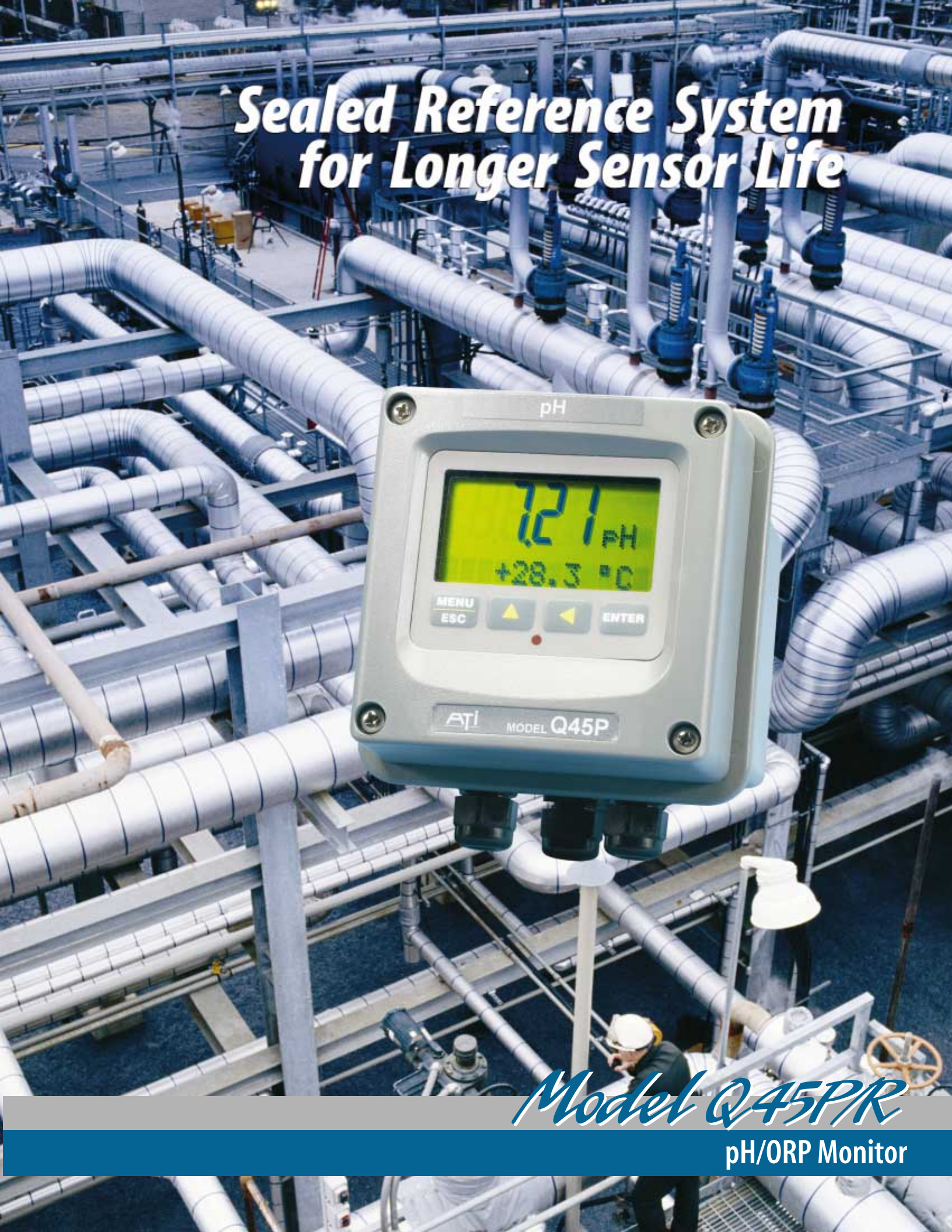

Model Q45PR

pH/ORP Monitor

Superior Sensor Technology For Advanced Process Measurement

Sensor Mounting Configurations

ORP Monitor

The "Differential" Difference

ATI's versatile Q45P/R pH/ORP system is designed for use in all industrial and municipal applications. The sensors are engineered to function normally in applications where conventional sensors quickly fail.

Conventional pH/ORP sensors have an "open reference system," which means the reference element and electrolyte are in contact with the process. This allows chemicals to diffuse into the reference chamber and alter the reference system. As the reference junction becomes contaminated, the reference potential shifts. As chemicals attack the silver reference wire, the reference potential shifts and the sensor no longer functions. When any of these problems occur, cleaning and calibration cycles increase and the sensors fail much faster, all of which costs you time and money.

The differential pH/ORP sensors utilize a "sealed reference system," where the sensors are constructed with a second glass pH electrode as the reference element. The glass reference system protects the sensor from chemical poisons (sulfide, cyanide, chlorine, bisulfite, etc.) that destroy conventional pH sensors.

A large volume, dual junction saltbridge is used to maximize the in-service time of the sensor. The annular junction provides a large surface area to minimize the chance of fouling. Large electrolyte volume and dual junctions minimize contamination of the reference solution. The replaceable saltbridge allows for easy and inexpensive sensor regeneration.

