The Easy, Reliable Way To Monitor Dissolved Sulfides

Model A15/81

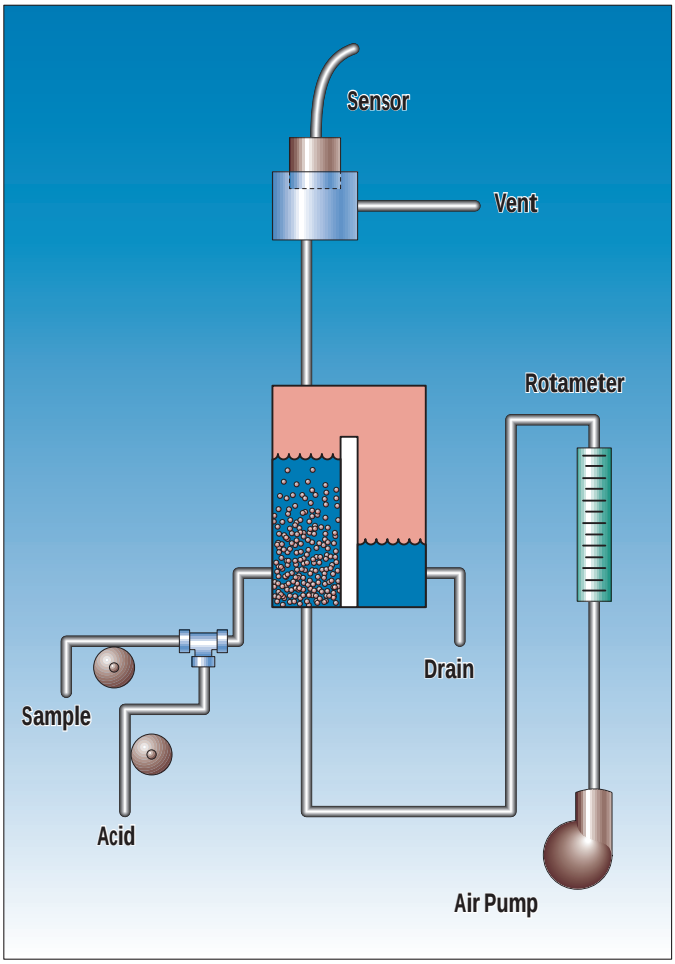
Dissolved Sulfide Monitor

Control H_2S Problems At Their Source

Sulfides can be found naturally in well water and can build up in wastewater collection systems due to anaerobic conditions that frequently occur. They are also used in mercury removal processes and are frequently found in tanning wastes. In drinking water systems, sulfides cause taste and odor problems. In wastewater systems, they can cause damage to concrete structures in collection systems and contribute to odor problems in treatment facilities.

Measurement of dissolved sulfide concentrations has been done primarily by the use of analyzers employing selective ion electrodes (SIE) for sensing. While providing adequate sensitivity, SIE based systems require frequent zero and span adjustments to maintain measurement accuracy. Because of this, most SIE based monitoring systems are relatively expensive and require frequent service.

ATI's Model A15/81 Dissolved Sulfide Monitor provides an improved method for measuring sulfides in solution. Rather than using an SIE sensor, the A15/81 employs a polarographic H_2S gas sensor that is isolated from the sample. The result is a system that can operate continuously on many types of water and wastewater streams with minimal maintenance and adjustment.



Operation

The A15/81Monitor takes a unique approach to the measurement of sulfide in solution. In operation, a small amount of sample is pumped into the system and mixed with acid. In acidic solution, hydrosulfide and sulfide ions (HS^- and S^{-2}) are converted to hydrogen sulfide according the following reactions:

$$HS^- + H^+ \rightarrow H_2S \quad \text{or}$$
$$S^{-2} + 2\,H^+ \rightarrow H_2S$$

The mixed sample flows into a special chamber where the hydrogen sulfide is stripped from the sample. A sensor located in the gas stream measures the released H_2S concentration and displays the results in terms of equivalent sulfide ion concentration in mg/l.

Because sulfide measurements are often made in samples of poor quality, fouling of the analytical system has been a major concern. An important feature of the A15/81 system is the fact that the sensor never comes in contact with the sample. Only the gas stream containing the stripped H_2S reaches the sensor. The result is a system that will continue to function, regardless of the quality of the sample. The only requirement is that large particulate be strained from the sample. The analytical system will easily pass particulate as large as 100 microns, so only course screening is required.

A15/81 Sulfide Monitors consist of three separate components, a chemistry module where the sample is pH adjusted for measurement, an inlet overflow assembly where raw sample is delivered to the system, and an electronic readout containing the sulfide concentration display, analog output, and alarm contacts. Readout modules are available in either wall mount NEMA 4X or general purpose panel mount versions. A 20 foot interconnecting cable is supplied to connect the monitor to the chemistry module, and separation can be increased to a maximum of 100 feet if required. An optional stainless steel system panel is available for mounting all components and providing a convenient shelf for reagent bottles.

Sample is connected to the overflow assembly using 1/4" I.D. flexible tubing. Recommended sample flow rate is 3-30 gallons per hour (0.2-2 LPM). While the monitor uses only a small fraction of this sample, higher flow keeps sample delivery times to a minimum. Excess sample simply overflows into a drain chamber. A 1/2" I.D. hose barb is provided for connection of drain tubing.

