

Water Quality Monitor

Q46/86 Thiosulfate Monitor

OVERVIEW

The Model Q46/86 is an online monitoring system designed for the continuous measurement of thiosulfate ($S_2O_3^{2-}$) concentration in water. The full-scale operating range of the system is user-selectable for 0...2000 ppm, 0...20.00 ppm or 0...200.0 ppm and the sensing system operates on water streams with temperatures in the range of 0...50° C.

Unique in its capability, this sensor is the only device designed to continuously monitor residual thiosulfate in flow environments. It delivers precise measurement across industries—from water treatment and refineries to textiles and agriculture—detecting excess thiosulfate linked to corrosion, optimizing bleaching processes, and supporting fertilizer formulation for operational efficiency, equipment protection and product quality.

The basic sensing element used in the monitor is a polarographic membraned sensor that measures thiosulfate directly. Water simply flows past the sensor and directly to drain, with the flow rate and pressure across the sensor controlled by a constant head flow cell assembly. The sensor measurement does not alter the sample or add any chemicals to the sample stream, so the water flow can return to the system if desired.

Q46H/86 Monitors are available in two basic electronic versions, a 90...260V AC powered monitor or a 12...24V DC powered monitor—both with three relays and two 4...20 mA analog outputs. Both versions allow flexible output options which include additional 4...20 mA current outputs, additional 0...30V DC signal relays, PID control and digital communication cards.

FEATURES

- **AC or DC Power Options.** Available in 90...260V AC or 12...24V DC power supply systems.
- **High Accuracy.** High sensitivity system measures from 0.1 ppm to 200.0 ppm through 4 internal automatic ranges
- **Multiple Functions.** Output Hold, Output Simulate, Output Alarm and Output Delay Functions.
- **Fully Isolated Inputs and Outputs.** Three 6-Amp SPDT relay outputs and two analog 4...20 mA outputs are standard. Two analog outputs on the AC-powered version may be configured to track $S_2O_3^{2-}$ and temperature or both outputs can be set to correspond to $S_2O_3^{2-}$ concentration.
- **PID Output.** Selectable PID controller on main analog output.
- **Digital Communications.** Five digital communication protocols are available: Profibus-DP, Modbus RTU, Modbus TCP/IP, Ethernet IP or Datalogger.



- **Clear Messaging.** Diagnostic messages provide a clear description of any problem with no confusing error codes to look up
- **Easy Calibration.** Quick and easy one-point calibration method and sensor zero-cal
- **Secure.** Security lock feature to prevent unauthorized tampering with transmitter settings

APPLICATIONS

The Q46/86 Monitor is engineered for applications in which $S_2O_3^{2-}$ is applied to water for sterilization purposes.

MOUNTING OPTIONS

- **Wall or Pipe Mount.** A PVC mounting bracket with attachment screws is supplied with each transmitter.
- **Panel Mount.** Optional panel mounting of an AC-powered monitor uses the panel mounting flange molded into the rear section of the enclosure.

Q46 PERFORMANCE SPECIFICATIONS

Accuracy	0.5% of selected range or 0.02 PPM
Repeatability	0.3% of selected range or 0.01 PPM
Sensitivity	0.05% of selected range
Nonlinearity	0.1% of selected range
Warm-up Time	3 seconds to rated performance (electronics only)
Supply Voltage Effects	± 0.05% span
Instrument Response Time	60 seconds to 90% of step input at lowest damping

