EMCO 4-electrode Sanitary Conductivity Sensors With External Electrodes series 623

APPLICATIONS

The EMCO conductivity sensor series 623 for sanitary applications is designed to monitor low conductivity process liquids.

INDUSTRIES

Pharmaceutical, dairy and other general food industries.

CONSTRUCTION

The 4-electrode sensor principle employs two current and two voltage electrodes. The two current electrodes apply an alternating voltage and induce a constant current loop. The two voltage electrodes measure a voltage drop depending on the conductivity of the fluid. The alternation eliminates the effect of polarization. 4 electrode sensors are therefore not sensitive to contamination and have a much wider measurement range. The electrodes are external for use in larger pipes. Series 613 is for smaller pipes.

The sensor element can be delivered in 2 sizes: One with short electrodes for higher conductivity ranges and one with long electrodes for lower conductivities.

Temperature compensation

The ionic activities increase highly with increasing temperature. In average the conductivity changes 2%/°C. Conductivity measurements are all referred to reference temperature of 25 °C. In industrial processes the temperature often changes therefore temperature compensation is necessary. The built-in temperature sensor is very accurate with a low response time.

Our many years in instrument design guarantees a rugged design, but still allows the possibility to solve customers’ special requirements.
PRINCIPLE OF MEASUREMENT

Electrical conductivity is the ability of a liquid to carry a current. The conductivity is equal to the conductance of the liquid times the cell constant. The conductance is the reciprocal of the electrical resistance of the liquid measured. The cell constant is equal to the distance between the electrodes divided by the effective area of the electrodes.

Cell constant
The cell constant is equal to the distance in cm between the electrodes divided by the effective area in cm² of the electrodes. The applicable value of the cell constant depends on the conductivity of the solution being measured. Low conductivity requires low cell constant and high conductivity requires high cell constant.

Factory determined cell constant ensures highest accuracy. The cell constant is marked on the sensor. The dedicated analyzer is programmed with this specific cell constant ensuring the highest accuracy.

FEATURES

Easy to install  I  Applicable for UPW applications  I  Rugged design  I  Wetted parts polished to Ra 0,8
I  Resistant to scaling  I  FDA compliant materials.

TECHNICAL SPECIFICATION

Measuring range : 0,05 μS/cm to 20 mS/cm with long electrodes
                 1 mS/cm to 200 mS/cm with short electrodes.

Material. electrodes : Stainless steel AISI 316, other materials on request.
Material. sensor body : Stainless steel AISI 316.
Material. Electrode holder : PTFE.
Process connection : 1½”, 2” or 2½” ISO 2852 flange for clamp connection.
Installation length : 70 mm, other lengths on request.
Pressure : Max 12 bar-g.
Temperature : Max 160°C.
Temperature element : Pt1000 Class A to IEC 751.
Cell constant : individually determined, value is marked on sensor body.
Uncertainty : 2 % per decade.
Protection class : IP 65.
Electrical connection : 9 pin connector or fixed cable.
CALIBRATION

The sensors can be calibrated in one or several points documented at reference temperature of 25°C.

DOCUMENTATION

Dimensional drawing.

Material certificate according to EN 10204-3.1.

Roughness measurement certificate.

Pressure test certificate.

Calibration certificate.

Instruction manual.

OVERALL DIMENSIONS

![Sensor Dimensions](image)

Shown sensor with short electrodes for high conductivity range. Dimensions in mm

ACCESSORIES

With our fully equipped machine shop including welding EMCO Controls can supply mechanical parts including flow tubes, by-pass systems etc.

QUALITY ASSURANCE

EMCO Controls is certified according to ISO 9001-2015, Pressure Equipment Directive PED Module H, and welding quality certificate to EN 3834-2.
### SENSOR CODING

1. **Type 623**

2. **Mounting**

   - 1½” ISO 2852. 25 - 38: code 4C
   - 2” ISO 2852. 40 - 51: code 5C
   - 2½” ISO 2852. 63,5: code 6C

3. **Electrode type**
   - external: code 2

4. **Electrode material**
   - Stainless steel 316: code 316
   - Other, please specify

5. **Sensor body**
   - 316/PTFE, short: code 3PS
   - 316/PTFE, long: code 3PL
   - Other, please specify

6. **Length, insertion**
   - 70 mm: code 007

7. **Cable connection**
   - connector: code C
   - fixed: code F

8. **Cable length**
   - 5 meter: code 05
   - 10 meter: code 10
   - 20 meter: code 20
   - 30 meter: code 30

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**Example**

Conductivity sensor with 2” ISO 2852, external electrodes in stainless steel 316, sensor body for short electrodes in AISI 316 and PTFE, installation length 66 mm, cable connector, and 5 meter cable has following code:

623-5C-2-316-3PS-006-05