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Signet pH/ORP Buffer Solutions



Features

- **NIST traceable**
- **Easily identifiable color coded buffer solutions**
- **Liquid or powder versions**
- **Temperature compensated values**
- **Kits for easy use**

The Signet pH buffers are ideal for many calibration requirements. The liquid solutions are conveniently packaged in one pint bottles; the powder pillows are packaged in low weight, single-use containers which can be mixed with water. All pH buffers are color coded for easy identification; 4.01 pH is red, 7.00 pH is yellow, and 10.00 pH is blue.

The pH buffers are traceable to NIST standards and certificates are available upon request. They are accurate to within ±0.01 pH units @ 25 °C and have long term stability.

These solutions are temperature sensitive and are provided with temperature correction values for the most accurate calibration. For applications that require ORP calibration, the pH 4 and pH 7 buffers can be mixed with quinhydrone powder for the correct measurement values of +264 mV and +87 mV respectively.

Calibration Tips

1. The pH and ORP solutions can be used for calibrating more than one sensor within a day. However, the solutions must remain free of debris and must not be diluted by rinse water from previous calibrations.
2. ORP solutions made with quinhydrone are very unstable and may not read properly once exposed to air for a prolonged time. These solutions must be disposed of within an hour.
3. All other calibration solutions must be disposed of at the end of one day. Proper disposal is simply done by running tap water while pouring the used solutions slowly down the drain or per local requirements.
4. Use tap or deionized water to rinse the solutions off of the sensors.

System Overview

Panel or Pipe, Tank, Wall Mount	4 to 20 mA Output	Automation System
Signet Instruments 9900 or 8900 with 2751 Smart Sensor Electronics	2751 Smart Sensor Electronics with Customer Supplied Chart Recorder Programmable Logic Controller or Programmable Automation Controller	2751 Smart Sensor Electronics with 0486 Profibus Concentrator and Customer Supplied Programmable Logic Controller or Programmable Automation Controller



Signet Electrodes and Sensors
2724-2726
2734-2736
2774-2776
3719



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Buffer Kit



Buffer Solution



Quinhydrone

All sold separately

Understanding pH and ORP Calibration

Why do electrodes need to be calibrated?
Calibration ensures the pH or ORP electrode continues to function properly and accurately. pH and ORP electrode readings vary over time due to changes in reference voltage or aging of the pH glass. pH electrode output decreases with age, coating, elevated temperatures and pH glass erosion (by abrasion, and strong sodium hydroxide (NaOH), potassium hydroxide (KOH) or hydrofluoric acid (HF) solutions).

Calibration helps to identify when the electrode is worn out and needs to be replaced.

How often should an electrode be calibrated?

• **New applications** Weekly calibration is recommended for a new process where a pH or ORP electrode has never been installed. If the electrode calibrates within acceptable limits* over the next few weeks, change the calibration schedule to once every two weeks and continue to extend the schedule to meet your needs.

• **Existing applications** It is recommended the electrode be calibrated at least every month to ensure proper function* of the electrode.

• **Critical applications** In locations where measurement accuracy is extremely critical, the electrode should be calibrated as frequently as required for proper performance*.

• **Dirty applications** In applications where the electrode needs frequent cleaning, the electrode should be calibrated after each cleaning to ensure proper functionality*.

Why do some electrodes need frequent calibration while others need calibration every month?

If a process plant has a variety of processes within the facility, a calibration schedule needs to be determined for sensors placed in each type of process liquid.

- Clean applications, like drinking water, are rarely a problem for pH or ORP measurements and calibration is typically required every month.
- If the process solution contains high concentrations of chemicals, elevated temperature and/or pressure, or has many suspended solids, it is common to calibrate once every one or two weeks.
- For dirty process liquid applications, an electrode should be cleaned before calibrating.

What calibration solutions should be used?

pH calibration:
- Two pH buffer solutions should be used and need to be at least 3 pH units apart
- Use pH 7.00 and pH 4.01 solutions if the normal measurement value is less than 7 pH
- Use pH 10 and pH 7 if the normal measurement value is greater than 7 pH

ORP two point calibration:
- ORP calibrations are performed similar to pH calibrations using one or two solutions at different values.
- A pH 4 buffer solution saturated with quinhydrone will generate $^{+}$264 mV while a pH 7 buffer saturated with quinhydrone will generate $^{+}$87 mV.

Note: Quinhydrone solutions will last only for a short time (one hour or less). Also note that Signet EasyCal function only works with these two values.

* Sensors are good when a new electrode reads very close to the theoretical value (±0.25 pH). A used pH electrode may read as far off as ±0.84 pH before it needs to be replaced. If the pH readings in all buffers have shifted greater than 0.84 pH units (for example, electrode is reading 4.85 in a 4 buffer and 7.85 in a 7 buffer) or if the millivolt offset for pH/ORP sensors is extreme (outside of ±50 mV) in both pH/ORP solutions), a problem with the reference electrode is indicated and the electrode should be replaced.

Ordering Information

Mfr. Part No.	Code	Description
3-2700.395	**159 001 605**	Calibration kit; includes 3 polypropylene cups, box used as cup stand, 1 pint pH 4.01, 1 pint pH 7.00
3822-7115	**159 001 606**	20 gram bottle quinhydrone for ORP calibration
3822-7004	**159 001 581**	*pH 4.01 buffer solution, 1 pint (473 ml) bottle
3822-7007	**159 001 582**	*pH 7.00 buffer solution, 1 pint (473 ml) bottle
3822-7010	**159 001 583**	*pH 10.00 buffer solution, 1 pint (473 ml) bottle
3-0700.390	**198 864 403**	*pH buffer kit (1 each 4, 7, 10 pH buffer in powder form, makes 50 ml of each)
Special Request		NIST Traceable Certificate (liquids only)

* Safety Data Sheets (SDS) are available online at www.gfsignet.com

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