

Models Q45P and Q45R

Isolated pH and ORP Monitor/Analyzer Systems

- PEEK[®] Sensor Body Construction
- Dual-Glass Style Sensor
- Replaceable Sensor Saltbridge
- Electrode Breakage Diagnostic
- Universal Mounting Configurations
- Microprocessor Based System
- Loop, Line, or Battery-Powered
- Data Logging Options
- Fully Isolated Output(s)
- Large High-Contrast Display
- Superior Sensor Warranty



Sensor Features

Sensor housings are constructed of PEEK[®], a high performance thermoplastic that provides outstanding mechanical strength and chemical resistance. Multiple sealing materials are used to preserve sensor integrity over a wide range of applications.

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 reference junctions minimize contamination of the reference solution. The replaceable saltbridge allows for easy sensor regeneration.

The reference element of the sensor 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.

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 electrode can be selected for optimal performance. The metal electrode used for ORP measurement can be platinum or gold, depending on chemical makeup of the process solution.

All Q25 Sensors are backed by a superior warranty (see back page).

Monitor/Analyzer Features

This line of microprocessor-based instrumentation allows easy implementation of portable, loop-powered, or line-powered analyzer capability within the **same** instrument. The standard Q45P and Q45R instruments 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) Transmitter, 4-20 mA output**
- **115/230 VAC Analyzer, dual relays, dual 4-20 mA outputs**
- **Battery-powered (9 VDC) portable version, for view-only measurement**

The large, high contrast, super-twist display provides excellent readability over a wide operating temperature range, even in low light conditions. The main display line consists of large, segmented characters with measurement units. The secondary display line utilizes easily readable dot matrix characters for clear display of calibration and diagnostic messages. Two of four measured parameters may be displayed simultaneously.

Four-button programming provides intuitive navigation through the menu driven user interface. The 4-20 mA output(s) can be configured to represent any portion of the measurement range. Output HOLD, ALARM and SIMULATION features provide the user with complete control of the system output under any condition.

Diagnostic messages provide a clear description of system condition, which eliminates confusing error codes that must be looked up in the instruction manual.

The flexible two-point and sample calibration options include auto-buffer recognition from thirteen built-in buffer tables. Manual override of the automatic buffer values allows the user to customize calibration values. To ensure high accuracy, all calibration methods include stability monitors that check temperature and main parameter stability before accepting data.

