EMCO 4-electrode Sanitary Conductivity Sensors
With Internal Electrodes Series 613

APPLICATIONS
The EMCO conductivity sensor series 613 for sanitary applications is designed to monitor high and low conductivity in 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 internal for use in smaller pipes and for lower conductivity ranges. Series 623 is for larger pipes and vessels.

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 roughed design, but still allows the possibility to solve customers' special requirements. A selection of electrode and sensors element materials is available to suit the specific application.
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 | Rugged design | Wide selection of materials and mounting options | Resistant to scaling.

TECHNICAL SPECIFICATION

Measuring range : 1 μS/cm to 200 mS/cm
Material. electrodes : Stainless steel AISI 316, other materials on request
Material. sensor body : Stainless steel AISI 316.
Material. Electrode holder : PVDF, PTFE, others on request
Installation length : 57 mm, other lengths on request
Pressure : Max 10 bar-g.
Temperature : Max 130°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
Pressure test certificate
Calibration certificate
Instruction manual

OVERALL DIMENSIONS

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 613

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
   Internal code 1

4. Electrode material

5. Stainless steel 316 code 316
   Other, please specify

6. Sensor body
   316/PVDF code 3V
   316/PTFE code 3P
   Other, please specify

7. Length, insertion
   57 mm code 005

8. Cable connection
   connector code C
   fixed code F

9. Cable length
   5 meter code 05
   10 meter code 10
   20 meter code 20
   30 meter code 30

Example

Conductivity sensor with 2” ISO 2852, internal electrodes in stainless steel 316, sensor body in AISI 316 and PVDF and installation length 57 mm, cable connector, 5 meter cable has following code:

613-5C-1-316-3V-005-C-05