Options 13/17 = 16 Ra) - Insulator = 32 Ra - Wetted hex nut = No surface roughness
Temperature range	
Standard	32 to 221 °F (0 to 105 °C)
With optional integral junction box	32 to 392 °F (0 to 200 °C)
Maximum pressure	
250 psig (1825 kPa [abs])	
Vacuum	
At 1.6-in. Hg (5.2 kPa), air leakage is less than 0.005 SCFM (0.00014 m3/min.)	
Cell constants	
0.01, 0.1, and 1.0/cm	
Process connection	
¾-in. Male National Pipe Thread (MNPT)	
Cable length	
10-foot standard; for longer cable lengths, choose option -60 (integral junction box) and order interconnecting cable separately; interconnecting VP6 cables sold separately (see Accessories).	

Figure 1: Recommended Range - Contacting Conductivity

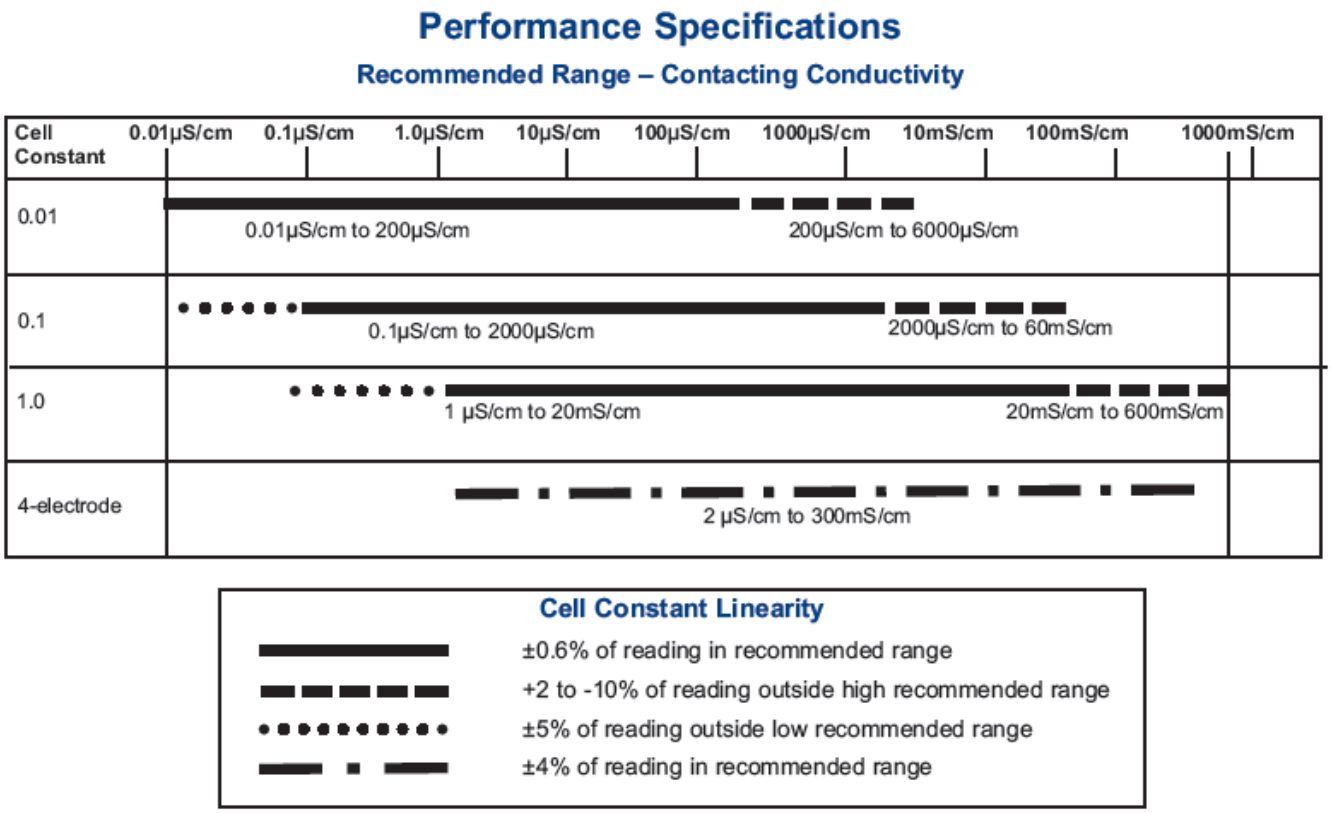


Table 1: Weights and Shipping Weights

Rounded up to the nearest 1 lb. or 0.5 kg.

