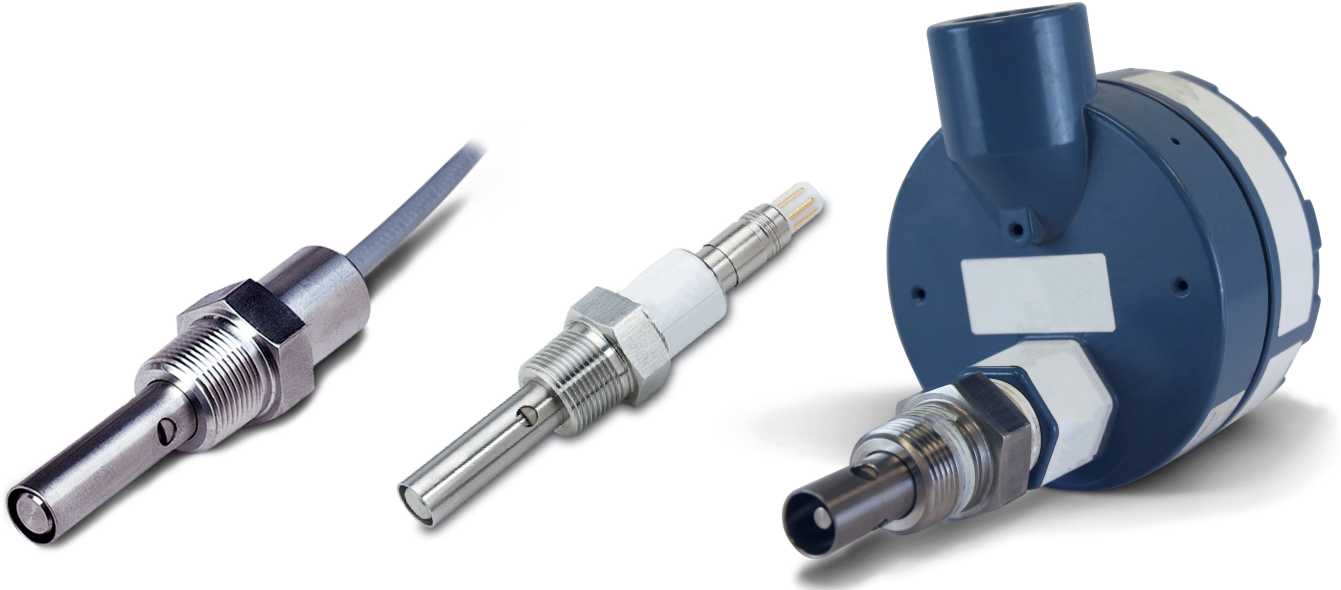


# Rosemount™ 400 and 400VP

## 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  $\mu\text{S}/\text{cm}$ .

# 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, 0.1, and 1.0/cm.



**Meet your process mounting needs.**

- The sensors are designed for direct screw-in insertion into process piping using a front facing 3/4-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.

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- 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](#)).

[CONFIGURE >](#)

[VIEW PRODUCT >](#)

## 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 <sup>(1)</sup> |

(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 <sup>(1)</sup> |

(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 $\mu$ S/cm, 32 oz. (0.95 L)   |
| 05010797875 | Conductivity standard, SS-6A, 200 $\mu$ S/cm, 1 gal. (3.78 L) |
| 05010782468 | Conductivity standard, SS-5, 1000 $\mu$ S/cm, 32 oz. (0.95 L) |
| 05010783002 | Conductivity standard SS-5A, 1000 $\mu$ S/cm, 1 gal. (3.78 L) |
| 05000705464 | Conductivity standard, SS-1, 1409 $\mu$ S/cm, 32 oz. (0.95 L) |
| 05000709672 | Conductivity standard, SS-1A 1409 $\mu$ S/cm, 1 gal. (3.78 L) |
| 05010782147 | Conductivity standard SS-7, 5000 $\mu$ S/cm, 32 oz. (0.95 L)  |