An integral preamplifier is encapsulated in the body of the sensor. This creates a low impedance signal output which ensures stable readings in harsh environments, and maximizes the distance between sensor and analyzer. Sensor diagnostics are used to alarm the user in the event of electrode breakage, loss of sensor seal integrity, or integral temperature sensor failure.

Sensor electrodes can be user-specified to ensure measurement reliability and maximum sensor lifetime. The type of glass used in the pH electrodes can be selected for optimal performance. The metal electrode used for ORP measurement can be platinum or gold, depending on the chemical makeup of the process solution.

All sensors are available in several mounting configurations. The 1" NPT convertible-style sensor is constructed of PEEK®, a high performance thermoplastic that provides outstanding mechanical strength and chemical resistance. An insertion-style sensor is available in 316SS for hot tap applications. The mounting hardware for the insertion sensor is either CPVC or 316SS, and is mounted using a 1-1/4" NPT full-ported ball valve. The sensors are also available with 1-1/2" or 2" sanitary-style fittings.

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®, EDPM Platinum or gold (ORP only) 316 Stainless Steel 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°C).
Pressure Range:	0 to 100 psig
Max. Flow Rate:	10 feet (3 meters) per second
Max. Sensor to Analyzer Distance:	3,000 feet (914 meters)
Sensor Body Options:	1" NPT Convertible 1-1/4" Insertion 1-1/2" or 2" sanitary-style

Monitor Specifications

Display Parameters:	
Main input:	[pH] 0 to 14 [ORP] -1000 to +2000 mV
Sensor voltage:	[pH] ±500 mV
Loop current:	4.00 to 20.00 mA
Sensor temperature:	-10 to 110°C (14 to 230°F)
Main Parameter Range:	0.00 to 14.00 pH, -1000 to +2000 mV
Input Impedance:	$>10^{13}$ Ohms
Repeatability:	0.1% of span or better
Sensitivity:	0.05% of span
Non-linearity:	0.1% of span
Stability:	0.05% of span per 24 hours
Temperature Drift:	Span or zero, 0.02% of span/°C
Warm-Up Time:	7 seconds to rated performance
Response Time:	6 seconds to 90% of step input at lowest setting
Max. Sensor to Analyzer Distance:	3000 feet (914 meters) w/preamp 25 feet (7.6 meters) w/o preamp
Sensor Types:	Q-Series pH or ORP with preamp, 5-wire input; combination-style pH or ORP with temperature compensation
Enclosure:	NEMA 4X, IP66, polycarbonate, weatherproof and corrosion resistant, (HWD): 4.9" (124 mm) x 4.9" (124 mm) x 5.5" (140 mm)
Mounting Options:	Wall, panel, pipe/handrail
Conduit Openings:	Three M16 threaded entries, 3 cord-grips and 2 conduit adapters included
Weight:	2-wire or battery units: 1 lb. (.45 Kg) AC power units: 2 lbs. (.9 Kg) Auto-Clean units: 15 lbs. (6.8 Kg.)
Display:	Large, high-contrast, super-twist (STN) LCD 4-digit main display with sign, 0.75" (19.1 mm) seven-segment characters; 12-digit alpha-numeric second line display, 0.3" (7.6 mm) 5 x 7 dot matrix characters
Ambient Temperature:	
Service:	-20 to 60°C (-4 to 140 °F)
Storage:	-30 to 70°C (-22 to 158 °F)
Ambient Humidity:	0 to 95%, non-condensing
Location:	Designed for hazardous and non-hazardous areas
EMI/RFI Influence:	Designed to EN 61326-1
Output Isolation:	600 V galvanic isolation
Filter:	Adjustable, 0-9.9 minutes additional damping to 90% step input
Temperature Input:	Selectable Pt1000 or Pt100 RTD with automatic compensation
Power:	16-35 VDC for loop-powered unit; 115/230 VAC, 50/60 Hz., 10 VA Max. 9-volt battery for battery operated portable
Control Relays:	Two SPDT relays, 6A @ 250 VAC, 5A @ 24 VDC, resistive
Relay Mode:	Programmable for control, alarm, or timer function
Analog Outputs:	Isolated 4-20 mA, 550 ohm max. load. Two assignable 4-20 mA outputs, 550 ohm max. (AC only)
Data Logger:	Battery version only, stores 32,000 data points

Auto-Clean Option

The Q45P/R Auto-Clean System is designed to extend sensor cleaning intervals on pH and ORP sensors that are mounted in applications containing high levels of solids contamination. The Auto-Clean System uses high pressure air to remove contaminants from the face of the sensor automatically.

Our Auto-Clean System utilizes a self contained compressor and air cylinder to generate a series of high pressure air blasts. Each cleaning cycle lasts approximately 2 minutes, during which the monitor outputs are placed in a HOLD condition to prevent false readings or alarms.

The concentration of solids in the process will determine the cleaning frequency of the system. The user can vary the cleaning cycle frequency from as often as once every two hours to as little as once a day.

Although the Q45A Auto-Clean System can greatly extend sensor cleaning intervals, the user must still clean and calibrate the sensor at some interval. For a typical pH or ORP measurement in wastewater treatment, the system can extend weekly cleaning intervals to once every three months. Cleaning systems are not suitable for removing hard scale such as that caused by lime.