Sulfide monitoring systems are easy to operate and maintain. Acid usage for pH adjustment in the chemistry module is inexpensive and consumption is limited to one gallon every 40 days. Peristaltic pumps used for sample and acid use long-life tubing that requires replacement every 6 months. Pump heads are designed for easy tube changes, requiring about 10 minutes to replace both tubes. The sulfide gas sensor requires no maintenance other than an occasional visual inspection to ensure that no deposits have collected on the sensing membrane.

Monitoring sulfides in solution using the gas stripping techinque provides extremely high measurement sensitivity. Monitoring samples down to low parts-per-billion levels can be done easily. Because the gas sensor is very stable, monthly zero and span checks are all that's needed. A separate port is provided to feed distilled water or sulfide standards when required, without disrupting normal sample inlet flow.

Chemistry Module

NEMA 4X Monitor

Features

Sulfide Measurement: Sulfide ion is measured selectively by conversion to hydrogen sulfide.

Gas Phase Sensing: Measurement is made without contact between sample and sensor, eliminating the potential for sensor fouling.

Alphanumeric LCD: Provides sulfide display, alarm status indication, and all configuration information.

Two Control Relays: Relays are programmable for setpoint, deadband, and time delay. Relays offer pulse frequency and pulse width modulation control modes in addition to simple on/off control for direct chemical feed pump modulation.

Isolated Output: Programmable 4-20 mA output span from 0-0.2 PPM to 0-20.00 PPM full scale. Output may also be inverted if required.

High Sensitivity: Capable of measuring down to 5 PPB.

Model A15/81 Dissolved Sulfide Monitor Specifications

Electronic Monitor

Range:	0-2.000 or 0-20.00 PPM
Accuracy:	± 0.03 PPM
Repeatability:	± 0.01 PPM
Linearity:	0.1% of F.S.
Zero Drift:	< 0.01 PPM per month
Display:	16 character alphanumeric backlit LCD
Control Relay:	DPDT relay, 5A @ 220 VAC resistive. Programmable deadband and time delay.
Control Mode:	On/Off, pulse width modulation, pulse frequency modulation
Purge Control Relays:	Two SPST relays provided for automated sample purge cycle.
Analog Output:	Isolated 4-20 mA, 600 ohm maximum load. Programmable output span. Output may be inverted.
Operating Conditions:	0-50° C., 0-95% R.H. non-condensing.
Power:	110/220 VAC ±10%, 50/60 Hz.
Enclosure:	Panel mount standard, NEMA 4X (IP-65) wall mount optional.

Chemistry Module

Sensor:	Membraned H_2S Gas Sensor
Sensor Cable:	25 feet standard, 100 feet maximum
Response Time:	95% in 3 minutes
Sample Pump:	Internal Tubing Pump, 5 cc./min.
Acid Pump:	Internal Tubing Pump, 0.06 cc/min.
Air Supply:	Diaphragm air pump with precision flow control
Air Stripping Chamber:	Cast acrylic
Temperature Limits:	0-50° C.
Sample Flow Rate:	3-30 GPH (.2-2 LPM) at inlet over flow assembly.
Sample Inlet:	1/4" I.D. Hose Barb
Sample Drain:	1/4" I.D. Hose Barb
Power:	120 VAC, 60 Hz. standard, 220 VAC, 50 Hz. optional

Ordering Information:
Model A15/81 - C - D Monitor

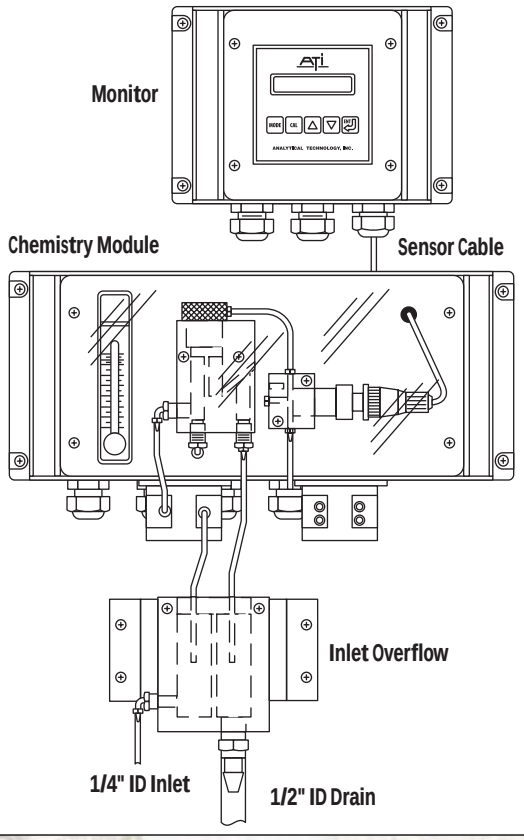
Suffix C - Enclosure
- 1 - Panel Mount
- 2 - NEMA 4X Wall Mount

Suffix D - Power
- 1 - 120 VAC, 60 Hz.
- 2 - 220 VAC, 50 Hz.

Options:

00-1261	Stainless steel system mounting plate
31-0037	Sensor interconnect cable (max. 100 ft.)

Typical Installation



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