Sensor	Weight	Shipping weight
Rosemount 400 with 10-ft. integral cable	1 lb. (0.5 kg)	2 lb. (1.0 kg)
Rosemount 400 with 50-ft. integral cable	4 lb. (2.0 kg)	5 lb. (2.5 kg)
Rosemount 400VP with Variopol cable connection	1 lb. (0.5 kg)	2 lb. (1.0 kg)
Rosemount 400 with integral junction box	3 lb. (1.5 kg)	4 lb. (2.0 kg)

Figure 2: Flow Cell

Flow Cell (24092-02) Specifications

Wetted materials	**Body and nut**	Polycarbonate and polyester
	¼ in. (6.4 mm) fittings	316 stainless steel
	O-ring	Silicone
Process connection	Compression fittings for ¼ in. (6.4 mm) OD tubing	
Temperature range	32 to 158 °F (0 to 70 °C)	
Maximum pressure	90 psig (722 kPa [abs])	

Retraction Assembly Specifications

Assembly includes	Ball valve Retraction body Pipe nipple	
Wetted materials	**Ball valve**	316 stainless steel with PTFE seals and seat steel
	Nipple	316 stainless steel
	Packing rings	Graphite
	Packing bushing	303 stainless steel
	Retraction body	316 stainless steel
Process connection	Ball valve: 1¼-inch female national pipe thread (FNPT) Nipple: 1¼-inch male national pipe thread (MNPT)	
Temperature	32 to 212 °F (0 to 100 °C)	
Pressure	200 psig (1481 kPa [abs]) maximum	
Maximum retraction pressure	64 psig (542 kPa [abs]) maximum	
Vacuum	AT 1.6 inHg (5.2 kPa), air leakage is less than 0.005 SCFM (0.00014 m^3/min).	

Engineering specifications

Cell constants 0.01, 0.1, and 1.0/cm

The sensor shall:

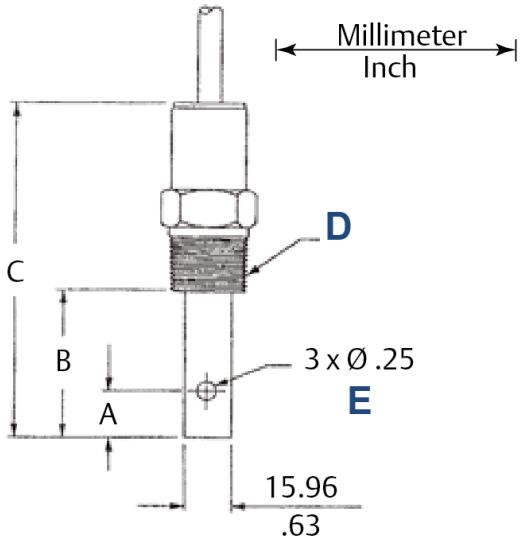
- be suitable for the determination of electrolytic conductivity in clean, non-corrosive samples.
- have a ¾-inch male national pipe thread (MNPT) fitting for direct insertion into pipes or tees. A clear plastic flow cell shall also be available for side-stream samples.
- be available with either integral cable or a Variopol quick disconnect fitting.
- be suitable for vacuum service as low as 1.6 inHg
- be Rosemount 400 (integral cable) or 400VP (Variopol fitting) or approved equal.
- incorporate titanium electrodes and a polyether ether ketone (PEEK) insulator.
- have an integral platinum resistance temperature device (RTD) for temperature measurement.

In addition,:

- The maximum temperature for the sensor shall be 105 °C at 250 psig. A high temperature option that can be used at 200 °C shall also be available.

Dimensional drawings

Figure 3: Rosemount 400 with Integral Cable Connection Dimensional Drawing

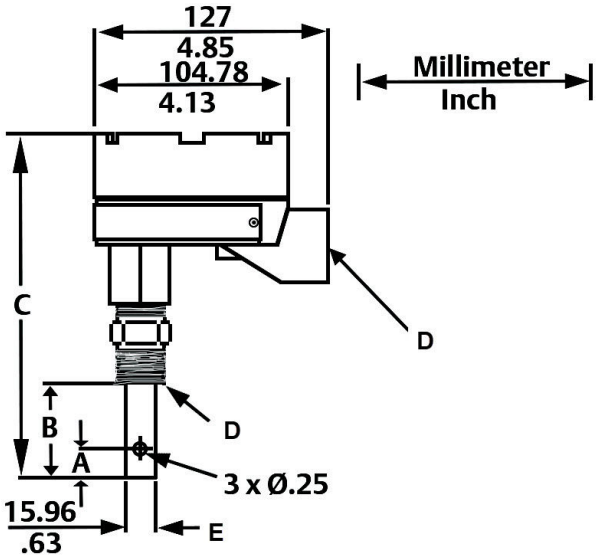


A. Dimension (see Table 2)
B. Dimension (see Table 2)
C. Dimension (see Table 2)
D. ¾-in. -14 national pipe thread (NPT)
E. Equally spaced

Table 2: Rosemount 400 with Integral Cable Dimensions

Sensor configuration	A		B		C	
	in.	mm	in.	mm	in.	mm
0.01/cm	1.59	40.39	1.98	50.34	4.52	114.8
0.1/cm	0.687	17.45	1.11	28.15	3.65	92.71
1.0/cm	0.667	16.94	1.13	28.70	3.65	92.71
0.01/cm (with extended insertion length)	1.59	40.39	5.49	139.4	8.00	203.2
0.1/cm (with extended insertion length)	0.687	17.45	5.49	139.4	8.00	203.2
1.0/cm (with extended insertion length	0.667	16.94	5.49	139.4	8.00	203.2

