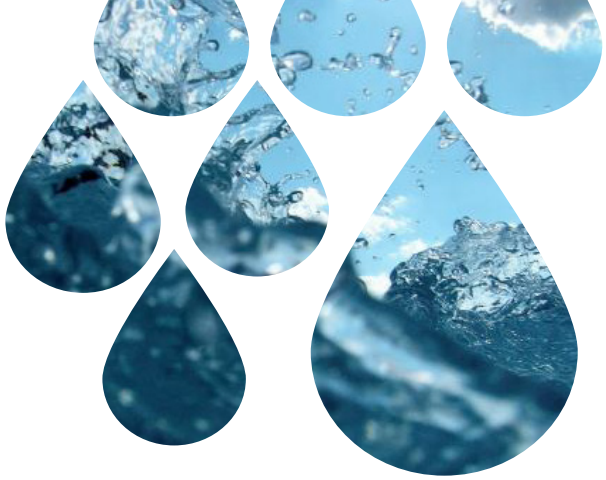
Call **800.959.0299** to speak with a sales representative
or visit us on the web at **www.analyticaltechnology.com**



pH/ORP**Monitor**

Model Q46P/R

pH/ORP sensors

INTRODUCTION.

Measurement and control of pH is important in a wide variety of industries. Water and wastewater, boiler feed water, high purity water, food processing wash water, chemical plant cooling water, and many other aqueous systems require reliable pH monitoring. ATI's **Model Q46P** pH monitor provides the combination of durability, accuracy, and versatility required for virtually any pH monitoring or control application. The **Model Q46R** provides the same reliable monitoring for Oxidation-Reduction Potential (ORP) applications.

ATI's Q46 platform represents our latest generation of monitoring and control systems. Control features have been expanded to include an optional 3rd analog output or an additional bank of low power relays. Digital communication options now include Profibus DP, Modbus RTU, or Ethernet IP variations.

Sealed Reference System ...
for *Longer Sensor Life*

ATi ANALYTICAL TECHNOLOGY, INC.

ATI's Q46P & Q46R monitors *provide a wide variety of options* to adapt to your application requirements.

pH Monitor

ORP Monitor

FEATURES.

Sensor Options. Choice of either "differential" or "conventional" pH sensors. Differential sensors provide reliable, long lasting service in demanding applications while conventional sensors provide a lower cost alternative for clean water applications.

Calibration. Automatic buffer recognition simplifies calibration.

Auto-Cleaning. Automatic "Air Blast" sensor cleaning system available for reducing maintenance in applications where sensor fouling is a problem.

AC or DC Power Options. Power options include universal 100-240 VAC +/- 10% or 12-24 VDC.

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 pH/ORP and temperature.

PID Output. Standard PID control function assignable to one analog output.

Digital Communications. Three digital communication protocols are available: Profibus DP, Modbus RTU, or Ethernet IP.

Relay Outputs. Three SPDT relays are standard, with relay functions programmable for alarm, control, or trouble indication. An additional three internal low-power relays provide control of the automatic sensor cleaning function.

Flexible Mounting. NEMA 4X (IP-66) enclosure is suitable for wall, pipe, or panel mounting.

Clear Display. Back-lit large LCD display provides clear visibility in any lighting conditions. A scrolling second line on the display provides additional information and programming prompts.

ELECTRONIC MONITOR SPECIFICATIONS

Display Range	[pH] 0 to 14 [ORP] -1000 to +2000 mV
Accuracy	0.5% of selected range
Repeatability	0.3% of selected range
Non-Linearity	0.1% of selected range
Temperature Drift	0.01% of span/°C
Power	100-240 VAC +/- 10%, 50/60 Hz, 10 VA max.; 12-24 VDC, 500 mA max.
Analog Outputs	Two isolated 4-20 mA, 500 Ω load max. (3rd output optional)

Relays	Three SPDT, 6A @250 VAC, 5A @24 VDC (3 additional SPST non-isolated, 1A @30 VDC optional)
Display	4-digit, 0.75" numeric LCD with 12-digit second line, LED back light.
Enclosure	NEMA 4X (IP-66) Polycarbonate, V-0 flammability
Operating Conditions	-20 to 60°C (-4 to 140°F)
Weight	6 lbs. (2.7 kg) with sensor, flowcell and accessories
Digital Output	Options for Profibus DP, Modbus RTU, or Ethernet IP

AUTOMATIC SENSOR CLEANING.

