Product Data Sheet
00813-0100-3403, Rev AC
January 2020

Rosemount™ 403/403VP

Contacting Conductivity Sensors

Reliably measure conductivity with PURSense™ sensors.

Rosemount 403 and 403VP contacting conductivity sensors are sanitary flange sensors commonly used in water purification systems in the food and beverage industry. These sensors are ideal for measuring electrolytic conductivity in Water-for-Injection (WFI).

Overview

Meet sanitary and hygienic requirements.

- Available with 1½-in. and 2-in. sanitary flange process connections.
- All wetted plastics and elastomers are compliant with 21CFR177.
- All wetted plastics and elastomers meet USP Class VI requirements.

High performance design.

- Available in 0.01, 0.1, and 1.0/cm cell constants.
- Internal platinum resistance temperature device (RTD) for temperature compensation.
- Steam sterilizable up to 275 °F (135 °C).
- Operates in pressures up to 250 pisg (17.2 BarG).
- Variopol (VP6) cable connection option, for quick cable-to-sensor release, eliminates cable twisting.

Minimize startup and installation time.

- A factory-measured cell constant ensures out-of-box accuracy and no initial calibration requirements.

Ordering information

The Rosemount 403 and 403VP contacting conductivity sensors are ideal for measuring electrolyte conductivity in clean water applications in the pharmaceutical and food and beverage industries. All wetted polymers are 21CFR177 (FDA) compliant and meet USP Class VI requirements. All wetted surfaces have a 16 micro inch (0.4 micrometer) Ra finish. A certificate of conformance is provided with each sensor. For a copy of supplier material traceability certificates, order option -MC. Interconnecting VP cables sold separately (for Rosemount 403VP).

Contents

Rosemount 403 Contacting Conductivity Sensor ordering information

Note

The Endurance™ Rosemount 403 sanitary flange conductivity sensors are supplied with 1½-in. or 2-in. stainless steel sanitary process connections. Rosemount 403 sensors have a maximum temperature rating of 221 °F (105 °C) and are suitable for sterilization up to 275 °F (135 °C). The standard Rosemount 403 sensor has a Pt-1000 resistance temperature device (RTD) and a 10-ft. (3 m) integral cable.

All wetted surfaces in the Rosemount 403 have 16 micro-inch (0.4 micrometer) Ra finish, and all elastomers and plastics in the Rosemount 403 are compliant with 21CFR177 and USP Class VI.

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Model

Code	Description
403	Contacting Conductivity Sensor

Cell constant

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

Flange size

Code	Description
20	1½-in. stainless steel sanitary fitting
21	2-in. stainless steel sanitary fitting

Temperature compensation

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

Electrode extension insertion length

Code	Description
_	No selection
36	Extended insertion length (6.0-in. [152.4 mm] from inside face of flange to end)

Cable length

Code	Description
_	No selection

Code	Description
50	Integral 50-ft. (15 m) cable
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)

Material traceability certificates - optional level

Code	Description
MC	Material Traceability Certificate

Rosemount 403VP Contacting Conductivity Sensor ordering information

Note
The standard Rosemount 403VP sensor has an integral six pin Variopol (VP6) connector. A mating VP6 connector cable is required for use with these sensors.

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Model

Code	Description
403VP	Conductivity sensor - sanitary flange Variopol connector

Cell constant

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

Flange size

Code	Description
20	1½-in. stainless steel sanitary fitting

Code	Description
21	2-in. stainless steel sanitary fitting

Temperature compensation

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

Electrode extension insertion length

Code	Description
_	No selection
36	Extended insertion length (6.0-in. [152.4 mm] from inside face of flange to end)

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)

Material traceability certificates - optional level

Code	Description
MC	Material Traceability Certificate

Specifications

Table 1: Rosemount 403/403VP Contacting Conductivity Sensor Specifications

Wetted materials	
Electrodes	Titanium
Insulator	PCTFE (neoflon), compliant to 21CFR 177.1380 and USP Class VI
Body	316 stainless steel
O-ring	EPDM, compliant to 21CFR 177.1380 and USP Class VI
Surface finish	
All wetted surfaces have 16 micro in. (0.4 micrometer) Ra finish.	
Temperature range	
32 to 221 °F (0 to 105 °C). Sensors are steam sterilizable to 275 °F (135 °C).	