SYSTEM SPECIFICATIONS

Displayed Parameters	Main input: 0.001...200.0 ppm Sensor temperature: -10.0...55.0° C (23...131° F) Sensor current: 0.0...999.9 nA, 0.000...99.99 uA Loop current: 4.00...20.00 mA Sensor slope/offset Model number and software version PID controller status
Main Parameter Ranges	Manual selection of one of the following ranges: 0.0...2.000 ppm 0.00...20.00 ppm 0.00...200.0 ppm
Display	0.75 in. (19.1 mm) high 4-digit main display with sign 12-digit secondary display, 0.3 in. (7.6 mm) 5 × 7 dot matrix Integral LED back-light for visibility in the dark
System Weight	Approximately 5 lb (2.3 Kg) with sensor and flow cell
Ambient Temperature	Analyzer service: -20...60° C (-4...140° F) Sensor service: -5...55° C (23...131° F) Storage: -5...70° C (23...158° F)
Ambient Humidity	0...95%, non-condensing.
EMI/RFI Influence	Designed to EN 61326-1
Output Isolation	600 V galvanic isolation
Filter	Adjustable 0...9.9 minutes damping to 90% step input
Temperature Input	Pt100 RTD with automatic compensation
Sensor	3-electrode polarographic membraned sensor for direct measurement of $S_2O_3^{2-}$
Sensor Materials	PVC and PEEK
Electrical Certification	Ordinary Location: cCSAus (CSA and UL standards, both CSA approved); pollution degree 2; installation category
Sensor Cable	25 ft (7.5 meter) cable with 6-pin plug.
Max. Sensor-to-Analyzer Distance	100 feet (30.5 meters), with junction box
Flow Cell	Constant head overflow, clear cast acrylic, 7...30 GPH, 15 GPH recommended, inlet is 1/4 in. hose barb at 1/8 in. MNPT, outlet is 1/2 in. hose barb at 3/8 in. MNPT
Power	90...260V AC, 50...60 Hz, 10 VA max or 12...24V DC, 500 mA max.
Enclosure	NEMA 4X, polycarbonate, stainless steel hardware, weatherproof and corrosion resistant
Mounting Options	Wall or pipe mount bracket standard; bracket suitable for either 1.5 in. or 2 in. I.D. U-Bolts for pipe mounting; Panel mount adapter optional
Conduit Openings	Five 1/2 in. NPT openings; adapter can be removed to provide a 1 in. NPT opening in the bottom of the enclosure; gland seals provided but not installed
Relays, Electromechanical	Three SPDT, 6 Amp @ 250V AC, 5 Amp @ 24V DC contacts. Software selection for setpoint, phase, delay, deadband, hi-lo alarm and failsafe. A-B indicators on main LCD; C indicator on lower display
Optional Relays	Three additional non-isolated low power relays available. SPST, 1 Amp @ 30V DC
Analog Outputs	Two 4...20 mA outputs: Output one programmable for PPM thiosulfate or PID; Output 2 programmable for PPM thiosulfate or temperature; Max. load 500 Ohms for each output; Outputs ground isolated and isolated from each other; An additional third analog option is available

ORDERING INFORMATION

QZ-A-B-C-D-E-F Thiosulfate Monitor

Suffix A - Power	
1	100...240V AC, $\pm 10\%$, 50/60 Hz
2	12...24V DC (requires 500 mA)
Suffix B - Sensor Type	
1A	Sensor with constant-head flow cell and 25 ft cable
2A	Submersible sensor with 25 ft cable
WW	None
Suffix C - pH Sensor Input	
1	None
2	Q22P pH sensor, battery preamp, 25 ft cable
3	Standard pH sensor, 25 ft cable, adapter
4	Standard pH sensor, 25 ft cable, sealed flow cell
Suffix D - Digital Output	
1	None
2	Profibus DP
3	Modbus RTU
4	Ethernet/IP
5	Modbus TCP/IP
6	Datalogger
Suffix E - Optional Output	
A	None
B	One additional 4...20 mA output
C	Three additional low power relays (SPST, 0.5 A max.)
Suffix F - System Assembly	
1	None
2	Panel with flow controls

NOTES: All systems are supplied with one package of 10 membranes, one 120 cc bottle of electrolyte, one spare parts kit containing 3 each of all O-rings and special screws.

Pipe mount requires two 2 in. U-bolts (part 47-0005).

OPTIONS

Part Number	Description
07-0100	Universal junction box, NEMA 4X
31-0038	7-c sensor interconnect cable, maximum 100 feet (Cl ₂ /pH systems)
05-0094	Panel mount bracket kit
47-0005	2 in. U-bolt, 304SS
55-0057	Fixed flow regulator, 400 cc/min., 1/4 in. inlet and outlet
03-0371	Fixed flow regulator assembly, 400 cc/min., 1/4 in. inlet and outlet, Viton
55-0071	Replacement filter screen
54-0053	Stainless steel tag (requires information for engraving)

