

# Instruction Sheet



## Model PH97 pH Sensor

**YOKOGAWA** ◆

Yokogawa Corporation of America  
2 Dart Road, Newnan, GA 30265

Tel.: 770-254-0400 Fax.: 770-251-6427

Doc. Nr. L2530

### PREPARATION FOR USE:

1. Remove storage boot containing the storage solution (3.8M KCl) by unwinding the black sealing tape from the sensor housing.

#### NOTE:

DO NOT remove the wetted fiber pack from inside the storage boot.

2. Save the storage boot with fiber pack for future use as a storage container and bulb protector when sensor is not in service. Be certain to use 3 to 4 M KCl as the storage solution. Seal boot to sensor with black electrician's tape using 3 to 5 complete wraps.

3. For first-time use after removing the storage boot: Inspect the sensor for any signs of breakage or shipping damage and commence with Calibration Procedures.

4. For sensors with replaceable o-ring seals: All o-rings require proper lubrication. We recommend use of PARKER O LUBE or equal for this purpose. Follow the instructions provided with lubricant. For best results we recommend that all o-rings be replaced whenever sensor is removed for service or inspection.

#### CAUTION:

The Model PH97/DP pH sensor is designed for use only with the Model PH87 retractable assembly. Please refer to the Model PH87 retractable assembly installation manuals for complete assembly, installation, and service instructions.

#### CALIBRATION PROCEDURE:

Refer to the specific instructions for pH sensor calibration described in the instruction manual provided with the EXA pH analyzer. These instructions will include procedures for automatic and/or manual calibration.

For best results it is recommended to perform a two-point pH calibration

using NIST primary buffers.

#### Recommended Two-Point Calibration:

Rinse the probe thoroughly with DI water to remove all traces of storage solution, process medium or previous test solution to prevent "carry over" contamination of the pH buffer solutions. Thoroughly rinse the probe with DI water after *each* buffer test.

#### NOTES:

- Always use "fresh" pH buffer solutions for best results.
- pH buffer solutions above 7.0 pH are less stable and have a very limited life. These high pH buffers will more readily absorb CO<sub>2</sub> from the atmosphere and will typically change to a *lower* pH value when left open.
- Keep in mind the "older" a sensor becomes, it will exhibit slower response times and will become less efficient in terms of its ability to span several pH units with the same repeatability.

#### CLEANING A MODEL PH 97/DP WITH IMPAIRED RESPONSE:

Used pH sensors which are physically intact can sometimes be restored to an improved level of performance. All pH sensors have a given useful life span depending on the conditions of use. One of the following procedures may prove helpful in restoring a used pH sensor.

1. **Initial Cleaning:** Wash with a solution of liquid detergent or enzyme detergent and warm water by gently scrubbing with a soft toothbrush or soft tissue. Follow with thorough rinse in DI or clean tap water.

2. **Inorganic Scale Deposits:** Dissolve the deposit by immersion of the sensor's measurement tip in dilute hydrochloric acid for a few minutes. Repeat step #1 above.

3. **Organic Oil or Grease Films:** Perform initial cleaning procedure. If film is known to be soluble in a particular organic solvent, wash with this solvent. Repeat step #1 above. Depending on the extent of the oil or grease contamination, it's possible that the liquid junction may be damaged beyond recovery. Soak in 3 to 4M KCl solution for a minimum of 30 minutes before recalibration and returning sensor to service.

4. **Plugged or Dry Liquid Junction:** Remove any observed contaminant with one of the above procedures, then soak in 3 to 4M KCl solution for a minimum of 30 minutes.

#### NOTES:

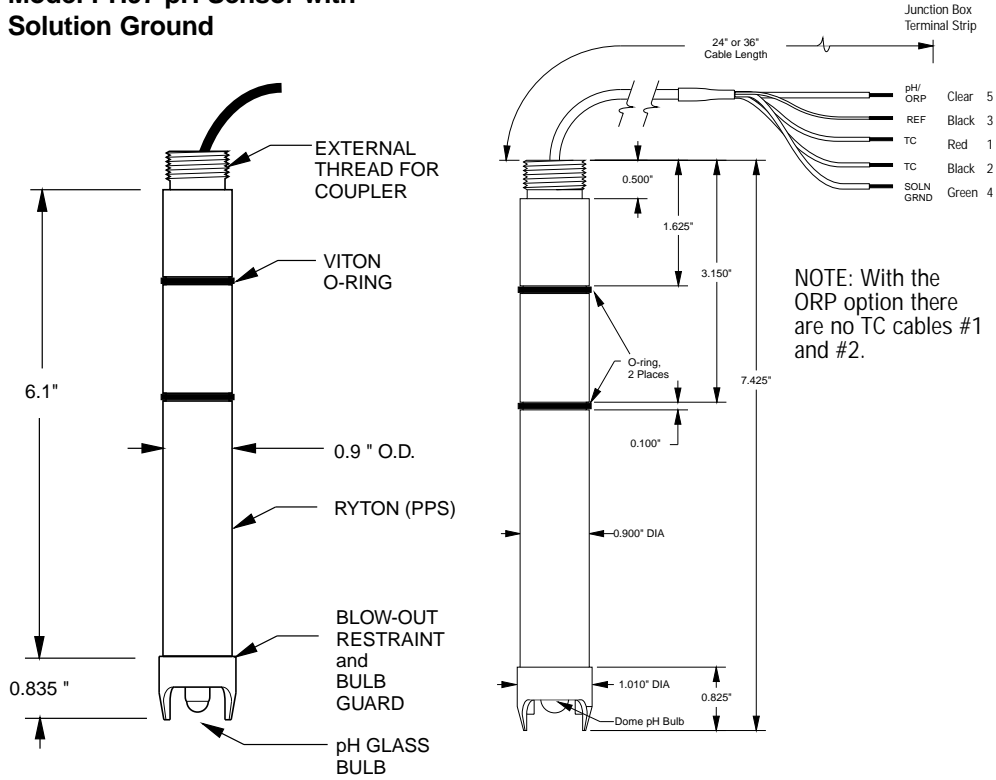
- Never permit the pH sensor to dehydrate or dry-out. Always keep it in a wetted environment especially when not in service.
- Cracked or broken sensors are not repairable.
- Inspect cable and connector to ensure that the insulation integrity is intact and that there are no signs of corrosion or contaminants on the metal components.