| Part number | Description                                                   |
|-------------|---------------------------------------------------------------|
| 05010782026 | Conductivity standard SS-7A, 5000 $\mu$ S/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) |
| Body                                                                                                                                                                                                            | 316 stainless steel                        |
| O-ring                                                                                                                                                                                                          | Viton®                                     |
| All wetted surfaces have 16 micro in. (0.4 micrometer) Ra finish.                                                                                                                                               |                                            |
| 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                                                                                                                                                                                                        |                                            |
| Vacuum                                                                                                                                                                                                          |                                            |
| At 1.6-in. Hg, air leakage is less than 0.005 SCFM                                                                                                                                                              |                                            |
| Cell constants                                                                                                                                                                                                  |                                            |
| 0.01, 0.1, and 1.0/cm                                                                                                                                                                                           |                                            |
| Process connection                                                                                                                                                                                              |                                            |
| ¾-in. male national pipe thread (MNPT)                                                                                                                                                                          |                                            |
| Cable length                                                                                                                                                                                                    |                                            |
| 10 ft. standard; for longer cable lengths, choose option -60 (integral junction box) and order interconnecting cable separately; interconnecting VP6 cables sold separately (see <a href="#">Accessories</a> ). |                                            |

Figure 1: Recommended Range - Contacting Conductivity

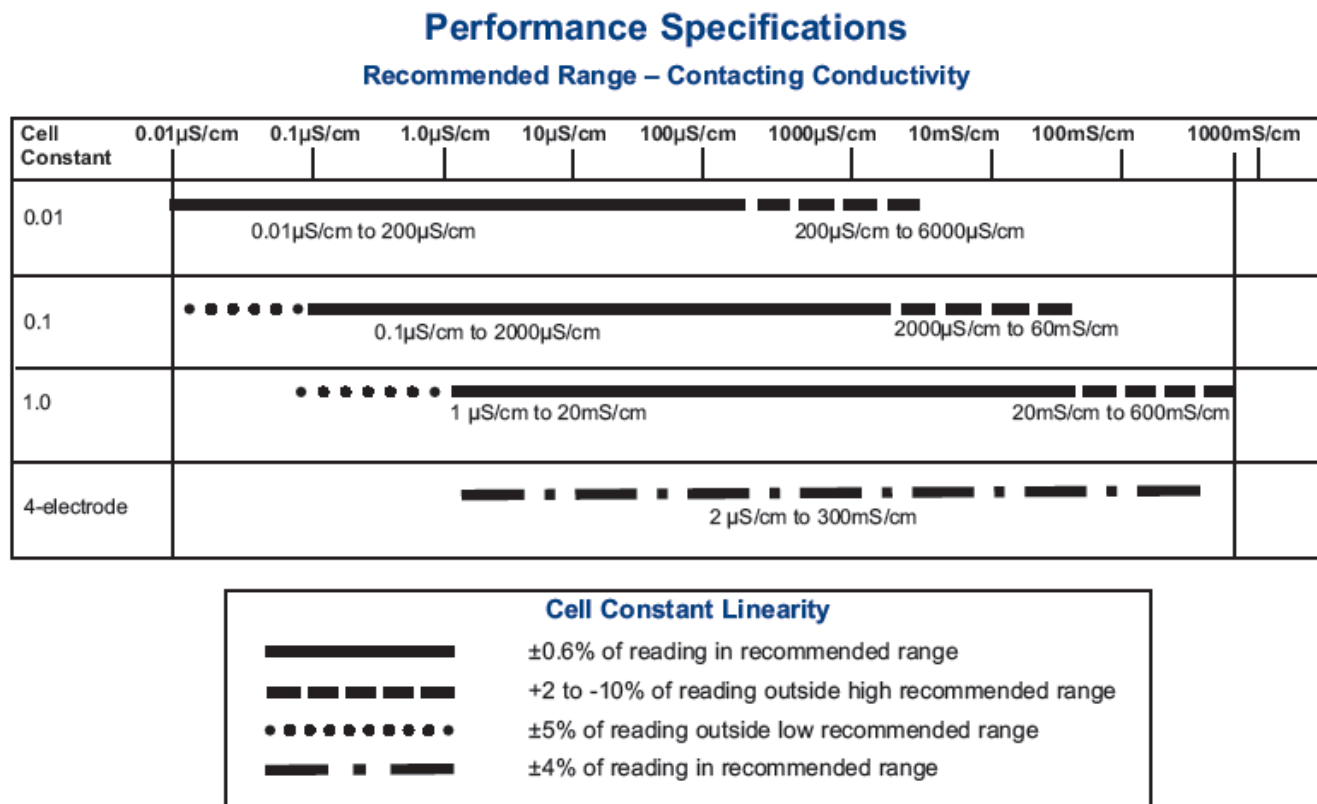


Table 1: Weights and Shipping Weights

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



**Table 2: Flow Cell (24092-02) Specifications**

| <b>Wetted materials</b>                  |                             |
|------------------------------------------|-----------------------------|
| Body and nut                             | Polycarbonate and polyester |
| ¼-in. fittings                           | 316 stainless steel         |
| O-ring                                   | Silicone                    |
| <b>Process connection</b>                |                             |
| Compression fittings for ¼-in. OD tubing |                             |
| <b>Temperature range</b>                 |                             |
| 32 to 158 °F (0 to 70 °C)                |                             |
| <b>Maximum pressure</b>                  |                             |
| 90 psig                                  |                             |