Q25 Sensor Specifications

Q25P

Q25R

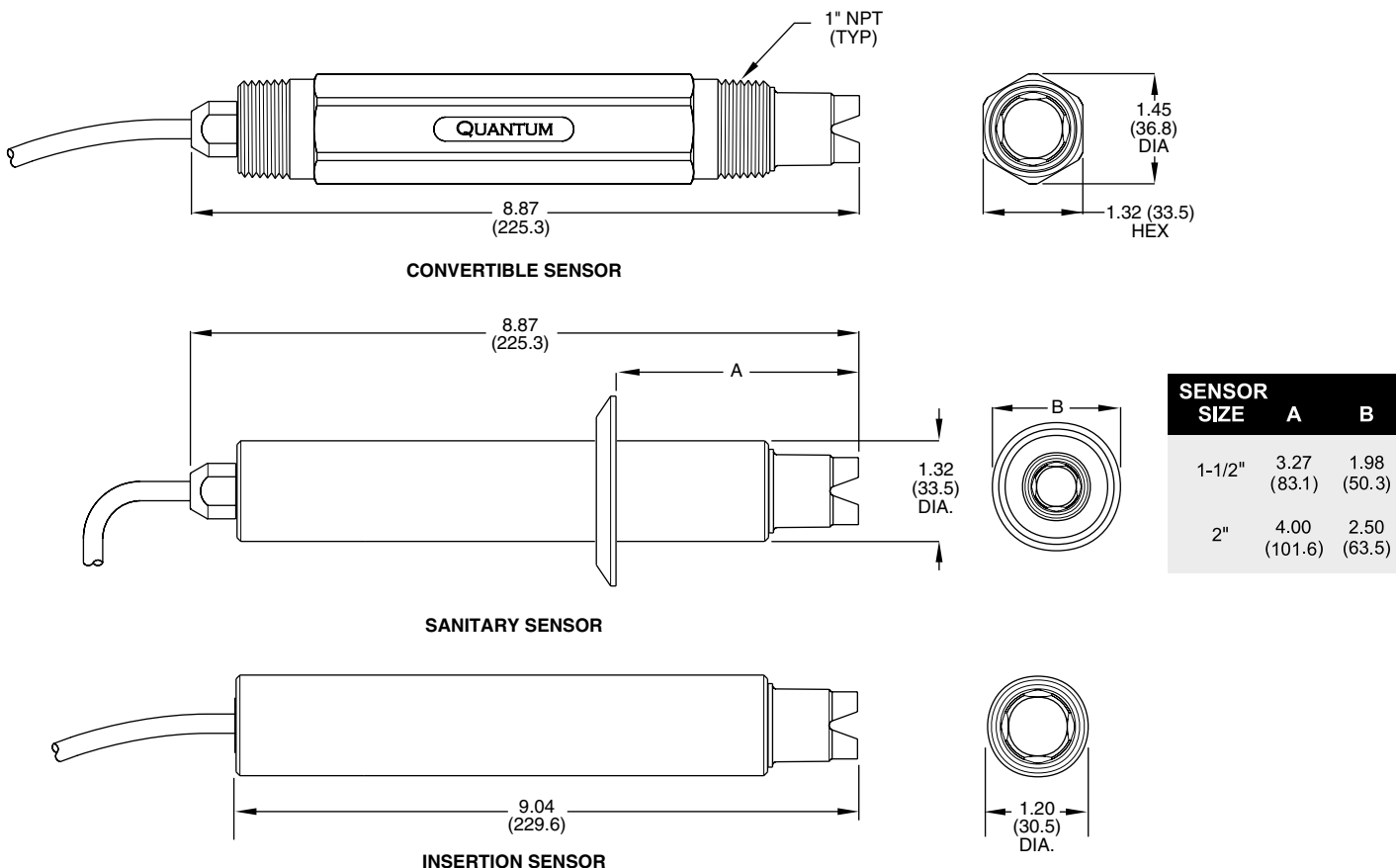
Measuring Range	0 to 14.00 pH	-1000 to +2000 mV
Sensitivity	0.002 pH	0.2 mV
Stability	0.02 pH per 24 hours, non-cumulative	2 mV per 24 hours, non-cumulative
Wetted Materials	PEEK®, ceramic, titanium, glass, Viton®, EDPM (316 stainless steel with 316SS body option)	PEEK®, ceramic, titanium, glass, platinum or gold, Viton®, EDPM (316 stainless steel with 316SS body option)
Temperature Compensation	Pt1000 RTD	Pt1000 RTD
Sensor Cable	6 conductor plus 2 shields	6 conductor plus 2 shields
Temperature Range	-5 to 95° C (23 to 203° F)	-5 to 95° C (23 to 203° F)
Pressure Range	0 to 100 psig	0 to 100 psig
Maximum Flow Rate	10 feet (3 meters) per second	10 feet (3 meters) per second
Maximum Sensor to Analyzer Distance	3000 feet (914 meters)	3000 feet (914 meters)
Sensor Body Options	1" NPT convertible, 1¼" insertion, 1½" or 2" sanitary style	1" NPT convertible, 1¼" insertion, 1½" or 2" sanitary style
Weight/Shipping Weight	1 pound (0.45 kilogram)	1 pound (0.45 kilogram)

Manufacturer's Notes

- CAUTION!** The type of hardware used to mount the sensor may limit the maximum temperature and pressure ratings. Please consult the hardware manufacturer's specifications to obtain the relevant temperature and pressure rating information.
- The maximum flow rate specification should be decreased for process solutions with low ionic conductivity or high suspended solids concentration. High flow rates in low ionic conductivity processes may cause a measurement error due to static electrical discharge. High flow rates in processes with high suspended solids concentration may decrease the functional life of the sensor by eroding the pH-sensitive glass electrode.