Table 1: Rosemount 403/403VP Contacting Conductivity Sensor Specifications *(continued)*

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 m^3/min.)
Cell constants
0.01, 0.1, and 1.0/cm
Process connection
1½-in. or 2-in. sanitary flange
Cable length
10 ft. (3 m) standard; other lengths are optional.

Figure 1: Recommended Range - Contacting Conductivity

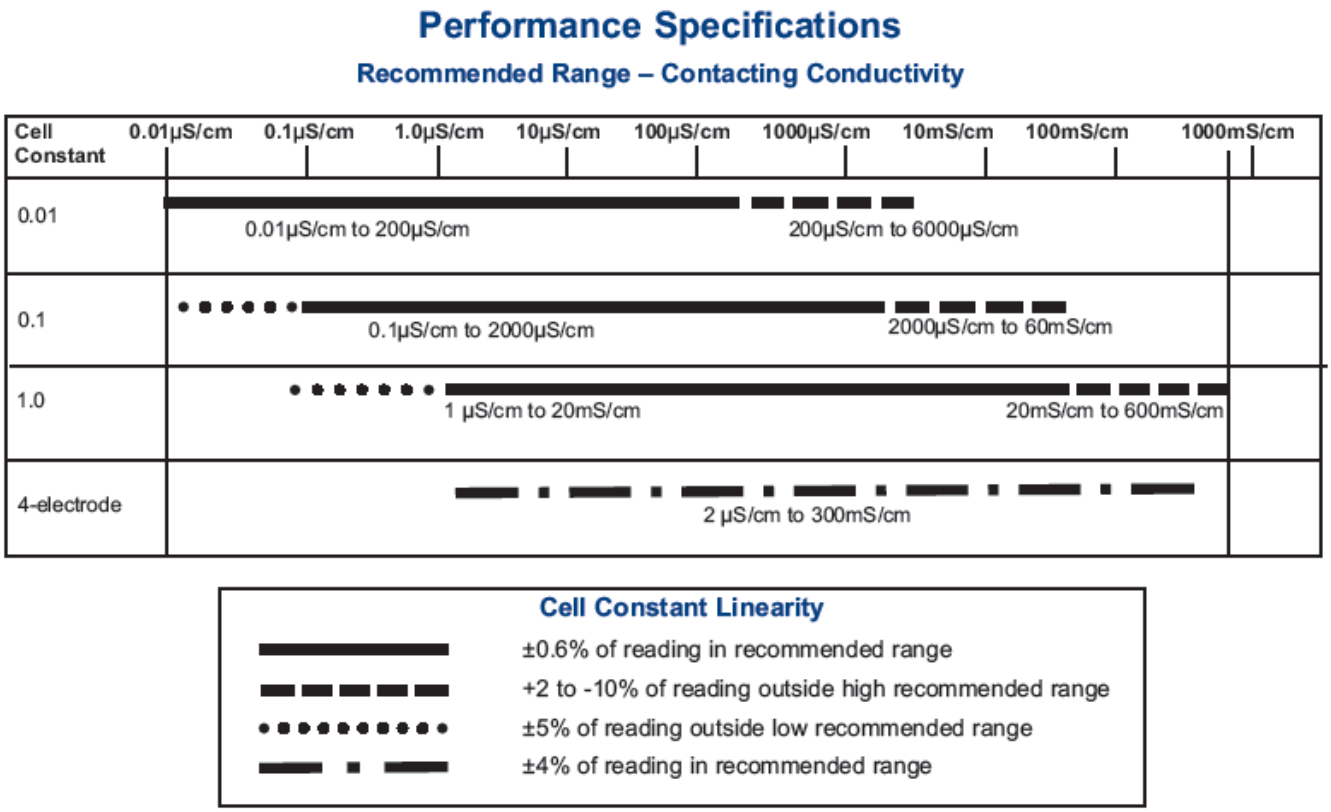


Table 2: Rosemount 403/403VP Weights and Shipping Weights

Rounded up to the nearest 1 lb. or 0,5 kg.