#### STORAGE:

1. **Short Term:** Immerse sensor measurement tip and liquid junction surface areas in 3 to 4M KCl. If this solution is not available, use 4.01 pH buffer, clean tap water, or lastly, a sample of the process being measured to keep the sensor hydrated.

2. **Long Term:** Fill storage boot that the sensor was originally shipped in with a freshly prepared 3 to 4M KCl solution and insert sensor. Seal boot to sensor with black electrician's tape using 3 to 5 complete wraps. The sensor should be stored in an upright (vertical) position.

## Model PH97 pH Sensor with Solution Ground



### Specifications:

|                           |  |
|---------------------------|--|
| pH Range:                 | 0-14 pH  |
| ORP range                 | -5000 mV to 5000 mV (requires/ORP option which replaces pH bulb) |
| Temperature range:        | 0-221°F (0-105°C)  |
| Maximum pressure:         | 100 psig @ 212°F (100°C)   |
| Maximum flow:             | 10 feet per second (3 meters per second)                         |
| Reference electrode:      | Ag/AgCl  |
| Temperature compensation: | Pt1000   |

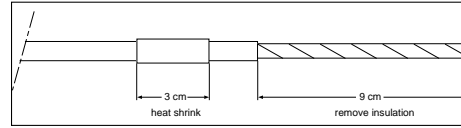
### Wetted materials:

|                        |  |
|------------------------|--|
| Probe Sheath:          | Titanium   |
| Compression Fitting:   | 316L SS<br>Titanium (optional)   |
| Body and Sensor guard: | Ryton (PPS)  |
| O-rings:               | Viton  |
| Liquid junction:       | Porous Teflon  |
| Dome pH bulb:          | Glass<br>Platinum (/ORP option)  |
| Standard cable length: | pH97-07 24" (terminated in J-box)<br>pH97-21 36" (terminated in J-box) |

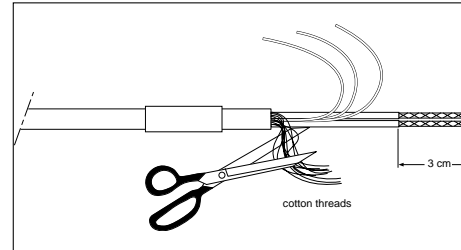
Extension cable may be purchased in bulk quantities. In the case of bulk quantities, cut to length, then terminate the cable as shown below:

### Termination procedures for WF10 cable

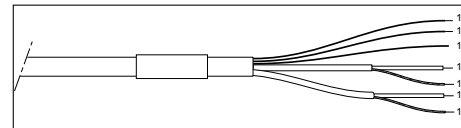
- Slide 3 cm of the heat shrink tube (9 x 1.5) over the end of the cable to be terminated.
- Strip 9 cm of the outer (black) insulating materials, taking care not to cut or damage internal cores.



- Remove loose copper screening and cut the cotton packing threads as short as possible.
- Strip insulation from the last 3 cm of the brown and the white coaxial cores.



- Extract the coaxial cores from the braid, and trim the black (low-noise) screening material as short as possible.
- Insulate the overall screen and the 2 coaxial screens with suitable plastic tubing.
- Strip and terminate all ends with suitable (crimp) terminals and identify with numbers as shown.



- Finally, shrink the heat shrink tube into position.

Use WF10 extension cable from the junction box to the analyzer or transmitter. Do not exceed 30 meters (100 ft) between the sensor and the analyzer/transmitter.

Connect WF10 cables 11-15 to junction box terminals 1-5, respectively. Cables 16 and 17 of the extension cable are NOT connected at the junction box, and should be terminated and taped. Connect cables 11-17 to the appropriately labeled terminals in the analyzer.

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**YOKOGAWA CORPORATION OF AMERICA**  
2 Dart Road  
Newnan, GA 30265-1040  
Tel. 770-254-0400  
Fax. 770-251-6427  
www.yca.com

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