ORP Electrode Calibration Kit
Using Quinhydrone

The performance of an ORP electrode can be determined by using the ORP Quinhydrone Kit and the procedures given below. The Quinhydrone Kit can be used for 30 calibrations and consists of the following items:

- 1 pint pH 4 buffer
- 1 pint pH 7 buffer
- 3 - 4 oz. Beakers
- 3 wood applicators
- 1 - 10 gram bottle Quinhydrone
- 1 instruction sheet

Instructions:

1. The buffer / Quinhydrone mixtures should be freshly made each time the ORP electrodes are calibrated. Do not store the mixtures or use after 2 hours as their values change with time.
2. Fill a beaker with de-ionized or distilled water to use for rinsing the electrode.
3. Fill a second beaker with pH 7 buffer to approximately ½ oz mark and label the beaker pH 7.
4. Add to this buffer enough Quinhydrone that stays on about ¼ inch long (6mm) of the wood applicator.
5. Use the wood applicator to stir the Quinhydrone into the buffer.
6. A small amount of Quinhydrone MUST remain undissolved; if all the Quinhydrone dissolves add a small amount and stir. Repeat as necessary until a small amount of Quinhydrone remains undissolved.
7. Fill a third beaker with pH 4 buffer to approximately ½ oz mark and label the beaker pH 4.
8. Add to this buffer enough Quinhydrone that stays on about ¼ inch long (6mm) on the wood applicator.
9. Use the wood applicator to stir the Quinhydrone into the buffer.
10. A small amount of Quinhydrone MUST remain undissolved; if all the Quinhydrone dissolves add a small amount and stir. Repeat as necessary until a small amount of Quinhydrone remains undissolved.
11. Rinse the ORP electrode and pat it dry with a soft tissue.
12. Put the electrode in the pH 7 mixture and stir the electrode gently.
13. Allow the reading to stabilize, this typically takes 30 to 60 seconds, and note the reading.
14. The reading should be within about ±15mV from the following values:

<table>
<thead>
<tr>
<th>Table 1: Readings In pH 7 Buffer / Quinhydrone Mixture</th>
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</thead>
<tbody>
<tr>
<td>Temperature:</td>
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<tr>
<td>Reading:</td>
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15. Rinse the ORP electrode and pat it dry with a soft tissue.
16. Put the electrode in the pH 4 mixture and stir the electrode gently.
17. Allow the reading to stabilize, this typically takes 30 to 60 seconds, and note the reading.
18. Add 170mV and 185mV to the reading from step 13. Write down the calculated values.

FOR EXAMPLE:
If the reading from step 13 is 90mV, then the calculated values should be
260mV = 90mV + 170mV and
275mV = 90mV+185mV.

19. The reading should be between the two calculated values from step 18.
20. With time and/or use, the value in the pH 7 mixture may change, however the reading from the pH 4 mixture must be within the two calculated values (step 18). If the reading is within the range, it means that the electrode has good span and should be able to be calibrated along with the meter to reflect the proper ORP potential.
21. If the reading (step 17) is less than the calculated value, pH 7 mixture value + 170mV (260mV), the electrode may be coated. Remove the coating using the following suggestions. If the reading is still less than the calculated value after cleaning, replace the electrode.
   - Wipe the surface clean with a soft cloth or tissue.
   - Soak the electrode in a chemical known to dissolve the suspected coating material.
   - Very gently polish the surface with a paper towel.
   - After cleaning, let the electrode soak in one of the calibrating solutions for about five minutes.
22. If the reading (step 17) is more than the calculated value, pH 7 mixture value + 185mV (275mV), replace the electrode.
23. Once the ORP electrode is verified and is in good working order put the electrode into the pH 7 mixture.
24. Follow the ORP meter calibration procedure to calibrate the ORP value to one of the values in Table 1.