For additional assistance, call our Customer Service Department at 1-(603) 668-0692.

For Faster Service When Calling!
Please have the following information available:
1. Model Number of the electrode (Ex. MI-800)
2. Serial Number (located on green sleeve on the electrode cable).
3. Millivolt readings of the electrode in pH 4 and pH 7 buffers or equivalent.

For additional information, including Custom-made Electrodes at reasonable prices with free technical support, please contact Microelectrodes, Inc.

Microelectrodes, Inc.
40 Harvey Road
Bedford, NH 03110-6805 USA
Tel 1-(603)-668-0692  Fax 1-(603)-668-7926

ORP
MI-800-XXX
Operating Instructions
For all Micro-Redox Electrodes

Only from
The People At
Microelectrodes, Inc.

Call or Email Today
for More Information!

Microelectrodes, Inc.
40 Harvey Road
Bedford, NH 03110-6805 USA
Tel 1-(603)-668-0692  Fax 1-(603)-668-7926

Website: www.Microelectrodes.com
Email: Info@Microelectrodes.com
MI-800-XXX Micro ORP (Redox) Series Electrodes
Operating Instructions

Use of the Electrode

A. Combination Electrodes
All of the MI-800-XXX Series combination electrodes are ready to use. Carefully unwind the tape and remove the probe from the protective glass tube. The clear sleeve which covers the fill hole should be moved down the glass barrel slightly to ventilate the reference chamber and replaced after use.

Use of separate Reference Electrode is not required

B. Single Electrodes
All of the MI-800-XXX Series single electrodes are ready to use. Carefully unwind the tape and remove the probe from the protective glass tube (if applicable).

Use of separate Reference Electrode is required

Calibration
Since ORP is a characteristic measure of redox equilibrium, it should not require standardization or calibration. However, it is desirable to check the electrode for proper operation and electrode poisoning. Solutions of known potential can be made by saturating pH buffers with quinhydrone using the following procedure:

1. Place 20 ml of pH 4 buffer into one beaker and 20 ml of pH 7 buffer into a second beaker. Saturate each buffer with quinhydrone. Quinhydrone is not readily soluble in the buffers so a few crystals stirred into the buffer is sufficient. The resultant solution will be amber colored. Saturated quinhydrone buffers need to be made up fresh each time the electrode is to be checked.

2. Place the tip of the MI-800-XXX Series ORP electrode (with an appropriate reference electrode, such as our MI-401/MI-402, if it is not a combination electrode) into the first beaker containing the quinhydrone and buffer solution. Record the millivolt reading and the temperature of the solution.

3. Rinse the electrode with distilled water and place it into the second beaker. Record the millivolt reading and the temperature of the solution.

4. The measured potentials will generally be within 10 mV of the theoretical values listed below.

<table>
<thead>
<tr>
<th>Reference Type</th>
<th>Ag/AgCl</th>
<th>Calomel</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Temp (°C)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>+268</td>
<td>+218</td>
</tr>
<tr>
<td>25</td>
<td>+263</td>
<td>+213</td>
</tr>
<tr>
<td>30</td>
<td>+258</td>
<td>+213</td>
</tr>
</tbody>
</table>

Handling, Cleaning, and Storing the Electrode

Handling (for Combination Electrodes): When necessary, the outer reference chamber of the electrode can be refilled using the 3M KCL dispensing bottle and Bulb Pipette provided with the probe. Fill the pipette with the 3M KCl Reference Electrolyte. Hold the electrode at a 60 degree angle (approx.) and slowly insert the tip of the pipette into the fill hole of the electrode.

Be careful not to apply pressure against the inner glass capillary tube.

Slowly fill the reference chamber. If filling is done too quickly, air may be trapped in the chamber, causing the reference solution to squirt out of the fill hole instead of entering and filling the reference chamber.

Cleaning: When using the electrode in solutions containing protein, the electrode should be soaked in an enzyme cleaning solution such as Terg-a-zyme, by Alconox Inc, or a chromic/sulfuric acid glass cleaning solution after each use for a few minutes to remove the protein from the glass and the reference junction. This will prolong the useful life of the electrode. Rinse thoroughly with distilled water.

Storing: Always clean the electrode before storing.
Long-term (over 2 weeks): Return the electrode to its original container and prepare it in the same condition in which you received it. For combination electrodes, this means moistening the sponge located in the bottom of the protective glass tube with distilled water.
Short-term: The electrode can be left in a 0.1M KCl solution.

Troubleshooting

A. Little or No Response (Combination)
Inspect the electrode for visible cracks (usually occurring around the tip of the electrode). If any exist, the electrode cannot be repaired and must be replaced. The slightest crack in or around the glass will cause the electrode to give similar readings in all solutions.

B. Response Pegs Off Scale (Combination)
1. Visually inspect the electrode for broken or dissolving internal elements or for inadequate volume of filling solution. Filling solution level should be above the internal elements.

2. Blocked or clogged liquid junction – soak the tip of the electrode in warm (50°C) distilled water for 5 to 10 minutes. If still clogged, soak overnight in distilled water.

C. Sluggish Response
If the electrode becomes sluggish in its response, clean the electrode in the manner described earlier.