Sensor Dimensions and Mounting Configurations

Dimensions: Inches (mm)



Q45P/Q45R Instrument Specifications (NOT common to all variations)

Basic 2-Wire Transmitter:

Power	16-35 VDC (2-wire device)
DC Cable Max. Length	3000 feet (914 meters)
DC Cable Type	Belden twisted-pair, shielded
Insertion Loss	15.5 VDC

115/230 VAC Option:

Power	115/230 VAC $\pm 10\%$, 50/60 Hz 4 kV line isolation
Fuse	250 mA slow-blo on hot line, auto-reset secondary

115/230 VAC + Dual Relays Option:

Power	115/230 VAC $\pm 10\%$ 50/60 Hz
Fuse	250 mA slow-blo on hot line, auto-reset secondary
Relays	Electromechanical: Dual SPDT, 6-amp @ 250 VAC, 5 amp @ 24 VDC contacts, resistive

Solid-State (AC):
Dual SPST (N.O.) 0.06-2.0 amp @ 12-280 VAC, RMS

Solid-State (DC):
Dual SPST (N.O.) 3 amp @ 60 VDC

Software selection for setpoint, phase, delay, deadband, hi-lo alarm, and failsafe. A-B indicators on main LCD. Timer mode for auto-cleaning.

Analog Outputs

Dual 4-20 mA current loops, one for main parameter and one for temperature. Max load 500 Ohms on main and 500 Ohms on temperature.

Battery Option:

Power	Generic 9 VDC alkaline battery
Auto-OFF Time	2 hours after no key press
Low Battery Indication	6.75 VDC
Battery Life	Normal use (2-4 hours per week), 4-6 months Continuous operation, 10-14 days

Analog Outputs

Dual isolated 0-2.5 VDC (1pH and 1 Temperature)

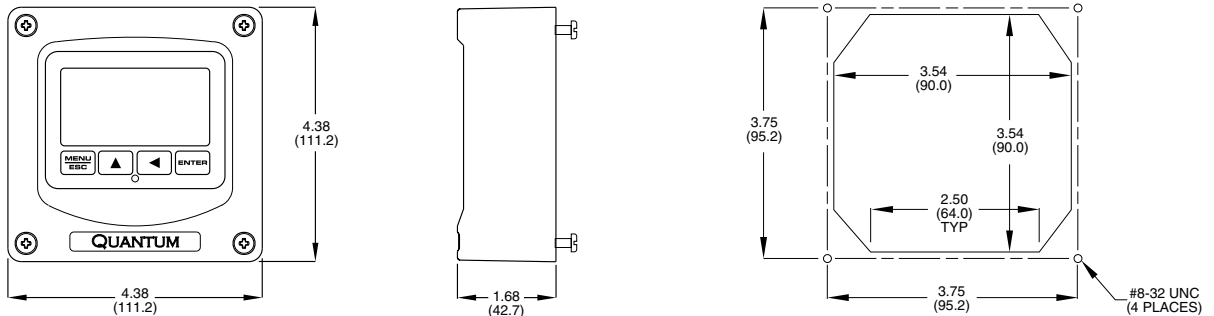
Data Logger

Optional Internal Logger, 32,000 data point capacity, programmable storage interval