Accurate pH (or ORP) measurement requires that sensing surfaces be clean. The surface of a pH glass element covered with biological or chemical coatings will not provide reliable measurements and must be removed, either automatically or manually. Sensor fouling is rarely an issue in potable water or high purity water applications, but wastewater treatment, raw water monitoring, and many industrial water monitoring applications demand regular sensor cleaning. With operations and maintenance personnel often in short supply, sometimes simple yet critical cleaning functions can be overlooked until inaccurate measurements cause other problems.

Auto-Clean Sensor

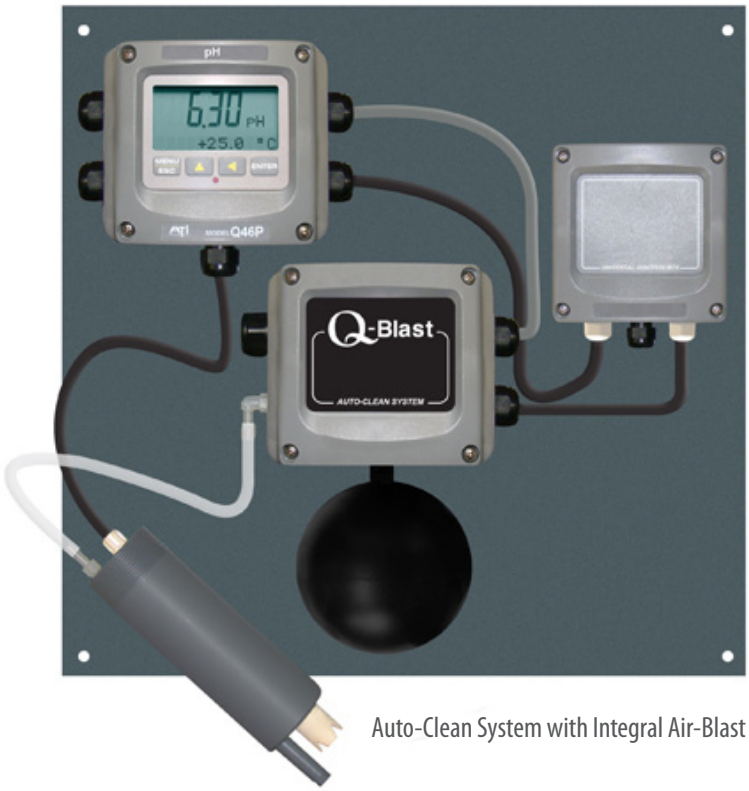
Q-Blast

Trust the *Original*
Air-Blast System.

ATI's Q-Blast option provides the ideal answer for automatic pH or ORP sensor cleaning. Employing a unique "air-blast" cleaning method, sensors can be cleaned as often as necessary without operator attention. Pulses of pressurized air delivered through a nozzle at the tip of the sensor remove accumulated solids from critical sensing surfaces, resulting in accurate and reliable measurements.

The Q-Blast Auto-Clean assembly is housed in a NEMA 4X enclosure suitable for indoor or outdoor use. The system includes an integral compressor and air-pulse control components, with a power supply for the entire air supply system incorporated into the design. A simple connection to the Q46P or Q46R monitor provides the sequencing for the system and allows the operator to select cleaning frequencies as often as once every hour to as little as once every 999 hours. To insure performance in extremely cold conditions, a thermostatically controlled heater is included in the assembly, allowing operation down to -40°C.

A *Blast* of *Air*
keeps the
Auto-Clean
Sensor
Clean!



Auto-Clean System with Integral Air-Blast

CONVENTIONAL SENSORS.

There is no single pH sensor that fits every application. Sensors designed for harsh environments do not necessarily work as well in high purity water. Understanding the difference between various sensor types will help you choose the best sensor for your application.