Sensor	Weight	Shipping weight
Rosemount 403 with 10-ft. (3.1 m) cable	2 lb. (1.0 kg)	3 lb. (1.5 kg)
Rosemount 403 with 50-ft. (15.2 m) integral cable	4 lb. (2.0 kg)	5 lb. (2.5 kg)

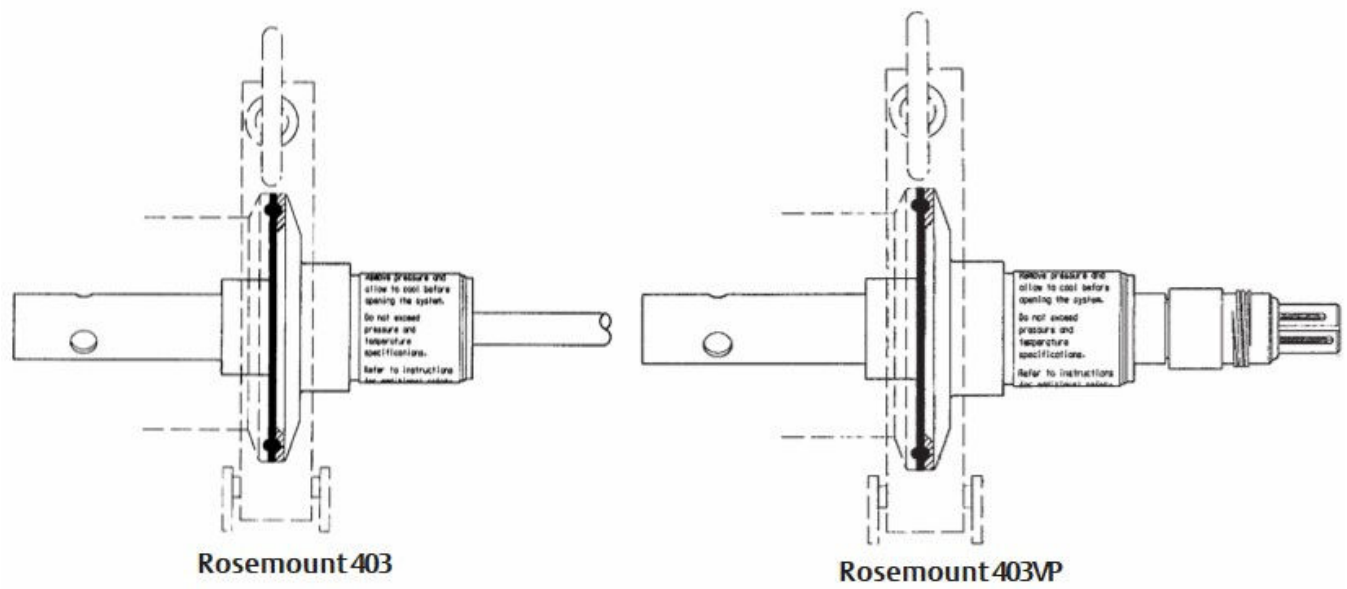
Table 2: Rosemount 403/403VP Weights and Shipping Weights *(continued)*

Sensor	Weight	Shipping weight
Rosemount 403VP with Variopol cable connection	1 lb. (0.5 kg)	2 lb. (1.0 kg)