Figure 4: Rosemount 400 with Integral Junction Box Dimensional Drawing

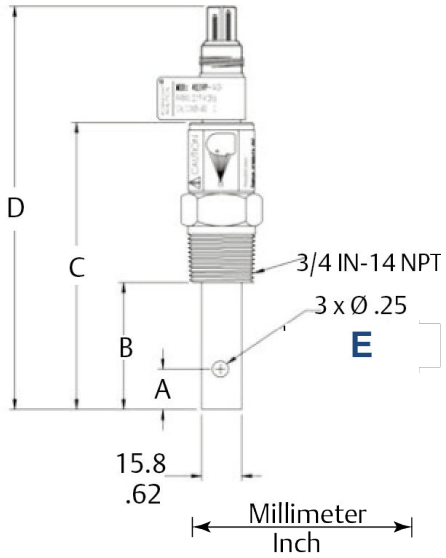


A. Dimension (see Table 3)
B. Dimension (see Table 3)
C. Dimension (see Table 3)
D. ¾-in.-14 NPT
E. Equally spaced

Table 3: Rosemount 400 with Integral Junction Box Dimensions

Sensor configuration	A		B		C	
	in.	mm	in.	mm	in.	mm
0.01/cm	1.59	40.39	1.98	50.34	7.41	188.2
0.1/cm	0.687	17.45	1.11	28.15	6.49	164.9
1.0/cm	0.667	16.94	1.13	28.70	6.51	165.4
0.01/cm (with extended insertion length)	1.59	40.39	5.49	139.4	10.90	276.9
0.1/cm (with extended insertion length)	0.687	17.45	5.49	139.4	10.90	276.9
1.0/cm (with extended insertion length	0.667	16.94	5.49	139.4	10.90	276.9

Figure 5: Rosemount 400VP with Variopol Cable Connection Dimensional Drawing

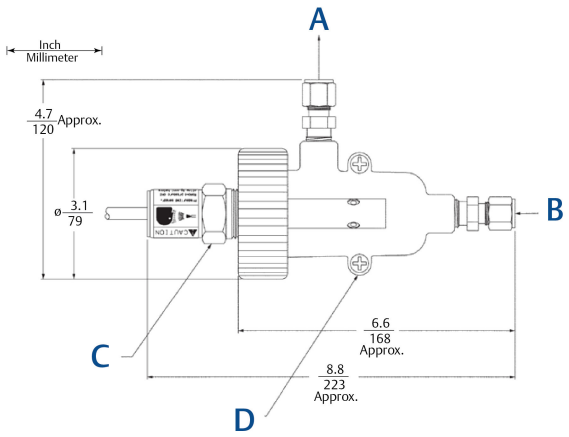


A. *Dimension (see Table 4)*
B. *Dimension (see Table 4)*
C. *Dimension (see Table 4)*
D. *Dimension (see Table 4)*
E. *Equally spaced*

Table 4: Rosemount 400VP with Variopol Cable Connection Dimensions

Sensor configur-ation	A		B		C		D	
	in.	mm	in.	mm	in.	mm	in.	mm
0.01/cm	1.59	40.39	1.98	50.34	4.43	112.5	6.3	160.0
0.1/cm	0.67	17.0	1.10	27.9	3.47	90.4	5.43	137.9
1.0/cm	0.67	17.0	1.10	27.9	3.58	90.9	5.45	138.4
0.01/cm (with extended insertion length)	1.59	40.4	5.48	139.2	7.91	200.9	9.78	248.4
0.1/cm (with extended insertion length)	0.67	17.0	5.48	139.2	7.91	200.9	9.78	248.4
1.0/cm (with extended insertion length	0.67	17.0	5.48	139.2	7.91	200.9	9.78	248.4

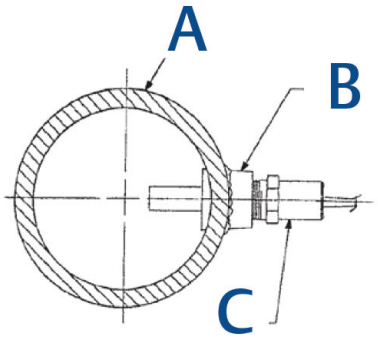
Figure 6: Flow Cell (PN24091-02)



A. Outlet
B. Inlet
C. Rosemount 400
D. Low flow cell (PN 24091-02)

Rosemount 400 with Integral Cable Connection

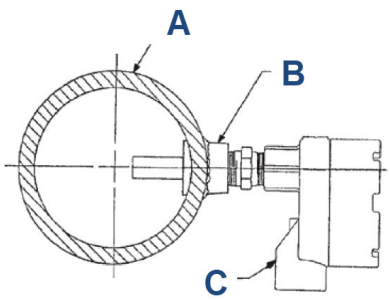
Figure 7: Large Pipe or Tank Installation



You can screw the Endurance™ sensor into a weldolet in either a pipe or large tank.

