



Features

- Model S80 Universal Style Sensors
- Multiple materials of construction
- Integral Signal Conditioner
- Replaceable Electrode Cartridge
- Available with pH compensation

Benefits

- Insertion, Immersion or Valve Retractable Service
- 316 Stainless Steel, Titanium, Hastelloy
- Noise free transmission
- Simple and Economical Service
- Range, 12 pH to 14 pH with pH compensation



Model S80 Sensors
Sulfide 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 Sulfide Ion Selective Electrode cartridge develops a millivolt potential proportional to the concentration of free sulfide ions in the measured solution. The Sulfide Ion Sensors are used with the Model T80 Transmitter with its dual channel mix and match capabilities. These analyzers will measure free sulfide ions from 0.02 ppm to 32,000 ppm with the pH greater than pH 14. Without pH compensation a 10 % low error will occur at pH 13 and 50% low error will occur at pH 12.

Hydrogen Sulfide is a diprotic acid, it dissociates from H_2S to $\text{H}^+ + \text{HS}^-$ as the pH rises and then to $\text{H}^+ + \text{S}^{2-}$. Only the S^{2-} ion is measured by the sulfide ion sensor. The dissociation constants for the two hydrogen ions are $\text{pK}_{\text{a}1} = 7.04$ and $\text{pK}_{\text{a}2} = 11.9$. When the pH of a solution equals the pKa of an acid then half

of the acid is dissociated and half is not. For the sulfide ion the $\text{pK}_{\text{a}2} = 11.9$, so at 11.9 pH half of the total sulfide is the measurable S^{2-} ion and half is not. This characteristic can be compensated for by adding a pH sensor into the measurement loop. The T80 analyzer will report the total sulfide ion concentration by measuring the available free sulfide and adjusting the value in accordance with the measured pH value. The sensor is calibrated in two standard solutions differing in concentration by a factor of 10, i.e. 10 ppm and 100 ppm. This calibration sets the slope of the electrode, mV/decade and a zero potential for the sensor. In many cases the process solution's ionic strength and pH value differ widely from the calibration solutions characteristics. This difference will affect the zero potential of the sulfide sensor, causing an offset in the measurement but it will not affect the slope.

The offset is eliminated by conditioning the solution with sodium hydroxide to get the pH above pH 14 and performing a process standardization. When the sensor has stabilized in the conditioned process solution take a grab sample and determine the sulfide ion concentration and then adjust the analyzer to read this laboratory determined value. When using the pH compensated system, the solution only needs to be conditioned to above pH 11, this uses much less conditioning solution.

Sulfide Ion Sensors

Specifications

Model S80 Sulfide Sensors

Combination electrode cartridge with a Silver Sulfide measurement cell and a double junction reference electrode, KNO_3 : KCl/AgCl , signal conditioner, ATC

Electrode Slope

27 ± 2 mV per decade of concentration change

Measurement Range

Sulfide: 0.02 to 32,000 ppm, pH sensitive measurement, 11 pH to 14 pH with pH compensation, >13 pH without

Temperature Range

0° C to 80° C (32° F to 176° F)

Pressure Range

0 - 50 psig (0 - 3.5 bar)

Response Time

T90 in 10 seconds

Electrode Life

6 to 12 months

Interfering ions

None

Wetted Materials

PEEK, epoxy, AgS crystal, PTFE, 316 SS, Viton O-Ring

Process Connections

S80 Insertion: $\frac{3}{4}$ " MNPT compression fitting

S80 Valve Retractable: 1" MNPT Ball Valve

Model T80 Transmitter

General purpose, $\frac{1}{2}$ 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 $\rightarrow$ ppm $\rightarrow$ ppthousand

Part No.	Model and Product Description
S80-00-0002-0100-085	S80 Sulfide, S^{2-} insertion style sensor with $\frac{3}{4}$ " 316 SS compression fitting, 316 SS body, $\frac{3}{4}$ " Diameter. x 10" length, 10 ft cable
S80-00-0002-0300-085	S80 Sulfide, S^{2-} insertion style sensor with $\frac{3}{4}$ " 316 SS compression fitting, 316 SS body, $\frac{3}{4}$ " Diameter. x 10" length, 30 ft cable
S80-01-0131-0110-085	S80 Sulfide, S^{2-} Valve Retractable Style with 1" Ball Valve Assembly, 316 SS body, $\frac{3}{4}$ " Diameter x 17" length, 10 ft cable
S80-01-0131-0310-085	S80 Sulfide, S^{2-} Valve Retractable Style with 1" Ball Valve Assembly, 316 SS body, $\frac{3}{4}$ " Diameter x 17" length, 30 ft cable
T80-10-21-00-1	Model T80 Single Channel Transmitter, 110/220 VAC, (1) 4-20 mA outputs, (3) Alarm Relays, UM
T80-11-21-20-1	Model T80 Dual Channel Transmitter, 110/220 VAC, (2) 4-20 mA outputs, (3) Alarm Relays, UM

Part No.	Spare Parts and Accessories Description
2005122.VIT	Sulfide Ion Electrode, PEEK body, double junction reference, 0.02-32,000 ppm, 0°-80°C
2010414	Sulfide Ion Calibration Solution, 25% SAOB, 1.0 ppm (Hazardous Shipping Charge)
2010415	Sulfide Ion Calibration Solution, 25% SAOB, 10.0 ppm (Hazardous Shipping Charge)
2010437	Sulfide Ion Calibration Solution, 25% SAOB, 100 ppm (Hazardous Shipping Charge)
2000250-1	Polishing Strip Kit, abrasive cleaning strips for Ion electrodes
S80-00-0002-0100-007	S80 pH, insertion style sensor with $\frac{3}{4}$ " 316 SS compression fitting, 316 SS body, $\frac{3}{4}$ " Diameter. x 10" length, 10 ft cable with Sulfide Resistant pH electrode (for pH compensated measurement)
2005130.VIT	Sulfide resistant Electrode cartridge, PEEK body, double junction reference, 0°-80°C

Specifications subject to change without notice.

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