Sodium 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
Sodium 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 Sodium Ion Electrode is a combination electrode with a glass bulb sensing element and a double junction reference electrode. The Sodium Ion Selective Electrode cartridge develops a millivolt potential proportional to the concentration of sodium ions in the measured solution. The typical output is 50mV to 60mV per decade of change in concentration. The Sodium Ion sensors are used with the Model T80 Transmitter with its dual channel mix and match capabilities. These analyzers will measure sodium ions from 200 ppb to 100,000 ppm in the optimum pH range of 6-12 pH. In the acidic solutions the sodium ion electrode, Na^+, is interfered by the hydrogen ions, H^+, and in alkaline pH solutions, above pH 12, the cations present swamp out all but the highest levels of sodium ions. For measurements below 2 ppm sodium, the pH of the solution should be above pH 10, 20 ppm > 9 pH, 200 ppm > 8 pH....

Lithium ions, potassium ions and ammonium ions interfere with the sodium measurement. Lithium ions are the worst with 120 lithium ions generating the same signal as 1 sodium ion, potassium is around 1700:1 and ammonium is around 1,800:1. Other ions also interfere but to a much lower level, rubidium and thalliumare two examples but they are rarely present in the sample solutions. Silver ions react with the glass bulb forming complexes changing the base potential, silver should be absent.

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.

The process solution's ionic strength, temperature and pH value may differ widely from the calibration solution. These factors will affect the zero potential of the sodium sensor causing an offset, but they will typically not affect the slope. To eliminate the offset perform a standardization. Once the sensor has stabilized in the process solution take a grab sample from the process and determine the sodium 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 Sodium Sensors
Combination electrode cartridge with a Sodium sensitive glass bulb and a double junction, KCl-AgCl, reference electrode, signal conditioner, ATC

Electrode Slope
54 ± 5 mV per decade of concentration change

Measurement Range
Sodium: 200 ppb to 100,000 ppm
pH: 6 to 12 pH

Temperature Range
0° C to 80° C (32° F to 176° F)

Pressure Range
0 - 100 psig (0 - 3.5 barg)

Response Time
T90 in 10 seconds

Electrode Life
12+ months

Interfering ions
Lithium, 120:1, Potassium 1700:1, silver 0.04:1

Wetted Materials
Radel, epoxy, PVC, 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
S80-00-0002-0100-084	S80 Sodium, Na^+ insertion style sensor with ¾" 316 SS compression fitting, 316 SS body, ¾" Diameter. x 10" length, 10 ft cable
S80-00-0002-0300-084	S80 Sodium, Na^+ insertion style sensor with ¾" 316 SS compression fitting, 316 SS body, ¾" Diameter. x 10" length, 30 ft cable
S80-01-0131-0110-084	S80 Sodium, Na^+ Valve Retractable Style with 1" Ball Valve Assembly, 316 SS body, ¾" Diameter x 17" length, 10 ft cable
S80-01-0131-0310-084	S80 Sodium, Na^+ 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
2005031.VIT	Sodium Ion Electrode, Radel body, double junction Teflon Ref, 0.2 -100,000 ppm, 0°-80°C
2010484	Sodium Ion Calibration Solution, 10 ppm
2010485	Sodium Ion Calibration Solution, 100 ppm

Specifications subject to change without notice.

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