Figure 2: Flow Cell

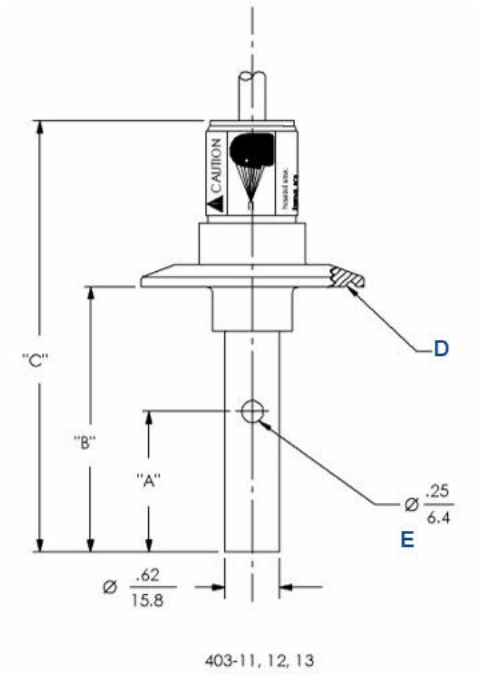
Installation drawings

Figure 3: Rosemount 403 and 403VP Sensor Installation



The customer supplies the Tri-Cover tee, clamp, and gasket. Install the sensor so that it is completely submerged in the process liquid. Installation in a vertical pipe run is best. If the sensor must be installed in a horizontal pipe run, place the sensor in the 3 o'clock position.

Figure 4: Rosemount 403 Sensor Dimensional Drawing



A. *Dimension (see Table 3)*
B. *Dimension (see Table 3)*
C. *Dimension (see Table 3)*
D. *O-ring groove*
E. *Three holes, equally spaced*

Table 3: Rosemount 403 Sensor Dimensions

Model number	A		B		C	
	in.	mm	in.	mm	in.	mm
403-11 standard length	1.59	40.4	3.00	76.2	4.88	124.0
403-12 standard length	0.67	17.0	1.62	41.1	3.50	88.9
403-13 standard length	0.67	17.0	2.13	54.1	4.01	101.9
403-11 extended length (-36)	1.59	40.4	6.00	152.4	7.88	200.2
403-12 extended length (-36)	0.67	17.0	6.00	152.4	7.88	200.2
403-13 extended length (-36)	0.67	17.0	6.00	152.4	7.88	200.2

Figure 5: Rosemount 403 Bottom View

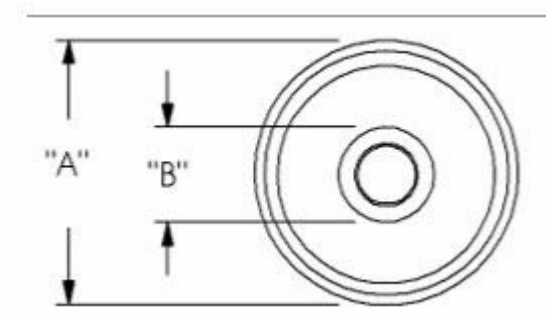
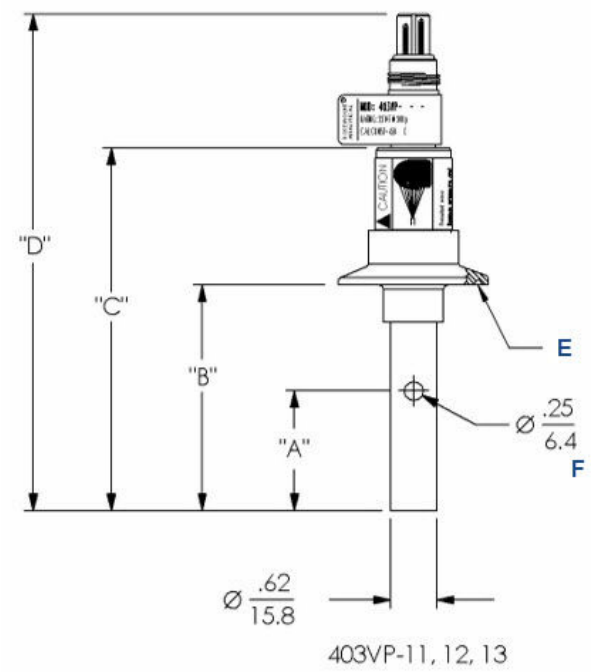