Auto-Clean Monitor

Auto-Clean Sensor

Standard Sensor Compatibility

The Q45P/R monitors can be easily configured to accept the input from a traditional combination sensor. For applications where a specialty sensor is required, ATI offers a line of standard sensors to meet your needs.

The unique "Lock-N-Load" system is pipe mounted and provides quick and easy isolation of the sensor from a flowing stream. The self-sealing sensor holder allows the sensor to be removed for maintenance without shutting down the process stream.

For high purity water (conductivity below 20 microSiemens), a special sensor is used in conjunction with a stainless steel flow assembly. This system is designed to minimize interference (noise, streaming potentials, CO_2, etc.) and provide a stable pH measurement.

Sensor Features

Differential-Style Sensor: The reference element is a second glass pH electrode immersed in a reference buffer solution. This glass reference system allows the sensor to be used in applications that poison conventional pH sensors.

Peek® Sensor Body Construction: All structural components are made of PEEK®, a high performance thermoplastic that provides outstanding mechanical strength and chemical resistance.

Replaceable Sensor Saltbridge: A large volume, dual junction saltbridge is used to maximize the in-service time of the sensor. The replaceable saltbridge allows for easy and inexpensive sensor regeneration.

Sensor Diagnostics: Sensor diagnostics are used to alarm the user in the event of electrode breakage, loss of sensor seal integrity, or integral temperature sensor failure.

Multiple Sealing Materials: Multiple sealing materials are used to preserve sensor integrity over a wide range of chemical processes and varying temperatures.

Integral Preamplifier: The integral preamplifier is encapsulated in the body of the sensor. This creates a low impedance signal output which ensures stable readings in harsh environments, and maximizes the distance between sensor and analyzer.

Monitor Features

Loop-powered, AC, or Battery Versions: This line of microprocessor based instrumentation allows for easy implementation of loop-powered, line-powered, or battery-powered capability within the same instrument. It can be rapidly converted between any of these versions with no requirement for software change

- Loop-powered (16-35 VDC) transmitter, 4-20 mA output
- Line-powered (115/230 VAC) analyzer, dual relays, dual 4-20 mA outputs
- Battery-powered (9 VDC) monitor/data logger, dual 0-2.5 VDC outputs

Sensor Compatibility: Q45 Monitors can accept standard pH sensor inputs, allowing easy upgrade for existing installations.

Dual Alarm Relays/Analog Outputs: AC operated systems provide two relays that are configurable for control, alarm or timer mode of operation.

Diagnostic Messaging: Diagnostic messages provide a clear description of system condition, which eliminates confusing error codes that are difficult to decipher.

Flexible Calibration: Two-point and sample calibration options include auto-buffer recognition for 13 built-in buffer tables. Manual override of the automatic buffer values allows for user to customize values. All calibration methods include stability monitors to check temperature and main parameter stability before accepting data.

Standard PID Output: A PID control output is standard in every Q45 pH or ORP monitor, with control parameters easily user configurable.

Ordering Information: 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 Style
- 1 - 1" NPT convertible-style, PEEK
- 2 - Insertion-style, 3316SS
- 3 - 1-1/2" sanitary-style, 316SS
- 4 - 2" sanitary-style, 316SS
- 5 - Auto-Clean

Suffix C - Sensor Cable Length
- 1 - 15 feet
- 2 - 30 feet
- 9 - Special

OPTIONS:

05-0057	P1/P3/ORP sensor regeneration kit
05-0067	P2 sensor regeneration kit
09-0034	pH 4.00 buffer, 1,000 mL
09-0035	pH 7.00 buffer, 1,000 mL
09-0036	pH 10.00 buffer, 1,000 mL
09-0045	pH 6.87 buffer, 500 mL
09-0037	pH 9.18 buffer, 500 mL
09-0042	200 mV solution, 500 mL
09-0043	600 mV solution, 500 mL
05-0056	Quinhydrone powder, 5 grams

Ordering Information: Model Q45-A-B-C pH/ORP Monitor

Suffix A - Measurement Type
- P - pH
- R - ORP

Suffix B - Power
- 1 - 24 VDC, 2-wire (single output only)
- 2 - 115 VAC with 2 relays
- 3 - 230 VAC with 2 relays
- 4 - Battery operated with two 0-2.5 VDC outputs
- 5 - Battery operated with internal data-logger
- 6 - Auto-Clean, 115 VAC
- 7 - Auto-Clean, 230 VAC

Suffix C - Heater (for Auto-Clean only)
- 1 - None
- 2 - Heater/thermostat

Options:

07-0100	Junction box
31-0057	Sensor interconnect cable
07-0202	Submersion mounting hardware
47-0005	2" U-bolt, 304SS
05-0068	Panel mount bracket kit

Notes

1. All sensor cable lengths greater than 30 feet requires a junction box (07-0100) and sensor interconnect cable (31-0057)
2. PEEK sensor body is only available in convertible style.
3. Pipe mount requires two 2" U-bolts (47-0005).
4. Panel mount requires bracket (05-0068).

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