The most widely used pH sensors contain a hydrogen ion sensitive glass measuring electrode and a silver/silver chloride reference element. The reference element is sealed inside the sensor body filled with an electrolyte and electrically connected to the outside solution through one or more porous reference junctions. The glass electrode is in direct contact with the measured solution.

Conventional sensors are a good alternative for clean water applications with conductivity above about 50 microsiemens (µS). They typically provide an operating life of 1-3 years depending on the application and are relatively inexpensive. They are available in submersible or in-line versions and a clear flowcell is also available. Maximum cable length is 25 feet (7.7 m) for this type of sensor. A preamplifier in a NEMA 4X enclosure is available for applications requiring longer distances between the sensor and monitor.

Submersible Sensor

Twist-Lock Sensor
(with or without pipe adapter)

Sealed Acrylic Flowcell

High Purity Water Sensor

For simpler applications such as filtered potable water, high purity boiler feed water, pharmaceutical grade water, or very cold clean water applications, conventional sensors can be a better choice. In clean applications where there is little to attack the reference system, this type of sensor provides a much lower impedance sensor that can be used without an internal preamplifier, making the cost of the sensor significantly less. In addition, special versions of this sensor are available that provide high flow reference systems allowing better stability in very low conductivity water applications. ATI can help with your application questions.

Superior Sensor Technology
for *Advanced Process Measurement.*

High Purity Water Sensor & Flowcell

DIFFERENTIAL SENSORS.

In this type of sensor, the silver/silver chloride reference element has been replaced by a pH sensitive glass electrode identical to the measuring electrode. This second glass electrode is housed in a chamber filled with pH 7 buffer which provides a stable reference. A high surface area reference junction electrically connects this reference system to the pH measuring element. The result is that pH is measured by the voltage difference between the two pH sensitive glass elements.

Differential Sensors

Differential pH sensors are the best choice for demanding applications such as wastewater, plating baths, aggressive industrial process water, or higher temperature applications. They are especially good in applications containing sulfur compounds that tend to poison the silver/silver chloride reference element found in conventional sensors. Because they are designed with replaceable reference junctions and have internal preamplifiers, these sensors tend to significantly outlast conventional sensors.

SENSOR SPECIFICATIONS

Measuring Range	0 to 14 pH, -1000 to +2000 mV
Sensitivity	0.002 pH; 0.2 mV
Stability	0.02 pH; 2 mV (per 24 hours, non-cumulative)
Wetted Materials	PEEK, ceramic, titanium, glass, Viton, EPDM, Platinum or Gold (ORP only) 316SS with Sanitary or insertion body styles
Temperature Compensation	Pt1000 RTD

Sensor Cable	6 conductor plus 2 shields, HDPE jacket
Temperature Range	-5 to 95°C (23 to 203°F)
Pressure Range	0-100 PSIG
Max. Flow Rate	10 ft (3 m) per second
Max. Sensor to Analyzer Distance	3,000 ft (914 m)
Sensor Body Options	1" NPT Convertible 1-1/4" Insertion 1-1/2" or 2" Sanitary-style

SENSOR MOUNTING OPTIONS.

Convertible-style sensors may also be used with a modified 1" flow tee that accommodates the pipe thread on the front of the sensor. Sample flows directly toward the face of the sensor to prevent build up of solids. When using this sensor for submersion application, hardware is available for mounting the sensor to standard handrails, facilitating sensor removal for cleaning and calibrating.

The 1-1/2" or 2" union mount systems can be used with pipe sizes up to 2 inches. The union mount hardware allows for easy removal of the sensor from the hardware without twisting the sensor cable.

1" Flow Tee

Union-Mount

Special insertion mounting hardware is available for applications requiring the removal of the sensor from a process line or tank without shutting off the sample flow in the line. This hardware is available in 316SS or CPVC construction.

