

# Water Quality Monitor

## Q22 pH ORP Sensors

### OVERVIEW

The Q22 specialty pH/ORP sensors are designed for use with all non-Badger Meter analyzer systems and generic panel meters, allowing these end users to utilize the same robust features of the standard Badger Meter Q25 sensors. The sensors are classified as either universal or loop-powered, depending on the output selected.

The universal sensors emulate standard, non-amplified combination sensors and are designed to interface with all non-Badger Meter pH/ORP analyzers. The sensors require no power supply as the preamplifier is powered by an internal lithium battery.

The pH sensor outputs an mV signal in the range of either -500...500 mV or 0...2V DC. Both are linear over the 0...14 pH range. The ORP sensor outputs an mV signal that ranges from -1000...1000 mV. These sensors may be used as replacement sensors for use with all non-Quantum analyzers.

The loop-powered sensors require an external 7...30V DC power supply and provide a 4...20 mA output signal for direct connection to generic panel meters, data acquisition systems or other devices that accept a current input. The sensor includes integral temperature compensation of the pH signal, so no temperature output is provided.

The sensor output is uncalibrated, therefore, the receiving instrument must be capable of providing user calibration of the pH or ORP signal on a periodic basis.

### 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 or ORP sensors.
- **PEEK or 316 SS Sensor Body Construction.** All sensor housings are constructed of either PEEK, a high performance thermoplastic that provides outstanding mechanical strength and chemical resistance, or 316 stainless steel.
- **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.
- **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.



- **Multiple Electrode Types.** Sensor electrodes are userspecified to ensure measurement reliability and maximum sensor lifetime. The type of pH electrode can be selected for optimal performance. The metal ORP electrode is either platinum or gold, depending on the process chemicals.

### SPECIFICATIONS

#### Q22 Sensor

|                                        |                                                                                                                                         |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| <b>Measuring Range</b>                 | 0...14 pH; 0...1000 mV or $\pm 1000$ mV                                                                                                 |
| <b>Sensitivity</b>                     | 0.002 pH; 0.2 mV                                                                                                                        |
| <b>Stability</b>                       | 0.02 pH; 2 mV (per 24 hours, non-cumulative)                                                                                            |
| <b>Wetted Materials</b>                | PEEK, ceramic, titanium, glass, Viton®, EDPM<br>Platinum or Gold: ORP,<br>316 stainless steel with sanitary or insertion<br>body styles |
| <b>Temperature Compensation</b>        | PT100 or PT1000 RTD                                                                                                                     |
| <b>Sensor Cable</b>                    | 6 conductor plus 2 shields, HDPE jacket                                                                                                 |
| <b>Temperature Range</b>               | 23...203° F (-5...95° C)                                                                                                                |
| <b>Pressure Range</b>                  | 0 ...100 psig                                                                                                                           |
| <b>Max Flow Rate</b>                   | 10 ft (3 m) per second                                                                                                                  |
| <b>Max Sensor to Analyzer Distance</b> | 3000 ft (914 m): universal<br>1000 ft (305 m): loop powered                                                                             |
| <b>Sensor Body Options</b>             | 1 in. NPT convertible<br>1-1/4 in. insertion<br>1-1/2 or 2 in. sanitary-style                                                           |
| <b>Shipping Weight</b>                 | 1 lb (0.45 kg)                                                                                                                          |

## ORDERING INFORMATION

### Q22-A-B-C-D-E Sensor

| Suffix A - Electrode Type                   |                                 |
|---------------------------------------------|---------------------------------|
| P1                                          | pH: Industrial glass            |
| P2                                          | pH: Municipal glass             |
| R1                                          | ORP: Platinum metal             |
| R2                                          | ORP: Gold metal                 |
| Suffix B - Temperature Compensation Element |                                 |
| 1                                           | Integral                        |
| 2                                           | PT1000                          |
| 3                                           | PT100                           |
| Suffix C- Output                            |                                 |
| 1                                           | ±500 mV (pH); 0...1000 mV (ORP) |
| 2                                           | 0...2V DC                       |
| 3                                           | 4...20 mA                       |

| Suffix D - Sensor Style           |                                              |
|-----------------------------------|----------------------------------------------|
| 1                                 | Convertible-style, PEEK                      |
| 2                                 | Insertion-style, 316 SS                      |
| 3                                 | 1-1/2 in. sanitary-style, 316 SS             |
| 4                                 | 2 in. sanitary-style, 316 SS                 |
| 5                                 | Convertible with quick-disconnect receptacle |
| Suffix E - Sensor or Cable Length |                                              |
| 1                                 | 15 ft (4.6 m)                                |
| 2                                 | 30 ft (9 m)                                  |
| 3                                 | 60 ft (18 m)                                 |

**NOTE:** Sensor lengths over 60 feet require a Junction box to be used to obtain desired length, up to max sensor distance to analyzer length, as listed in the *"Specifications"* on page 1.

### Options

|         |                                      |
|---------|--------------------------------------|
| 05-0057 | Sensor regeneration kit (P1, R1, R2) |
| 05-0067 | Sensor regeneration kit (P2)         |
| 09-0034 | pH 4.00 buffer, 1000 mL              |
| 09-0035 | pH 7.00 buffer, 1000 mL              |
| 09-0036 | pH 10.00 buffer, 1000 mL             |
| 09-0042 | 200 mV solution, 500 mL              |
| 09-0043 | 600 mV solution, 500 mL              |
| 05-0056 | Quinhydrone powder, 5 grams          |
| 05-0060 | Saltbridge for P1/R1/R2 sensors      |
| 07-0100 | NEMA 4X junction box                 |
| 31-0057 | Sensor interconnect cable            |

### NOTES:

1. Insertion and sanitary styles must use 316 SS body material and are only available in those sensor styles.
2. Sensor with integral connector is not waterproof and is for indoor use only.
3. Suffix D-5 requires sensor cable PN: 03-0029.