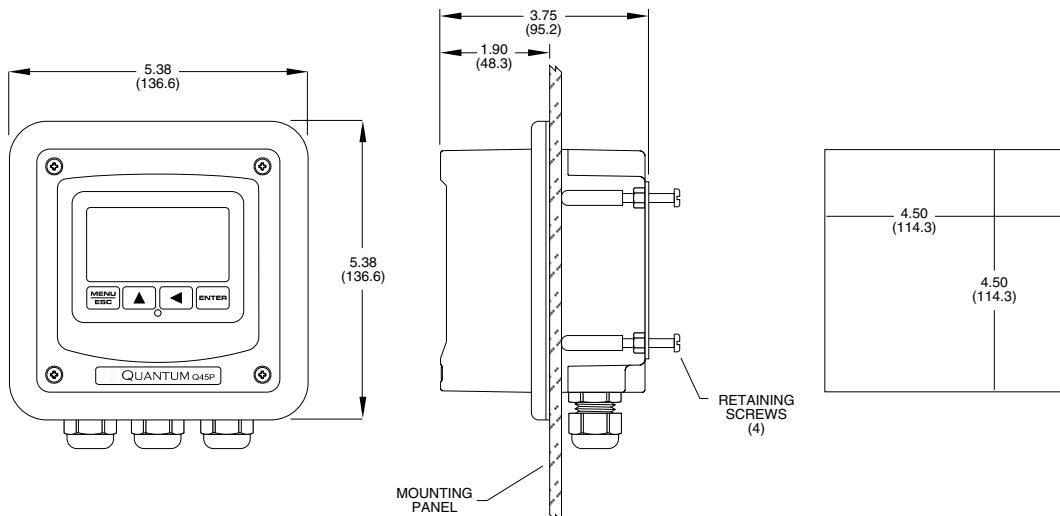
Panel Mount and Cut-Out

Dimensions: Inches (mm)

Standard

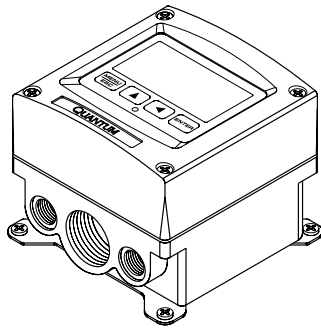


Relay Version

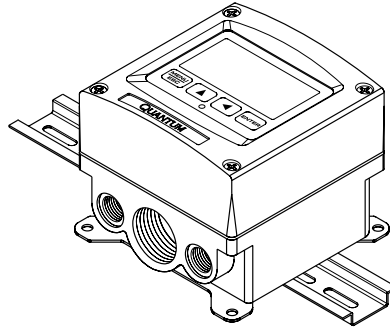


Analyzer Dimensions and Mounting Configurations

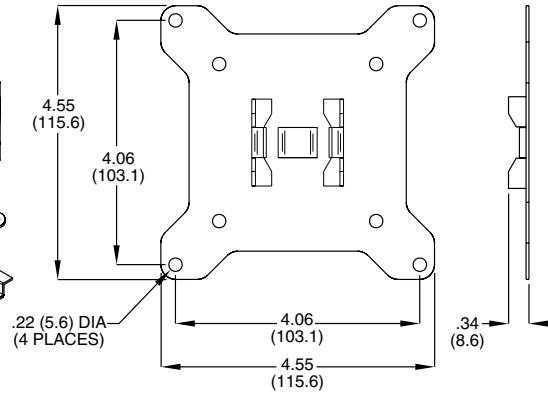
Dimensions: Inches (mm)



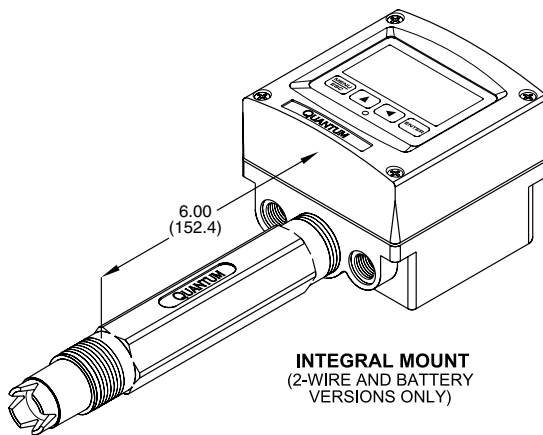
WALL MOUNT



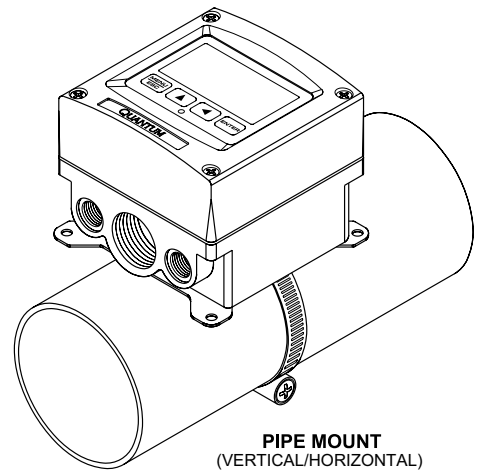
DIN RAIL MOUNT
(STANDARD 35 mm DIN)



