

Water Quality Monitor

Q46H/64 Dissolved Ozone

OVERVIEW

Water treatment processes using ozone gas have steadily increased over the past 20 years. Ozone has proven to be an extremely effective oxidant, removing organic carbon from raw water and destroying most pathogens. As a result, ozone treatment is now widely used in the semi-conductor, pharmaceutical, and food and beverage industries. In addition, many large cities are now using ozone to improve the quality of the drinking water distributed to their customers.

The Q46H/64 Dissolved Ozone Monitor provides an economical and reliable measurement system for monitoring and controlling ozone treatment systems. With a variety of outputs including 4...20 mA analog, PID control, three adjustable relays and digital communications, the Q46H/64 monitor is adaptable to any ozone application.

FEATURES

- **Flexibility.** Programmable range options from 0...200 ppb to 0...200 ppm provide maximum application flexibility.
- **AC or DC Power Options.** Power options include universal 100...240V AC or 12...24V DC.
- **PID Output.** Standard PID control function assignable to one analog output.
- **Digital Communications.** Available in Profibus DP, Modbus RTU, Modbus TCP/IP, Ethernet/IP or Datalogger.
- **Analog Output Options.** Two isolated 4...20 mA outputs are standard with an option for a third output, if required. Default setting provides analog outputs for ozone and temperature.
- **pH Input Option.** Enables the monitor to measure both dissolved ozone and pH. One analog output may be assigned to the pH measurement, allowing remote monitoring and recording of both variables.
- **Flexible Mounting.** NEMA 4X (IP66) enclosure is suitable for wall, pipe or panel mounting.
- **Large LCD Display.** Backlit large LCD display provides clear visibility in any lighting conditions. A scrolling second line on the display provides additional information and programming prompts.
- **Relay Outputs.** Three SPDT relays are standard, with relay functions programmable for alarm, control or trouble indication. Three additional low power relays available as an option.



APPLICATIONS

- Food & Beverage
- Cooling Water
- Aquarium
- Semi-Conductor Water Treatment
- Potable Water Treatment
- Pharmaceutical Manufacturing

INTERFERENCE-FREE OZONE MEASUREMENT

Q46H/64 monitors use a polarographic membraned sensor to accurately measure ozone in water. The sensor operates much like a battery, generating current that is linearly proportional to the concentration of ozone in solution. An ozone-permeable membrane isolates the sensor from the measured sample and insures that the measurement is interference free.

Two versions of the sensor are available: a sensor intended for installation in a flow cell and a sensor intended for submersion applications. The sensors require minimal maintenance and are easy to use and maintain. An integral RTD provides temperature compensation and allows temperature to be displayed and transmitted from the monitor.



Figure 1: Submersion and flow cell sensors

SENSOR STABILIZATION

Ozone sensors require 2...4 hours of stabilization time when first installed or after membrane change. Badger Meter offers a battery powered "polarizer" that can be used to stabilize a spare sensor so it is ready to run within a few minutes of installation. Polarizers simply plug into the sensor connector and require no adjustments.



Figure 2: Sensor polarizer

FLOW OPTIONS

Dissolved ozone sensors require a steady flow of sample across the membrane at the tip of the sensing assembly. Badger Meter offers a number of options for flow cells, including the standard constant-head overflow system, a sealed flow cell for pressures up to 50 psi, and a low-volume flow cell where low sample flow is important. A 1-1/2 inch flow tee is also available for in-line applications with reliable constant flow and pressure conditions. For simplicity of installation, complete flow control assemblies are available.