A. Process piping
B. Weldolet
C. Sensor

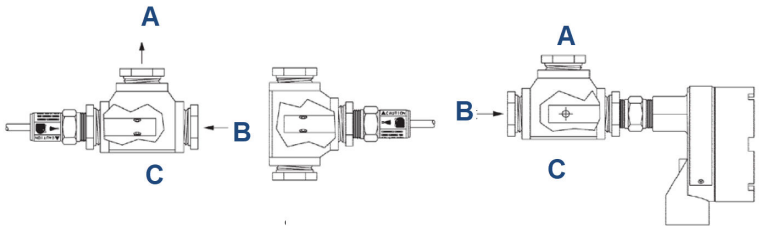
Figure 8: The Junction Box Advantage



Select the optional junction box for installations where a long length of cable must be run through conduit.

A. Process piping
B. Weldolet
C. Sensor

Figure 9: Standard Tee Installation

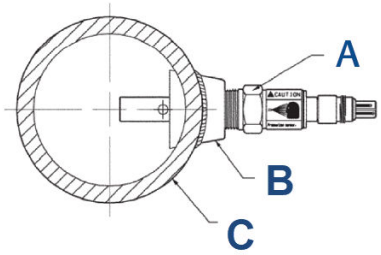


For systems with small diameter piping, install the sensor in a pipe tee. You can also use a pipe tee for sidestream samples. For best performance, orient the sensor with the end facing the liquid flow.

A. Outlet
B. Inlet
C. 1-in. pipe tee with ¾-in. bushing shown

Rosemount 400 with Variopol cable connection

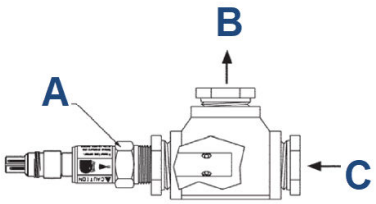
Figure 10: Large Pipe or Tank Installation



You can screw the Endurance sensor into a weldolet in either a large pipe or tank.

A. Sensor
B. Weldolet
C. Process piping

Figure 11: Standard Tee Installation



For systems with small diameter piping, install the sensor in a pipe tee. You can also use a pipe tee for sidestream samples. For best performance, orient the sensor with the end facing the liquid flow.

A. Sensor
B. Outlet
C. Inlet

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For more information: **Emerson.com/global**

ROSEMOUNT™

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Product Data Sheet
00813-0100-3228, Rev AC
May 2023

Rosemount™ 228

Toroidal Conductivity Sensor

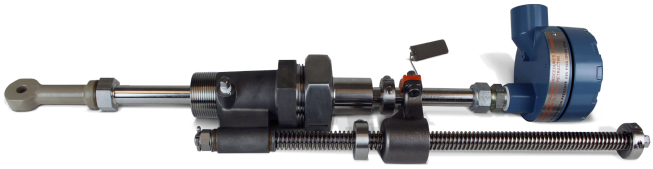
A versatile conductivity sensor for solving diverse application challenges

Rosemount 228 toroidal conductivity sensors reliably measure conductivity in highly conductive electrolyte solutions up to 2 S/cm (2,000,000 µS/cm). These sensors work in dirty and corrosive applications where metal electrode sensors would otherwise fail. A robust sensor design makes the Rosemount 228 ideal for measuring concentrations of acid, base, and salt solutions.

Overview

High-performance and reliability:

- Meet challenging application requirements with a selection of chemical-resistant body options including PEEK and Tefzel®.
- High-vibration tolerance with reinforced internal metal frame design.
- High-temperature option for process temperatures up to 392 °F (200 °C) and suitable for use under high-pressure up to 295 psig (2135 kPa [abs]).



Meet your process mounting needs:

- Suitable for insertion and submersion type applications.
- Versatile mounting options featuring either a ¾-in. MNPT or ⅝-in. 11 UNC process connection.
- Eliminate the need to shut down the process when removing sensors from piping and tanks by using an optional retraction assembly kit.

Ordering information

Rosemount 228 Toroidal Conductivity Sensors are molded of chemically resistant glass filled PEEK or Tefzel™ and are ideal for measuring concentrations of acid, base, and salt solutions. The sensors include an integral PT-100 Resistance Temperature Device (RTD) for temperature compensation and an integral cable length of 20 ft. (6.1 m). The Rosemount 228 can be used with a variety of insertion mounting adapters to meet your installation requirements (see Accessories).

Note

For improved EMI/RFI shielding, choose cable option 56-61 (not for use with the Rosemount 1181T, 1054, and 2054). Allowed combinations for level 3 and 4 are: 54-61, 56-61, and 54-62.