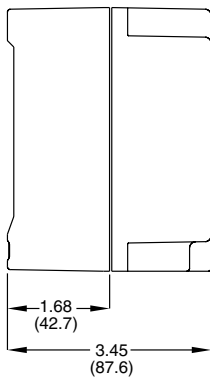
MULTI-PURPOSE BRACKET



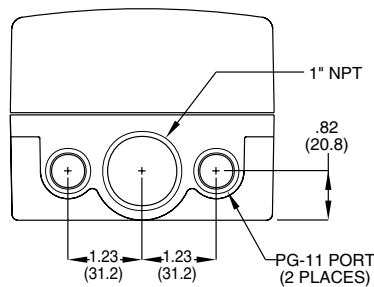
INTEGRAL MOUNT
(2-WIRE AND BATTERY VERSIONS ONLY)



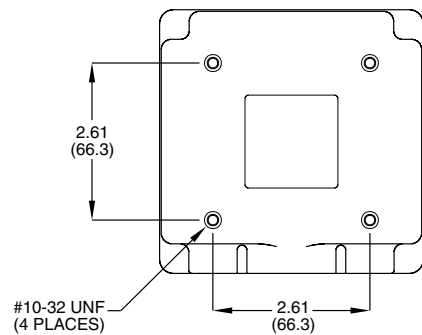
PIPE MOUNT
(VERTICAL/HORIZONTAL)



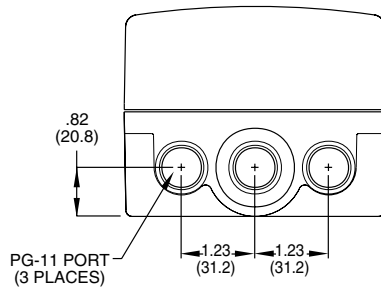
SIDE VIEW



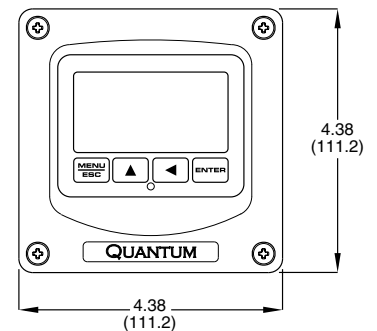
BOTTOM VIEW



BACK VIEW



BOTTOM VIEW
(RELAY VERSION)



FRONT VIEW

Performance Specifications

Q45P

Q45R

Displayed Parameters	Main input, 0 to 14 pH Sensor voltage, ± 500 mV Loop current, 4.00 to 20.00 mA Sensor temperature, -10 to 110° C (14 to 230° F)	Main input, -1000 to +2000 mV Loop current, 4.00 to 20.00 mA Sensor temperature, -10° to 110° C (14 to 230° F)
Main Parameter Range	0 to 14.00 pH	-1000 to +2000 mV
Input Impedance	Greater than 10^{13} Ohms	Greater than 10^{13} Ohms
Repeatability	0.1% of span or better	0.1% of span or better
Sensitivity	0.05% of span	0.05% of span
Non-Linearity	0.1% of span	0.1% of span
Stability	0.05% of span per 24 hours, non-cumulative	0.05% of span per 24 hours, non-cumulative
Temperature Drift	Span or zero, 0.02% of span/° C	Span or zero, 0.02% of span/° C
Warm-Up Time	7 seconds to rated performance	7 seconds to rated performance
Instrument Response Time	6 seconds to 90% of step input at lowest setting	6 seconds to 90% of step input at lowest setting
Max. Sensor-to-Analyzer Distance	3000 feet (914 meters) w/preamp, 30 feet (9.1 meters) w/o preamp	3000 feet (914 meters) w/preamp, 30 feet (9.1 meters) w/o preamp
Sensor Types	Quantum pH w/preamp - 5-wire input or combination style pH electrode w/TC - 2-wire input	Quantum ORP w/preamp - 5-wire input or combination style ORP electrode w/TC - 2-wire input

