A Badger Meter® Brand

Water Quality Monitor

Q46H/62-63 Residual Chlorine

OVERVIEW

The Q46H/62-63 Residual Chlorine Monitor is a versatile on-line monitoring system designed for continuous measurement of free or combined chlorine, without the need for chemical reagents. The monitor uses a polargraphic membraned sensor that measures chlorine directly. Water simply flows past the sensor and directly to a drain, with the flow rate and pressure across the sensor being controlled by a constant-head or sealed flow cell assembly. The chlorine 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

The system is well suited for potable water treatment, cooling water, sea water, produce wash water, reverse osmosis membrane protection or activated carbon filter break-through detection. It is also well suited for chloraminated potable water systems, activated carbon filter break-through detection and for monitoring wastewater treatment effluents where sufficient ammonia is present to insure that the majority of the chlorine residual is monochloramine.

Q46H/62-63 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 signal relays, PID control and digital communication cards.

APPLICATIONS

- Potable Water
- Wastewater Effluent
- Cooling Water
- HighPurity WaterSystems

FEATURES

- **Free or Combined Chlorine.** Q46H monitors are factory set for either free or combined chlorine measurement, but they can easily be converted from one to the other in the field.
- **Economical Operation.** Reagentless operation and low parts cost makes the Q46H your best choice for chlorine monitoring applications in potable water, wastewater, cooling water or high purity water systems.
- **Automatic pH Compensation.** For free chlorine monitoring under widely varying pH conditions, automatic pH compensation may be added to maintain the highest measurement accuracy at pH levels up to 9.5.
- **Dual Chlorine/pH Monitoring.** Even when pH correction is not required, adding a pH sensor to the system converts the monitor to a dual analyzer, providing 4...20 mA outputs for both chlorine and pH.
- **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 90...260V AC or 12...24V DC.
- **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 chlorine and pH.
- **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.
- **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.
- **Flexible Mounting.** NEMA 4X (IP66) enclosure is suitable for wall, pipe or panel mounting.
- **Clear 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.

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Product Data Sheet

CHLORINESENSOR & FLOW CELL OPTIONS

Two types of chlorine sensors are available. One is designed for flow cell installation and the other is for submersion applications. Free chlorine monitoring should always be done using a flow cell system. Good control of sample flow and pressure is important for accurate measurement. The standard constant-head flow cell should be used for most applications. A sealed flow cell and a low-volume flow cell are also available for special applications. Consult a Badger Meter representative for application assistance.

Submersible combined chlorine sensors can sometimes be used for measuring total chlorine in wastewater effluent. Wastewater effluents containing more than 1 ppm of ammonia often result in a chlorine residual that is more than 90% monochloramine. Direct measurement with a submersible sensor can provide a dependable monitor without all the sampling and chemicals associated with total chlorine measurement.

Figure 1: Submersion and flow cell sensors

SENSOR STABILIZATION

Chlorine sensors, especially free chlorine, require up to 8 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

SYSTEM OPTIONS

Standard Q46H Systems are AC powered (100...240V AC, 50/60 Hz), or a DC powered (12...24V DC) version is also available. The basic system includes two isolated 4...20 mA outputs and 3 SPDT alarm relays.

If pH correction is required, or if pH measurement is also desired, an optional pH sensor is available. With this sensor connected, the second analog output may be configured for pH instead of temperature to provide a dual chlorine/pH monitor system.

Q46H systems may also be supplied with an additional output board. This output board may contain either a third 4...20 mA output or three additional low power relays. Adding the third analog output is the most common as the system then provides isolated outputs for chlorine, pH and temperature.

In addition to the analog output options, Q46H monitors may be supplied with digital communications. Communication options currently include Profibus DP, Modbus RTU, Modbus TCP/IP, Ethernet IP and Datalogger.

SPECIFICATIONS

Electronic Monitor

DisplayRange	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
Non-Linearity	0.1% of selected range
Temperature Drift	0.01% of span/°C
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)
Relays	Three SPDT, 6A @250V AC, 5A @ 24V DC (3 additional SPST non-isolated, 1A @ 30V DC optional)
	4-digit, 0.75 in. numeric LCD with 12-digital second line, LED backlight
Display	NEMA 4X Polycarbonate V-0 Flammability
Enclosure	–4...140° F (–20...60° C)
Operating Temperature	6 lb (2.7 kg) with sensor, flow cell and accessories 15 lb (6.8 kg) assembled into panel
Weight	< 0.01 ppm/month
Zero Drift	32...122° F (0...50° C)
Operating Conditions	Profibus DP, Modbus RTU, Modbus TCP/IP, Ethernet/IP, Datalogger
Digital Output	

Sensor and Flow Cell

Sensor Type	Membrane-Covered Amperometric (Polargraphic)
Optional pH Sensor	Combination pH sensor, with or without preamplifier
Materials	PVC and 316SS
Response Time	90% in 60 sec
Temperature Limits	23...131° F (–5...55° C)
Pressure Limit	0...50 psig
Sensor Cable	25 ft (7.5 m) standard
Sensor Flow Cell	Clear acrylic constant-head overflow standard (Sealed acrylic flow cell optional)
Sample Flow Rate	7...15 gph (0.5...1.0 lpm)

ORDERING INFORMATION

QM-A-B-C-D-E-F-G Chlorine Monitor

Suffix A - Power	
1	100...240V AC,±10%, 50/60Hz
2	12...24V DC (requires 300 mA)

Suffix B - Parameter	
62	Free chlorine
63	Combined chlorine

Suffix C - Sensor Type	
WW	None
1A	Sensor w/ constant-head flow cell and 25 ft (7.5 m) cable
2A	Submersible sensor w/ 25 ft (7.5 m) cable (combined chlorine only)
3A	Sensor w/ sealed low-volume flow cell
4A	Sensor w/ 1-1/2 in. flow tee (combined chlorine only)
5A	Sensor w/ sealed flow cell
6A	Flow sensor only, no flow cell (use with extreme caution)

Suffix D - 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

Suffix E - Digital Output	
1	None
2	Profibus DP
3	Modbus RTU
4	Ethernet/IP
5	Modbus TCP/IP
6	Datalogger

Suffix F - Optional Output	
A	None
B)	One additional 4...20 mA output
C	Three additional low power relays (SPST, 0.5 A max.)

Suffix G - System Assembly	
1	None
2	Panel w/ flow controls, w/o flow switch
3	Panel w/ flow controls, w/ flow switch
4	Panel w/ flow controls & buffer pump switch (no flow switch available)
5	Panel w/ flow controls & CO_2 gas injection (no flow switch available)

ACCESSORIES

07-0100	NEMA 4X junction box
31-0038	Sensor interconnect cable (max. 100 ft)
00-0628	Mounting bracket kit for submersible sensor
00-0570	Free chlorine sensor polarizer (flow)
00-0572	Combined chlorine sensor polarizer (flow)
00-0573	Combined chlorine sensor polarizer (submersion)
47-0005	2 in. U-bolt, 304 SS
05-0094	Panel mount bracket kit

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 D, option 2, 3 or 4 allows Q46H to supply outputs for both chlorine and pH.
3. Flow cell for Cl_2 / pH combo systems should be kept within 25 feet of monitor.
4. Buffer packet for pH 4 & 7 supplied with Suffix D, option 2, 3 or 4.
5. Pipe mount requires two 2-inch U-bolts (47-0005).

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