Table 1: Rosemount 228 Toroidal Conductivity Sensor Ordering Information

Option	Description

Contents

Table 1: Rosemount 228 Toroidal Conductivity Sensor Ordering Information *(continued)*

228	Conductivity sensor - toroidal insertion/submersion
Materials of construction	
02	PEEK, standard temperature to 248 °F (120 °C)
Option	**Description**
03	PEEK, high temperature to 391 °F (200 °C)
04	Tefzel®, standard temperature to 248 °F (120 °C)(1)
05	Unfilled Tefzel, standard temperature to 248 °F (120 °C)(2)
20	⅝-11 UNC (EPDM gasket standard), requires mounting adapter
21	¾-in. MNPT threads(3)
Cable Type	
54	Unshielded cable(4)
56	Shielded cable for improved EMI/RFI protection(5)
Cable length	
61	Integral 20-ft. (6.1 m) cable (for use with -54 and -56 options)
62	18 in. (457 mm)(6)
35	Integral 35-ft. (10 m) cable (for use with -54 and -56 options)
04	Integral 50-ft. (15 m) cable (for use with -54 and -56 options)
06	Integral 100-ft. (30 m) cable (for use with -54 and -56 options)
09	Integral 10-ft. (3 m) cable (for use with -54 and -56 options)
Calibration and conformance certificates - optional level	
CC	Certificate of Calibration (no test data given)
LC	Loop Calibration Certificate (sensor and transmitter calibrated together, with test data)
EC	Electronic Calibration Certificate (Sensor calibrated against factory instrument, with test data)
Material traceability certificates (optional level)	
MC	Material Traceability Certification

(1) *Not available with options -50-62 and -54-62.*
(2) *Not available with option -54-62.*
(3) *Not available with option -62.*
(4) *Recommended for use with transmitter models 1054 and 2054. May be used with transmitter models 1056, 1066-T, and 5081, but not recommended.*
(5) *Recommended for use with transmitter models 1056, 1066-T, 56, and 5081.*
(6) *For use with option -54 only. Connects sensor used in valve insertion assembly to junction box. Requires interconnecting cable to connect junction box to transmitter. Use either cable 23294-00 (unshielded) or 23294-05 (shielded).*

Note

The Rosemount 228 sensor is molded from chemically resistant glass-filled PEEK (polyetheretherketone) or glass-filled Tefzel and includes an integral Pt 100 resistance temperature device (RTD) and 20 ft. (6.1 m) of cable. For improved EMI/RFI shielding, choose cable option 56-61 (not for use with the Rosemount 1181T, 1054, and 2054).
Allowed combinations for level 3 and 4 are: 54-61, 56-61, and 54-62.

CONFIGURE > VIEW PRODUCT >

Specifications

Sensor specifications

Cell constant (nominal): 2.7/cm

Wetted materials: Body materials either glass-filled PEEK, glass-filled Tefzel, or unfilled Tefzel. Option -20 has EPDM gasket.

Process connection: -20: 5/8 in. 11 UNC, -21: 3/4 in. MNPT

Standard cable length: 20 ft. (6.1 m)

Weight/shipping weight: 2 lb./3 lb. (1.0 kg/1.5 kg)

Table 2: Maximum Operating Temperature and Pressure

Body material option	Maximum temperature	Maximum pressure	Maximum pressure (for CRN registration only)
-02	248 °F (120 °C)	295 psig (2135 kPa)	220 psig (1618 kPa [abs])
-03	392 °F (200 °C)	295 psig (2135 kPa)	220 psig (1618 kPa [abs])
-04	248 °F (120 °C)	200 psig (1480 kPa)	150 psig (1135 kPa [abs])
-05	248 °F (120 °C)	200 psig (1480 kPa)	150 psig (1135 kPa [abs])

Insertion adapter specifications

Table 3: Maximum Operating Temperature and Pressure

Adapter part number	Sensor compatibility	Process connection	Wetted materials	Maximum temperature	Maximum pressure	Maximum pressure (for CRN registration only)	Weight/ shipping weight
23242-02	For use with option -21	1½-in. MNPT	316 stainless steel, glass-filled PEEK, Viton	392 °F (200 °C)	295 psig (2134 kPa)	220 psig (1618 kPa)	3 lb./4 lb. (1,5 kg/2,0 kg)
23242-03	For use with option -20	1½-in. MNPT	316 stainless steel, glass-filled PEEK, Viton	392 °F (200 °C)	295 psig (2134 kPa)	220 psig (1618 kPa)	3 lb./4 lb. (1,5 kg/2,0 kg)
2001990	For use with option -21	2-in. MNPT	CPVC, Viton	100 °F (38 °C)	100 psig (791 kPa [abs])	N/A	1 lb./2 lb. (0,5 kg/1,0 kg)
				185 °F (85 °C)	45 pisg (412 kPa [abs])		

Retraction assembly specifications

Sensor compatibility: The retraction asemblies are used with 228 -[ ]-20-54-62 only.