Table 4: Rosemount 403 Sensor Bottom View Dimensions

Model number	Fitting size	A diameter		B diameter	
		in.	mm	in.	mm
403-( )-20	1½-in.	1.98	50.3	.80	20.3
403-( )-21	2-in.	2.50	63.5	.90	22.9

Figure 6: Rosemount 403VP Sensor Dimensional Drawing



A. *Dimension (see Table 5)*
B. *Dimension (see Table 5)*
C. *Dimension (see Table 5)*
D. *Dimension (see Table 5)*
E. *O-ring groove*
F. *Three equally spaced*

Table 5: Rosemount 403VP Sensor Dimensions

Model number	A		B		C		D	
	in.	mm	in.	mm	in.	mm	in.	mm
403VP-11 standard length	1.59	40.4	3.00	76.2	4.80	121.9	6.60	167.6
Rosemount 403VP-12 standard length	0.67	17.0	1.62	41.1	3.44	87.4	5.24	133.1
Rosemount 403VP-13 standard length	0.67	17.0	2.13	54.1	3.95	100.3	5.75	146.1
Rosemount 403VP-11 extended length (-36)	1.59	40.4	6.00	152.4	7.80	198.1	9.60	243.8
Rosemount 403VP-12 extended length (-36)	0.67	17.0	6.00	152.4	7.80	198.1	9.60	243.8
Rosemount 403VP-13 extended length (-36)	0.67	17.0	6.00	152.4	7.80	198.1	9.60	243.8

Figure 7: Rosemount 403VP Bottom View

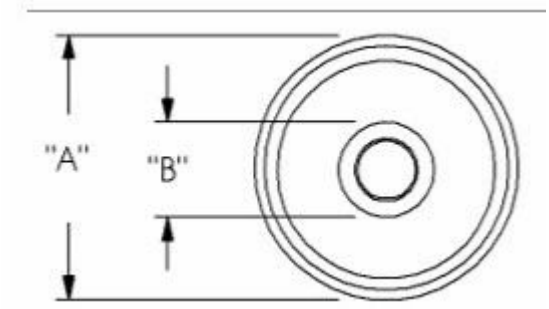


Table 6: Rosemount 403VP Sensor Bottom View Dimensions

Model number	Fitting size	A		B	
		in.	mm	in.	mm
Rosemount 403VP-( )-20	1½-in.	1.98	50.3	.80	20.3
Rosemount 403VP-( )-21	2-in.	2.50	63.5	.90	22.9

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
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)

Engineering specifications

Cell constants 0.01, 0.1, and 1.0/cm

- The sensor shall be suitable for the determination of electrolytic conductivity in water for injection and in any water purification installation where Tri Clamp fittings are used.
- The sensor shall be available with either 1½-in. or 2-in. 316 stainless steel sanitary flanges.
- Electrodes shall be titanium.
- The insulator shall be PCTFE and shall be compliant with 21CFR177.1380 and USP Class VI.
- The O-rings shall be EP and shall be compliant with 21CFR177.1380 and USP Class VI.
- All wetted surfaces shall have a 16 micro-inch (0,4 micrometer) Ra finish.
- 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 stainless steel body sensor shall be 212 °F (100 °C) at 100 psig (791 kPa [abs]).
- The sensor shall be suitable for vacuum service as low as 1.6 in. Hg (5.2 kPa).
- The sensor shall be Rosemount 403 (integral cable) or 403VP (Variopol fitting) or approved equal.

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