## Engineering specifications

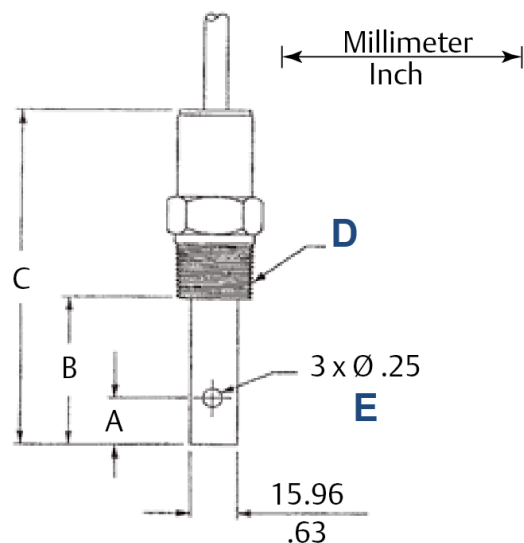
### Cell constants 0.01, 0.1, and 1.0/cm

- The sensor shall be suitable for the determination of electrolytic conductivity in clean, non-corrosive samples.
- The sensor shall have a ¾-in. 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.
- The sensor shall incorporate titanium electrodes and a polyether ether ketone (PEEK) insulator.
- The sensor shall have an integral platinum resistance temperature device (RTD) for temperature measurement.
- The sensor shall be available with either integral cable or a Variopol quick disconnect fitting.
- 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.
- The sensor shall be suitable for vacuum service as low as 1.6 in. Hg.
- The sensor shall be Rosemount 400 (integral cable) or 400VP (Variopol fitting) or approved equal.



## Dimensional drawings

**Figure 3: Rosemount 400 with Integral Cable Connection Dimensional Drawing**

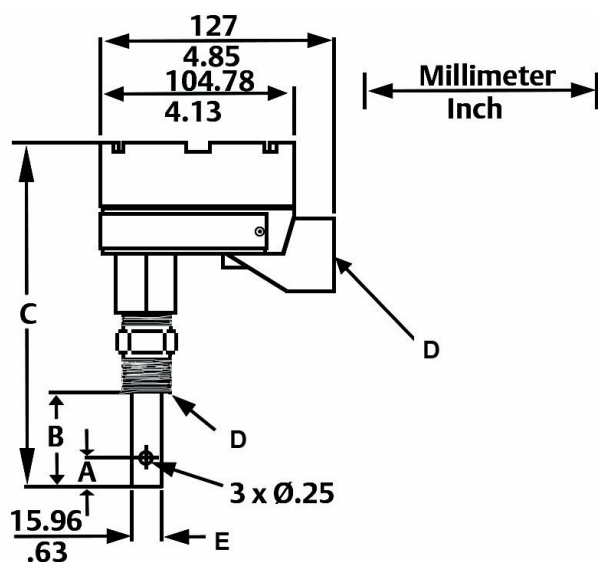


- A. Dimension (see [Table 3](#))
- B. Dimension (see [Table 3](#))
- C. Dimension (see [Table 3](#))
- D.  $\frac{3}{4}$ -in. -14 national pipe thread (NPT)
- E. Equally spaced

**Table 3: 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 4](#))

B. Dimension (see [Table 4](#))

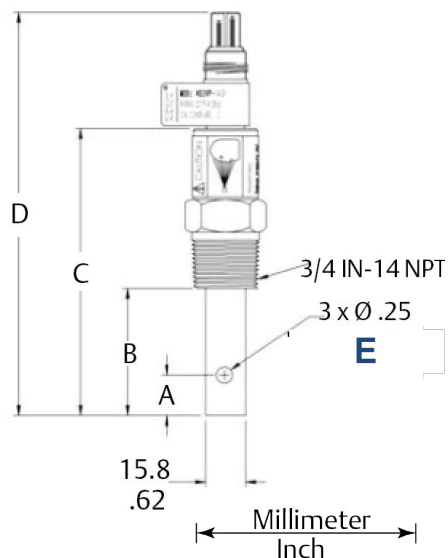
C. Dimension (see [Table 4](#))