Q46P/R **ORDERING INFORMATION**

MODEL Q46 A-B-C-D-E pH/ORP Monitor

Suffix A - Measurement Type
P - pH
R - ORP

Suffix B - Power
1 - 100-240 VAC +/- 10%, 50/60 Hz
2 - 12-24 VDC, (requires 300 mA)

Suffix C - Cleaning System
1 - No cleaning system
2 - Automatic sensor Air-Blast cleaner, 100-240 VAC +/- 10%
3 - Automatic sensor Air-Blast cleaner, 12-24 VDC

Suffix D - Digital Output
1 - None
2 - Profibus DP
3 - Modbus RTU
4 - Ethernet IP

Suffix E - Optional Output - Not Available with Auto-Clean
1 - None
2 - One additional 4-20 mA output
3 - Three additional low power relays (SPST, 0.5 A max.)

ACCESSORIES

05-0094 Panel Mount Bracket Kit
47-0005 2″ U-bolt, 304SS
00-1637 Q-Blast Assembly with Power J-Box and Mounting Rails

NOTES:

1 - Pipe mount requires two 2″ U-bolt (47-0005).

SENSOR OPTIONS

07-0100 Sensor Junction Box, NEMA 4X
31-0057 Sensor Interconnect Cable
03-0029 Cable Assembly with Connector, 25 ft
00-0624 Submersion Mounting Hardware for Auto-Clean Sensor
00-0628 Submersion Mounting Hardware for Standard Sensor
07-0209 1″ NPT Tee, CPVC
07-0221 1-1/2″ NPT Union/Tee Mount, CPVC, No Tee
44-0219 1-1/2″ NPT Tee, Schedule 80, CPVC
07-0210 2″ NPT Union/Tee Mount, CPVC, No Tee
44-0233 2″ NPT Tee, Schedule 80, CPVC
00-1391 External Preamp for Conventional Sensors, NEMA 4X
00-1527 Sealed Flowcell for 63-0013 or 63-0008 Sensors
63-0017 3/4″ Flow Tee Adapter for 63-0008 or 63-0013 Sensors
63-0021 1″ Flow Tee Adapter for 63-0008 or 63-0013 Sensors

MODEL Q25 A-B-C Differential Sensor

Suffix A - Electrode Type
P1 - pH: industrial glass
P2 - pH: municipal glass
P3 - pH: antimony metal (HF applications only)
R1 - ORP: platinum metal
R2 - ORP: gold metal

Suffix B - Sensor Type
1 - 1″ NPT convertible-style PEEK
2 - Insertion-style, 316SS
3 - 1-1/2″ sanitary-style, 316SS
4 - 2″ sanitary-style, 316SS
5 - Auto-Clean Sensor, with nozzle, Noryl (Submersion only)
6 - Convertible-Style, PEEK, with connector (See Note 1 & 2)

Suffix C - Sensor Cable Length
1 - 15 ft (4.6 m)
2 - 30 ft (9.2 m) (standard with Auto-Clean sensor)
3 - 60 ft (18.4 m)
9 - Special

NOTES:

1 - Sensor with integral connector is not waterproof. Used for indoor applications only.

2 - Suffix B, Option 6 requires 03-0029 cable

3 - Auto-Clean sensors supplied with 30 (or 60) ft of 1/4″ ID PVC tubing depending on sensor cable.

CONVENTIONAL pH/ORP SENSORS

63-0013 Flow Type pH Sensor, 25 ft Cable, Pt100, Twist-lock
63-0009 Submersible pH Sensor, 25 ft Cable, Pt100
63-0008 Flow Type Pt. ORP Sensor, 25 ft Cable, No Temp., Twist-lock
63-0023 Submersible Pt. ORP Sensor, 25 ft Cable, No Temp.
07-0092 Q25 Style Combination Sensor with Connector (requires 03-0029 cable)
07-0149 Q25 Style Combination Sensor, 30 ft Cable

CALIBRATION ACCESSORIES

09-0034 pH 4 Buffer, 1000 mL
09-0035 pH 7 Buffer, 1000 mL
09-0036 pH 10 Buffer, 1000 mL
05-0056 Quinhydrone Powder, 5 g
09-0042 200 mV ORP Solution, 500 mL
09-0043 600 mV ORP Solution, 500 mL

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