Q45P/Q45R Instrument Specifications (common to all variations)

Enclosure	NEMA 4X, IP66, polycarbonate, stainless steel hardware, weatherproof and corrosion resistant, (HWD): 4.4" (112 mm) x 4.4" (112 mm) x 3.5" (89 mm)
Mounting Options	Wall, panel, pipe, DIN rail, or integral-sensor (DC only)
Conduit Openings	Standard: 2-PG-9 openings, 1-1" NPT center opening, cordgrips and plug included Relay option: 3-PG-11 openings, plugs included
Weight	DC transmitter configuration: 1 lb. (0.45 kg) Line-powered unit: 1.5 lb. (0.68 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 secondary display, 0.3" (7.6 mm) 5 x 7 dot matrix characters
Keypad	4-key membrane type with tactile feedback, polycarbonate with UV coating, integral EMI/static shield and conductively coated window
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

Monitor/Analyzer Ordering Information

	Parameter	Reserved	Control	Power	Housing	Approval	Tags
Q45	P	N					
	P pH	Reserved	N None 2 2 Electromechanical Relays 3 2 Solid-State Relays, AC 4 2 Solid-State Relays, DC	S Loop P Portable L Portable w/ Data Logger A 115 VAC B 230 VAC	S Standard P Panel Mount, 115 x 115 mm Q Panel Mount, 1/2 DIN	N None 1 CSA	N None 1 316SS

	Parameter	Reserved	Control	Power	Housing	Approval	Tags
Q45	R	N					
	R ORP	Reserved	N None 2 2 Electromechanical Relays 3 2 Solid-State Relays, AC 4 2 Solid-State Relays, DC	S Loop P Portable L Portable w/ Data Logger A 115 VAC B 230 VAC	S Standard P Panel Mount, 115 x 115 mm Q Panel Mount, 1/2 DIN	N None 1 CSA	N None 1 316SS

Sensor Ordering Information

	Electrode Type	Reserved	Reserved	Body Material	Mounting Style	Cable Leads	Cable Length
Q25		N	N				
	P1 Standard pH glass (industrial) P2 Low Ω pH glass (municipal)	Reserved	Reserved	1 PEEK® 2 316SS	1 Convertible 2 Insertion 3 Sanitary, 1 1/2" 4 Sanitary, 2"	1 Stripped (standard)	1 15' 2 30' 9 Special

	Electrode Type	Reserved	Reserved	Body Material	Mounting Style	Cable Leads	Cable Length
Q25		N	N				
	R1 Platinum (standard) R2 Gold	Reserved	Reserved	1 PEEK® 2 316SS	1 Convertible 2 Insertion 3 Sanitary, 1 1/2" 4 Sanitary, 2"	1 Stripped (standard)	1 15' 2 30' 9 Special

Q25 Sensor Warranty

In addition to a standard one-year quality warranty, ATI unconditionally warrants to the ultimate purchaser **for a period of thirty months from date of shipment from our factory, that any Q25 series sensor may be replaced, FOR ANY REASON, at 50% off the current list price.** This warranty applies to normal sensor wear, as well as accidental damage.

Accessories

07-0100	NEMA 4X junction box	09-0034	pH 4.00 buffer, 1000 mL
31-0057	Sensor interconnect cable per foot (custom, double-shielded, six-wire)	09-0035	pH 7.00 buffer, 1000 mL
09-0042	200 mV ORP solution, 500 mL	09-0045	pH 6.87 buffer, 500 mL
09-0043	600 mV ORP solution, 500 mL	09-0036	pH 10.00 buffer, 1000 mL
05-0056	Quinhydrone powder, 5 grams	09-0037	pH 9.18 buffer, 500 mL
		05-0057	pH/ORP sensor regeneration kit



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