Wetted materials: 316 stainless steel, ethylene, polypropylene (EP), unfilled Teflon®, carbon-filled Teflon

Process connection: 1½-in. MNPT

Maximum temperature: 392 °F (200 °C)

Maximum pressure: 295 psig (2135 kPa [abs])

Table 4: Maximum Retraction/Insertion Conditions

Description	Temperature	Pressure	Maximum insertion travel	Weight/shipping weight
23311-00 mechanical retraction assembly	392 °F (200 °C)	295 psig (2135 kPa [abs])	10.5 in. (267 mm)	12 lb./15 lb. (5,5 kg/7,0 kg)
23311-01, manual retraction assembly	130 °C (266 °F)	35 psig (343 kPa [abs])	12.0 in. (305 mm)	9 lb./12 lb. (4,5 kg/5,5 kg)

Ball valve specifications (sold separately)

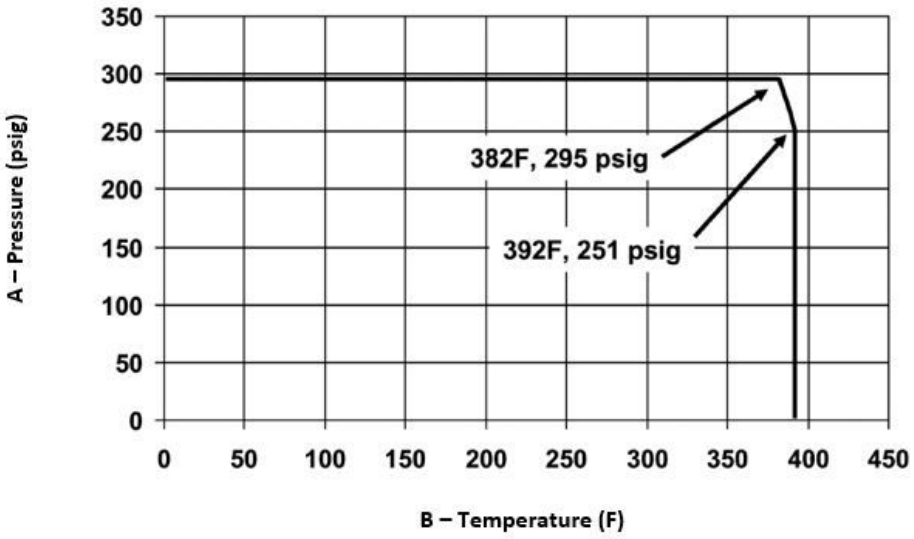
Part number: 9340065

Wetted materials: 316 stainless steel, Teflon TFE

Process connection: 1½-in. FNPT

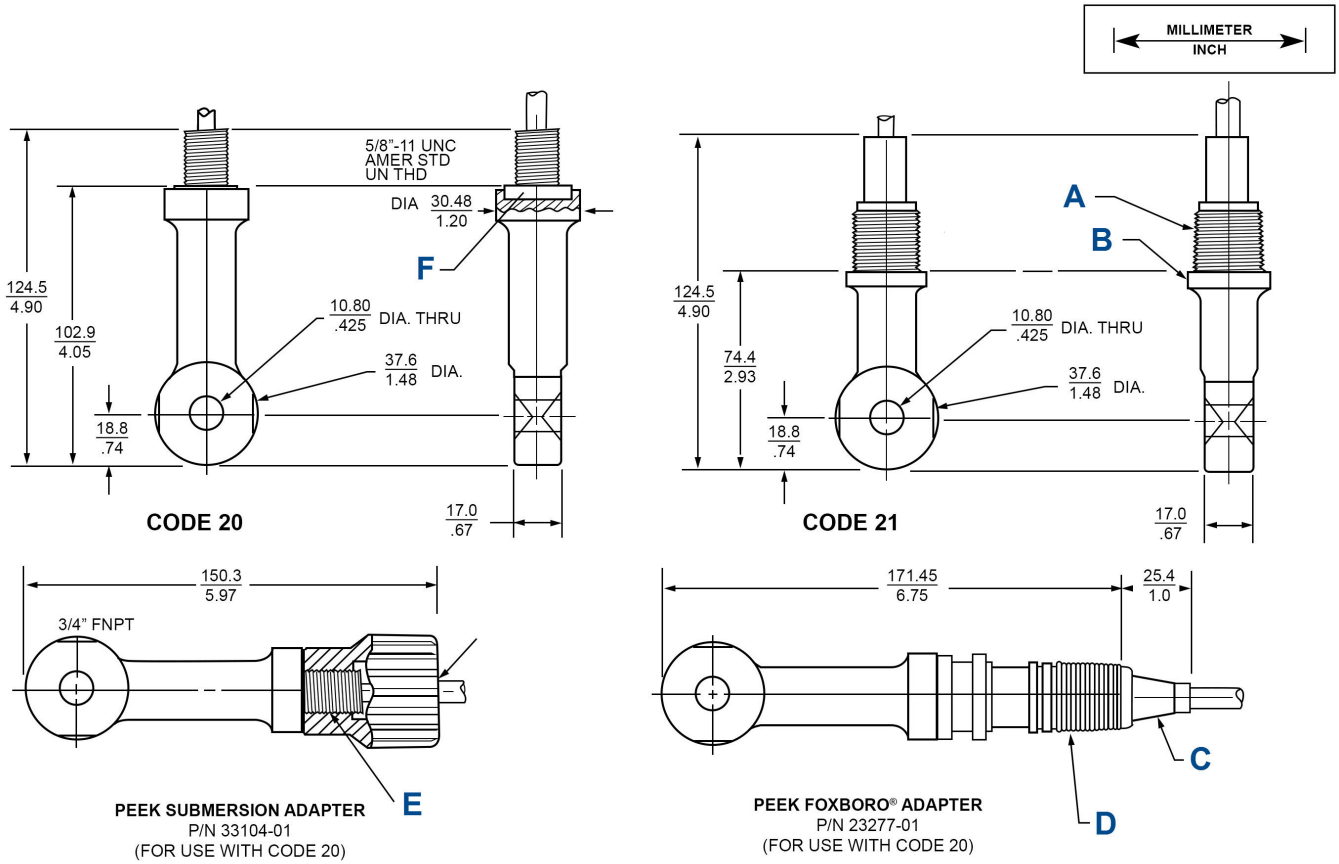
Weight/shipping weight: 4 lb./5 lb. (2,0 kg/2,5 kg)

