Chloride Ion Sensors

Electro-Chemical Devices

Features	Benefits
• Model S80 Universal Style Sensors	• Insertion, Immersion or Valve Retractable Service
• Multiple materials of construction	• 316 Stainless Steel, Titanium, Hastelloy
• Integral Signal Conditioner	• Noise free transmission
• Replaceable Electrode Cartridge	• Simple and Economical Service
• Dual Channel Analyzers, pH/pION, pION/pION	• Mix and Match your choice of measurements

Model S80 Sensors
Chloride Ion Sensors

Description

The Model S80 universal sensors provide a stable and economical platform for the in line measurement of pH, ORP, Specific Ion, Dissolved Oxygen, Conductivity or Resistivity. The Model S80 is an insertion or immersion style sensor for use in pipe Tees or on the end of a Stand Pipe for immersion into a tank or pond. The Model S80 is also available as a valve retractable design allowing insertion or removal of the sensor into a pipe without interrupting the process flow. Both sensor designs use easily replaceable electrode cartridges. ECD offers several ion selective electrode cartridges suitable for continuous online measurement.

The Chloride Ion Electrode is a combination electrode with a silver Chloride/silver sulfide (AgCl/AgS) solid state pressed crystal sensing element and a double junction reference electrode. The Chloride Ion Selective Electrode cartridge develops a millivolt potential proportional to the concentration of chloride ions in the measured solution. The typical output is 54mV to 60 mV per decade of change in concentration. The speed of response varies from a few seconds in concentrated solutions up to a few minutes in the lower ppm ranges. The Chloride Ion sensors are used with the Model T80 Transmitter with its dual channel mix and match capabilities. These analyzers will measure chloride from 2.0 ppm to 35,500 ppm autoranging the display between the ppb, ppm and ppt (parts per thousand) scales.

All silver sulfide based solid state ion electrodes are sensitive to the silver and sulfide ions in solution in addition to the primary ion of interest. Both ions must be absent from the measured solution. Strong reducing solutions like photographic developer, thiosulfate, cyanide, ammonia, will attack the sensor depositing silver on the sensing crystal surface. Bromide, sulfide, iodide will form insoluble precipitates on the crystal surface diminishing the response. Polishing the sensor with the supplied polishing strips will restore the function.

The sensor is calibrated using two standard solutions differing in concentration by a factor of 10, i.e. 10 ppm and 100 ppm. The calibration sets the slope of the electrode, mV/decade, and the zero potential for the sensor.

In many cases the process solution's ionic strength, temperature and pH value will differ widely from the calibration solution. These factors will affect the zero potential of the chloride sensor causing an offset, but they will typically not affect the slope. To eliminate the offset perform a standardization, a single point in-line calibration. Once the sensor has stabilized in the process solution take a grab sample from the process and determine the chloride ion concentration. Adjust the analyzer to read this laboratory determined value. It is recommended to verify the readings on a weekly basis.

Specifications

Model S80 Chloride Sensors

Combination electrode cartridge with measurement cell, reference electrode, signal conditioner, ATC

Electrode Slope

54 ± 5 mV per decade of concentration change

Measurement Range

Chloride: 2.0 to 35,500 ppm (2-12 pH)

5.6 x 10^{-5} molar to 1.0 molar

Temperature Range

0° C to 80° C (32° F to 176° F)

Pressure Range

0 - 50 psig (0 - 3.5 barg)

Response Time

T90 in 10 seconds

Reproducibility ± 2%

Accuracy

± 2% (Calibrated with NIST Cal Solutions/Standards)

Electrode Life

6 to 12 months

Interfering ions

Bromide, iodide, strong reducing agents

Wetted Materials

Radel, epoxy, AgS/AgCl, PTFE, 316 SS, Viton O-Ring

Process Connections

S80 Insertion: ¾" MNPT compression fitting

S80 Valve Retractable: 1" MNPT Ball Valve

Model T80 Transmitter

General purpose, ½ DIN, NEMA 4X, 110/220 VAC, 24 VDC or 4-20 mA loop powered, CE Marking, single or dual channel, (1) or (2) 4-20 mA outputs, optional (3) Alarm Relays 250 VAC 3 amp, MODBUS RTU (standard) or HART 7, Auto ranging display, ppb → ppm → ppthousand

Part No.	Model and Product Description
S80-00-0002-0100-075	S80 Chloride, Cl^- insertion style sensor with ¾" 316 SS compression fitting, 316 SS body, ¾" Diameter. x 10" length, 10 ft cable
S80-00-0002-0300-075	S80 Chloride, Cl^- insertion style sensor with ¾" 316 SS compression fitting, 316 SS body, ¾" Diameter. x 10" length, 30 ft cable
S80-01-0131-0110-075	S80 Chloride, Cl^- Valve Retractable Style with 1" Ball Valve Assembly, 316 SS body, ¾" Diameter x 17" length, 10 ft cable
S80-01-0131-0310-075	S80 Chloride, Cl^- Valve Retractable Style with 1" Ball Valve Assembly, 316 SS body, ¾" Diameter x 17" length, 30 ft cable
T80-10-21-00-1	Model T80 Single Channel Transmitterr, 110/220 VAC, (1) 4-20 mA outputs, (3) Alarm Relays, UM
T80-11-21-20-1	Model T80 Dual Channel Transmitterr, 110/220 VAC, (2) 4-20 mA outputs, (3) Alarm Relays, UM

Part No.	Spare Parts and Accessories Description
2005008.VIT	Chloride Ion Electrode, Radel body, double junction Teflon Ref, 2 -35,000 ppm, 0°-80°C
2000250-1	Polishing Strip Kit, abrasive cleaning strips for Ion electrodes
2010460	Chloride Ion Calibration Solution, 10 ppm
2010454	Chloride Ion Calibration Solution, 100 ppm

Specifications subject to change without notice.

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CERTIFIED ISO9001 QUALITY SYSTEM