



## Instructions for the Use of ORP Electrodes

This ORP electrode is a hand crafted, precision analytical device. Carefully follow the directions in this instruction sheet to obtain the best performance and electrode life.

### Required Equipment and Solutions

- pH/mV meter
- pH buffer 4.01 saturated with quinhydrone
- pH buffer 7.00 saturated with quinhydrone
- Wash bottle filled with distilled or de-ionized water
- Lab wipes
- Laboratory magnetic stirrer and magnetic stir bars
- Clean breakers

### Preparation of the Electrode

Mono ORP electrodes are shipped dry with a rubber boot covering the tip of the electrode to protect the sensing element.

Combination ORP electrodes are shipped with a storage bottle or protective boot covering the electrode tip. The bottle or the boot contains a foam or a cotton ball moist with DI water.

Remove the bottle or the boot from the electrode and thoroughly rinse the electrode with distilled water. Wipe carefully with a clean lab wipe.

For refillable combination ORP models, uncover the filling port to expose the electrode reference chamber fill hole (for sealed, gel filled electrodes, disregard this operation). Fill the reference chamber with reference filling solution. Use the appropriate reference filling solution. Electrodes that have been filled with the incorrect filling solution are not covered under warranty.

### Reference Filling Solution Selection:

- For ORP combination electrodes with Calomel and Double Junction Ag/AgCl reference half cells, use 4 M KCl reference filling solution.
- For ORP combination electrodes with Single Junction Ag/AgCl reference half cells, use 4 M KCl saturated with AgCl reference filling solution.

### Checking Electrode Operation

1. Connect the ORP electrode to the input connector on the pH/mV meter. Ensure the electrode connection is secure.
2. Place the electrode into a beaker containing quinhydrone saturated pH 7.00 buffer. Stir gently. The mV reading  $E_1$  should be  $86 \pm 20$  mV.

1. the electrode before use.
2. If the electrode has been exposed to protein or similar materials, soak in acidic pepsin, The part number CS 0003 for 5 minutes. Rinse thoroughly with distilled water. Recalibrate before use.
3. If the previous cleaning procedures fail to restore response, soak the electrode in 0.1 N HCl for 30 minutes. Rinse thoroughly with distilled water. Recalibrate before use.
4. If electrode response is not restored still, replace the electrode.

3. Remove the electrode from the buffer. Rinse with distilled water and blot with a lab wipe.

4. Place the electrode into a beaker containing quinhydrone saturated pH 4.01 buffer. Stir gently. Record the mV reading.

The difference between  $E_2$  and  $E_1$ , ( $E_2 - E_1$ ), should be  $175 \pm 20$  mV.

### Reading a Sample with the Electrode

1. Rinse the electrode with distilled water and blot with a lab wipe. Place the electrode in a beaker containing the sample and a stir bar. Stir as before. Record the mV reading when the reading is stable.

2. Remove the electrode from the sample, rinse the electrode with distilled water over the "waste" beaker. Blot the electrode dry with a lab wipe. The electrode is now ready to read the ORP readings of other samples.

### Storing the Electrode

Mono ORP electrodes should be stored dry. Combination ORP electrodes should always remain moist.

When storing for long periods, store the electrode in the storage bottle or boot which came with the electrode. Ensure that the foam or cotton ball remains moist with distilled water.

### Electrode Cleaning

Contamination of the sensing element often results in slow response and inaccurate readings. Clean the element by one of the following procedures:

1. Inorganic Deposits: Immerse electrode tip in 0.1 HCl for 10 minutes. Wash the tip with distilled water.
2. Organic Oil and Grease Films: Wash electrode tip in a liquid detergent and water.
3. After above treatment, soak the electrode tip in alcohol for 5 minutes, then, in quinhydrone saturated pH 4.01 for 15 minutes; rinse with distilled water afterwards.

**NOTE:** DO NOT ATTEMPT TO SAND OR POLISH THE SENSING ELEMENT WITH SAND PAPER OR OTHER POLISHING MATERIAL!

## **Laboratory Products Warranty**

This products designed and sold for use in laboratory applications are warranted to be free from defects in materials and workmanship for a period of six (6) months, provided that the product is used in accordance with the instructions provided and that the product has not been subjected to breakage, alteration, misuse, abuse or used in an application not normally intended for the product. In the event of a warranted failure within the warranty period, contact your representative during regular business hours, and ask for customer service.

Please be prepared to discuss the details of the difficulty. If necessary, a Return Authorization Number (RAN) will be issued. Materials or goods returned without an RAN will not be accepted. Return the product in freight prepaid.

The warranty described above is exclusive and in lieu of all other warranties whether statutory, express or implied including, but not limited to, any implied warranty of merchantability or fitness for a particular purpose and all warranties arising from the course of dealing or usage of trade. The buyer's sole and exclusive remedy is for repair or replacement of the non-conforming product or part thereof, but in no event shall dealers or agents of any tier be liable to the buyer or any person for any special, indirect, incidental or consequential damages whether the claims are based in contract in tort (including negligence) or otherwise with respect to or arising out of the product furnished hereunder.

No other representations of warranty made by any person, including dealers, employees or agents shall be binding unless made in writing and signed by an official.