D. 3/4-in.-14 NPT

E. Equally spaced

Table 4: 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 5](#))

B. Dimension (see [Table 5](#))

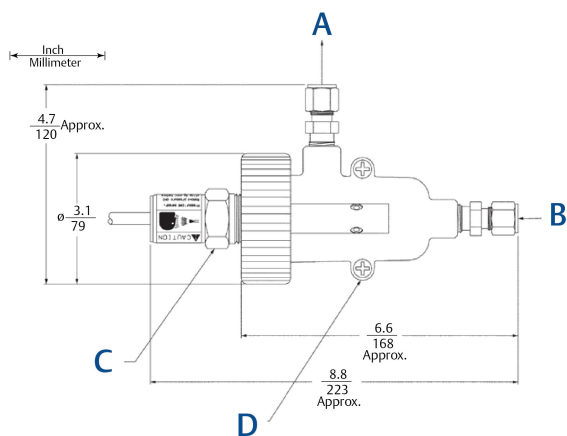
C. Dimension (see [Table 5](#))

D. Dimension (see [Table 5](#))

E. Equally spaced

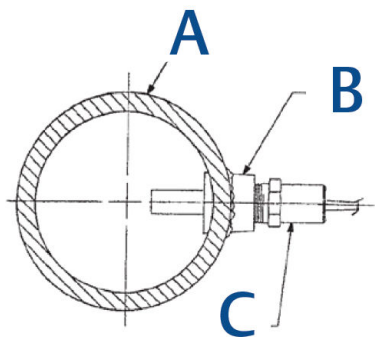
**Table 5: Rosemount 400VP with Variopol Cable Connection Dimensions**

| Sensor configuration                        | 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<br>(with extended insertion length) | 1.59 | 40.4  | 5.48 | 139.2 | 7.91 | 200.9 | 9.78 | 248.4 |
| 0.1/cm<br>(with extended insertion length)  | 0.67 | 17.0  | 5.48 | 139.2 | 7.91 | 200.9 | 9.78 | 248.4 |
| 1.0/cm<br>(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)**

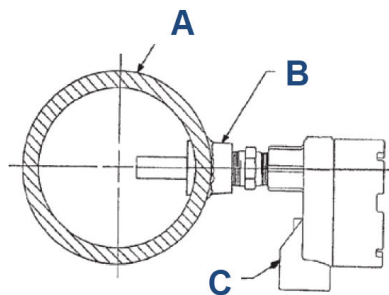
- A. Outlet
- B. Inlet
- C. Rosemount 400
- D. Low flow cell (PN 24091-02)

### Rosemount 400 with Integral Cable Connection

**Figure 7: Large Pipe or Tank Installation**

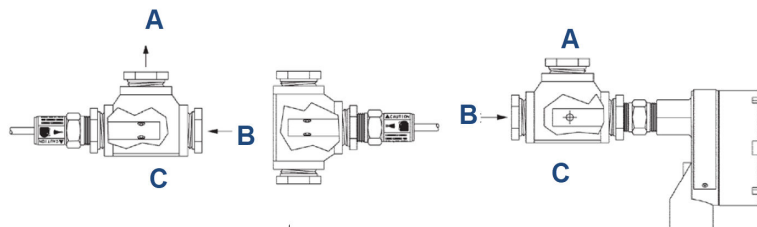
You can screw the Endurance™ sensor into a weldolet in either a pipe or large tank.

- 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.

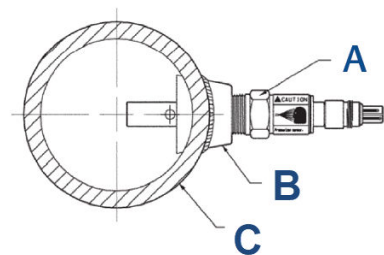
- A. Process piping
- B. Weldolet
- C. Sensor

**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.

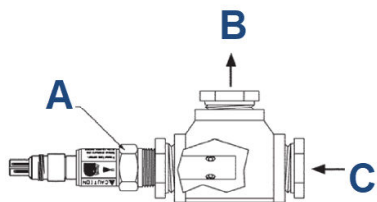
- A. Outlet
- B. Inlet
- C. 1-in. pipe tee with  $\frac{3}{4}$ -in. bushing shown

### 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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