Figure 1: Pressure and temperature



Dimensional drawings

Figure 2: Rosemount 228 Dimensional Drawing

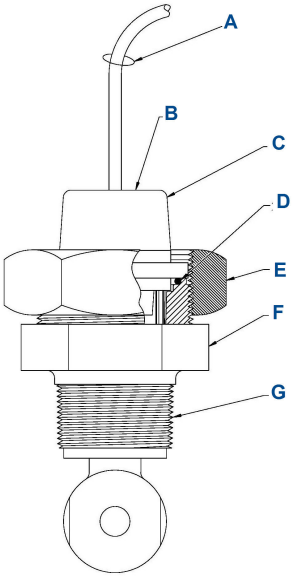


Note

Measurements are expressed with millimeter on the top and inches on the bottom.

A. ¾-in. MNPT
B. 1-in. wrench opening
C. Strain relief boot
D. Foxboro ¾-in. truncated pipe thread
E. Typical thread cutaway for code 20
F. EPDM gasket

Figure 3: Insertion Adapter 23242-02



A. Cable

B. 1-in. FNPT

C. Adapter ¾-in. FNPT thread

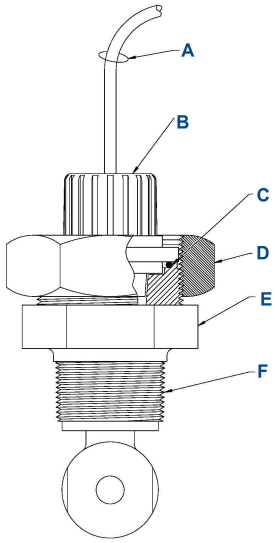
D. 2-135 FKM O-ring

E. Nut, hex union 2 inch

F. Neck, union fitting

G. 1½-in. MNPT

Figure 4: Insertion Adapter 23242-03



A. Cable

B. ¾-in. FNPT

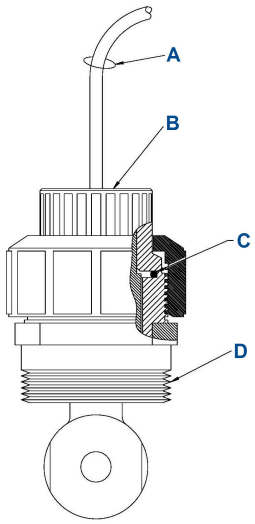
C. 2-135 FKM O-ring

D. Nut, hex union 2-in.

E. Neck, union fitting

F. 1½-in. MNPT

Figure 5: Insertion Adapter 2001990



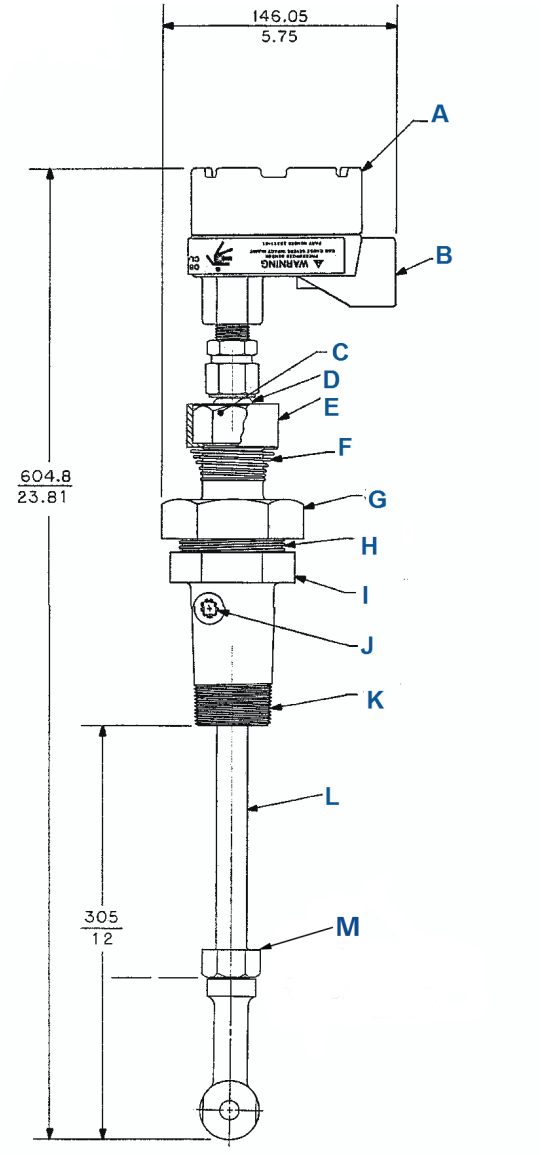
A. Cable

B. ¾-in. FNPT

C. 2-135 Viton O-ring

D. 2-in. MNPT

Figure 6: Manual Retraction Assembly PN 2311-01 Dimensional Drawing



A. Junction box with screw cap

B. ¾-in. FNPT

C. Collet nut

D. Collet

E. Nut guard

F. Nut guard spring

G. 3-in. hex union nut

H. 2.531-in. 8 ACME thread

I. 2⅝-in. hex retraction chamber

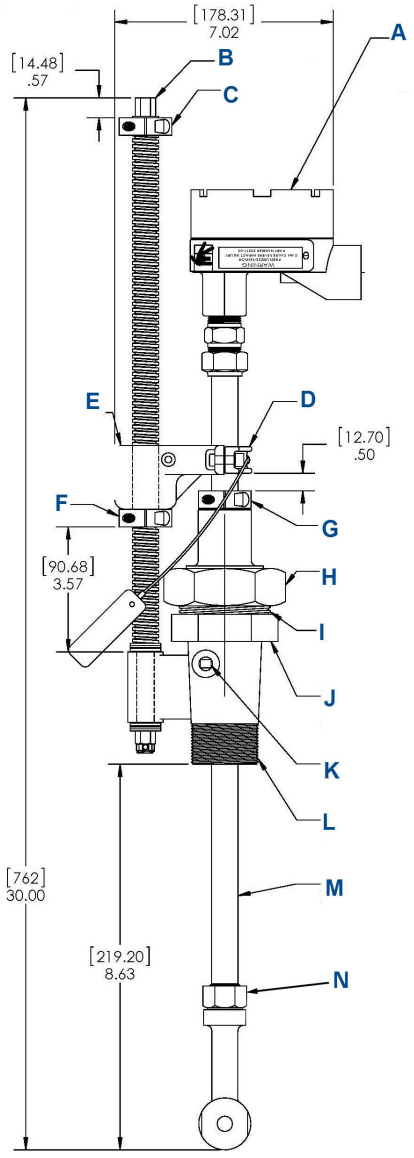
J. ⅛-in. MNPT plug

K. 1½-in. MNPT

L. 316 stainless steel ¾-in. O.D. tube

M. Manual retraction assembly

Figure 7: Mechanical Retraction Assembly PN 23311-00 Dimensional Drawing



A. Junction box with screw cap
B. Lead screw
C. Travel stop collar "B"
D. Cap
E. Nut housing
F. Travel stop collar "A"
G. Retraction stop collar
H. 3-in. hex union nut
I. 2.531-in. 8 ACME thread type
J. 2⅝-in. hex retraction chamber
K. ⅛-in. MNPT plug type
L. 1½-in. MNPT