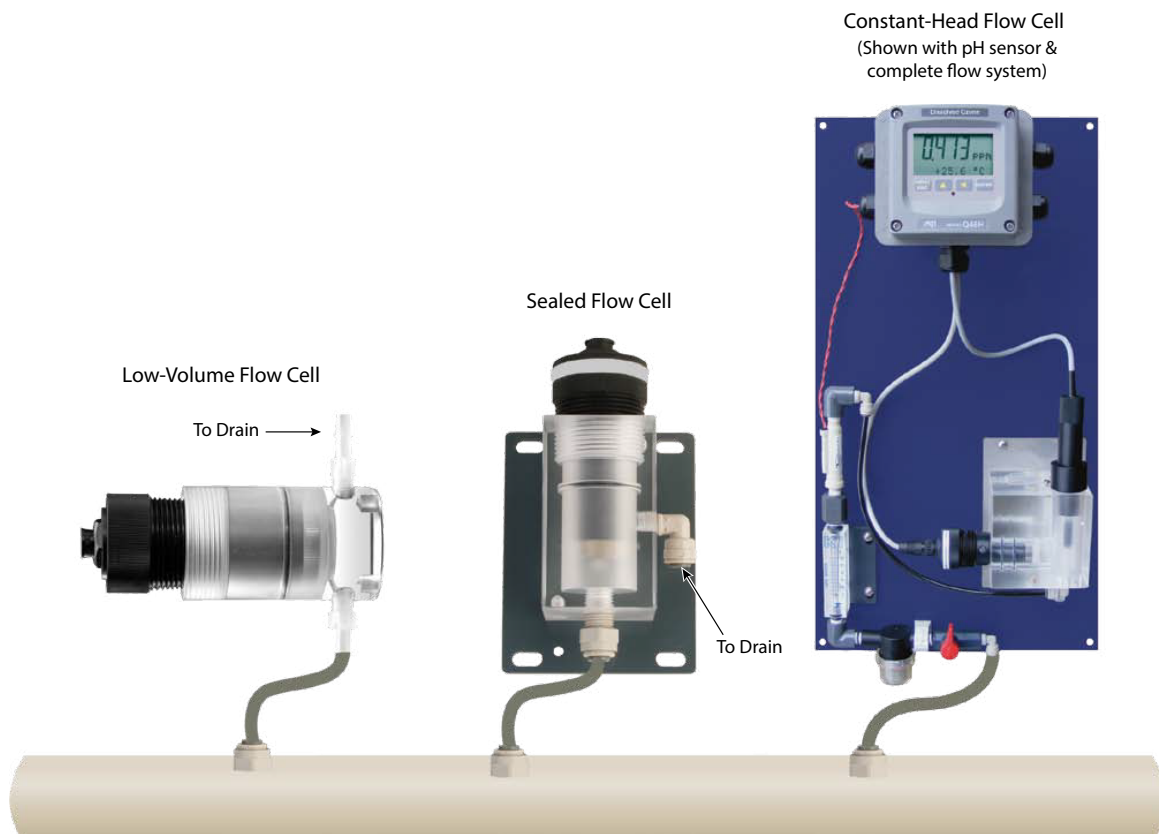


Figure 3: System overview

SPECIFICATIONS

Electronic Monitor

Display Range	0...2,000, 0...20.00 or 0...200.0 ppm
Accuracy	0.5% of selected range or 0.02 ppm
Repeatability	0.3% of selected range or 0.01 ppm
Zero Drift	< 0.01 ppm/month
Power	90...260V AC, 50/60 Hz, 10 VA max. 12...24V DC, 500 mA max.
Analog Outputs	Two isolated 4...20 mA, 500 Ω load max. (3rd output optional)
Relay Output	Three SPDT, 6A @250V AC, 5A @ 24V DC (3 additional SPST non-isolated, 1A @ 30V DC optional)
Display	4-digit, 0.75 in. numeric LCD with 12-digital second line, LED backlight
Enclosure	NEMA 4X Polycarbonate V-0 Flammability
Operating Conditions	32...122° F (0...50° C)
Weight	6 lb (2.7 kg) with sensor, flow cell and accessories 15 lb (6.8 kg) assembled into panel
Digital Output	Profibus DP, Modbus RTU, Modbus TCP/IP, Ethernet/IP, Datalogger

Sensor and Flow Cell

Sensor Type	Membrane-Covered Amperometric (Polarographic)
Wetted Materials	PVC and 316 SS
Sensor Cable	25 ft (7.5 m) standard
Response Time	90% in 60 sec
Sample Temperature	23...131° F (–5...55° C)
Sample Pressure	0...50 psig
Temperature Sensor	Internal Pt100 RTD
Flow Cell Materials	Acrylic with barb fittings
Sample Connections	1/4 in. I.D. hose barb inlet, 1/2 in. I.D. hose barb drain for standard flow cell

ORDERING INFORMATION

QF-A-B-C-D-E-F Dissolved Ozone Monitor

Suffix A - Power	
1	100...240V AC, $\pm 10\%$, 50/60 Hz
2	12...24V DC (requires 300 mA)
Suffix B - Sensor Type	
1A	Sensor, constant-head flow cell, 25 ft (7.5 m) cable
2A	Submersible sensor, 25 ft (7.5 m) cable
3A	Sensor, sealed low-volume flow cell
4A	Sensor, 1-1/2 in. flow tee
5A	Sensor, sealed flow cell
6A	Flow sensor only, no flow cell
Suffix C - pH Sensor Input	
1	None
2	Q22 pH sensor w/ battery preamp, 25 ft (7.5 m) cable
3	Standard pH sensor w/ 25 ft (7.5 m) cable & adapter for overflow cell
4	Standard pH sensor w/ 25 ft (7.5 m) cable & sealed flow cell
5	Q22 pH sensor, submersible

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 w/ flow controls, w/o flow switch
3	Panel w/ flow controls, w/ flow switch

ACCESSORIES

07-0100	NEMA 4X junction box
31-0001	5-c sensor interconnect cable, max. 100 ft (O ₃ only)
31-0038	7-c sensor interconnect cable, max. 100 ft (O ₃ / pH systems)
00-0628	Mounting bracket kit for submersible sensor
00-0570	Ozone sensor polarizer, flow cell style
05-0068	Panel mount bracket kit
47-0005	2 in. U-bolt, 304 SS
55-0057	Fixed flow regulator, 400 cc/min. 1/4 in. inlet & outlet, Viton

NOTES:

1. All systems are supplied w/ one package of membranes, one 120 cc bottle of electrolyte and one spare parts kit containing 3 each of all O-rings and special screws.
2. Suffix C, option 2, 3 or 4 allows Q46H to supply outputs for both chlorine and pH.
3. Flow cell for Cl₂ / pH combo systems should be kept within 25 feet of monitor.
4. Buffer packet for pH 4 & 7 supplied with Suffix C, option 2, 3 or 4.
5. Pipe mount requires two 2-inch U-bolts (47-0005).