M. Ø ¾-in. tube 316 stainless steel
N. Mechanical retraction assembly

Accessories

Table 5: Accessory list

Part number	Description
23550-00	Remote junction box without preamplifier
33081-00	Adapter insert, PEEK, 1 x ¾-in. for 23242-02
23294-00	Unshielded interconnecting cable for Rosemount 1054A, 1054B, and 2054C. Can also be used with Rosemount 1056, 56, 5081, and 1066-T, but not recommended. Prepped, specify length, per ft.
23294-05	Shielded interconnecting cable with additional shield wire for -03 option. For use with Rosemount 1056, 1066-T, 56, and 5081T. Prepped, specify length, per ft.
23311-00	Mechanical valve insertion assembly (Code 20)
23311-01	Manual valve insertion assembly (Code 20)
2001990	Sub assembly, adapter 2-in. bushing
9550179	O-ring, 2-135, EPR
23242-02	Mounting adapter, 1½-in. insertion, 1-in. x ¾-in.
23242-03	Mounting adapter, 1½-in. insertion (code 20), 1-in. conduit connection
23277-01	Mounting adapter, Foxboro, PEEK Code 20, ⅝-11 UNC
33075-00	Viton® gasket for option 20
33075-03	Kalrez® gasket for option 20
9200276	Extension cable, unprepped (specify length) per foot
9340065	Ball valve, full port 1½-in. Female National Pipe Thread (FNPT) (to 392 °F [120 °C])

Table 6: Spare Parts

Part number	Description
33080-01	Adapter insert, PEEK (Code 20) for 23242-03
33121-01	Sensor tube, 316 stainless steel, valve insertion
33131-00	Collette, brass (for PN 2311-00 only)
33168-00	Cap (for PN 23311-00 only)
33180-00	Bushing, PTFE® (for PN 23311-01 only)
33181-00	Bushing, PTFE (for PN 23311-00 only)
33182-00	Guard, PTFE
9555004	Cup seal, PTFE
9560279	Retaining ring for Rosemount 228 insertion assembly

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