SOP: Oakton PC 700 Bench Series pH/ Conductivity/°C/°F Meter

Approvals:

Preparer: Jason McMillan — Date 08JAN14
Reviewer: Dr. Margaret Bryans — Date 10JAN14

1. **Purpose:**
   1.1. To calibrate and operate the Oakton PC 700 Bench Series pH/ Conductivity/°C/°F Meter.
2. **Scope:**
   2.1. To measure the pH and conductivity of solutions and media.
3. **Responsibilities:**
   3.1. It is the responsibility of the course instructor/lab assistant to ensure that this SOP is performed as directed and to update the procedure when necessary.
   3.2. It is the responsibility of the students/technicians to follow the SOP as described and to inform the instructor about any deviations or problems that may occur while performing the procedure.
4. **References:**
   4.1. Oakton Bench 700 Series Quick Guide
   4.2. Oakton PC 700 Instruction Manual
5. **Definitions:** N/A
6. **Precautions:**
   6.1. Use caution when handling all samples due to unknown pH.
   6.2. Do not wipe or rub pH electrode. This will create a static build up that will interfere with measurements.
   6.3. Always wear the appropriate personal protective equipment (PPE).
7. **Materials:**
   7.1. Oakton PC 700 pH Meter and electrodes
   7.2. pH electrode storage solution
   7.3. commercially made pH standard buffers as required
   7.4. wash bottle
   7.5. MilliQ water
   7.6. waste beaker
   7.7. laboratory tissues, such as Kimwipes
   7.8. Oakton 1413 µS/cm Conductivity Standard
8. **Procedure:**
   8.1. **pH Preparation**
      8.1.1. Select the pH 7 standard buffer and a second standard (and third if needed) buffer that brackets the expected sample pH.
      8.1.2. Prepare buffers according to manufacturer's instructions if needed, and ensure that they are not expired.
   8.2. **pH Calibration**
      8.2.1. Press the power key to turn on the pH meter.
      8.2.2. Gently remove the protective cap/sleeve from the bottom of the pH electrode.
      8.2.3. Rinse the pH electrode with MilliQ water and gently blot dry with a laboratory tissue.

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8.2.4. Press the "MODE" key until "pH" is displayed on the right side of primary (top) reading.

8.2.5. Dip the pH electrode into the first pH buffer and press the "CAL/MEAS" key until "**CAL**" is displayed on the top of the LCD display. The secondary (bottom) reading will lock onto the appropriate buffer value. Provide stirring for best results. When the **READY** indicator appears in the top left portion of the LCD screen, press the "ENTER" key to accept. The primary reading will flash briefly before the secondary reading begins scrolling the remaining buffers available.

8.2.6. Rinse the pH electrode with MilliQ water, gently blot dry with a Kimwipe, and then dip the pH electrode into the second pH buffer. The secondary reading will lock onto the appropriate buffer value. When the READY indicator appears, press the "ENTER" key to accept. The primary reading will flash briefly and then display the percent efficiency (slope) before the secondary reading begins scrolling the remaining available buffers.

8.2.7. Press the "CAL/MEAS" key to return to measurement mode or to calibrate a third buffer repeat step 8.2.6.

8.2.8. Remove the pH electrode from the solution, rinse the pH electrode with MilliQ water and blot dry with a laboratory tissue.

8.2.9. Replace storage cap if immediate measurement of sample is not needed.

8.3. **pH Measurement**

8.3.1. If necessary, gently remove the protective cap/sleeve from the bottom of the pH electrode, rinse the pH electrode with MilliQ water and blot dry with laboratory tissue. Be sure **MEAS** is visible on the top left side of the LCD display

8.3.2. Insert pH electrode into the sample. Provide stirring.

8.3.3. Read pH value on the primary reading when the value has stabilized.

8.3.4. Remove the pH electrode from the solution, rinse the pH electrode with MilliQ water and blot dry with a laboratory tissue.

8.3.5. Repeat steps 8.3.2. through 8.3.4. for additional samples.

8.3.6. When finished, replace protective cap onto end of the pH electrode and turn off the pH meter by pressing the power key.

8.4. **Automatic Conductivity Calibration**

8.4.1. Press the "MODE" key as needed to select conductivity (µS or mS).

8.4.2. Dip the conductivity electrode into the selected conductivity standard beyond the upper steel band (utilize the fill line on the outside of the probe guard for reference) and press the "CAL/MEAS" key until "CAL" is visible on the LCD display. Provide stirring.

8.4.3. The primary reading will show the factory default value, while the secondary reading will lock on the appropriate automatic standard value from Table 1.

8.4.4. When the **READY** indicator appears, press the "ENTER/RANGE" key to accept. The primary reading will flash briefly before returning to measurement mode upon successful calibration.

8.5. **Conductivity Measurement**

8.5.1. Rinse the conductivity electrode with MilliQ water and gently blot dry with a

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laboratory tissue.

8.5.2. Dip the conductivity electrode into the sample beyond the upper steel band (utilize the fill line on the outside of the probe guard for reference).

8.5.3. Allow time for the reading to stabilize on the primary reading. **The clear yellow protective probe guard must be attached during measurement to prevent erroneous results.**

8.5.4. Rinse the conductivity electrode with MilliQ water and gently shake off any excess water droplets.

8.5.5. Turn off the pH/Conductivity meter by pressing the power key.

9. Attachments:

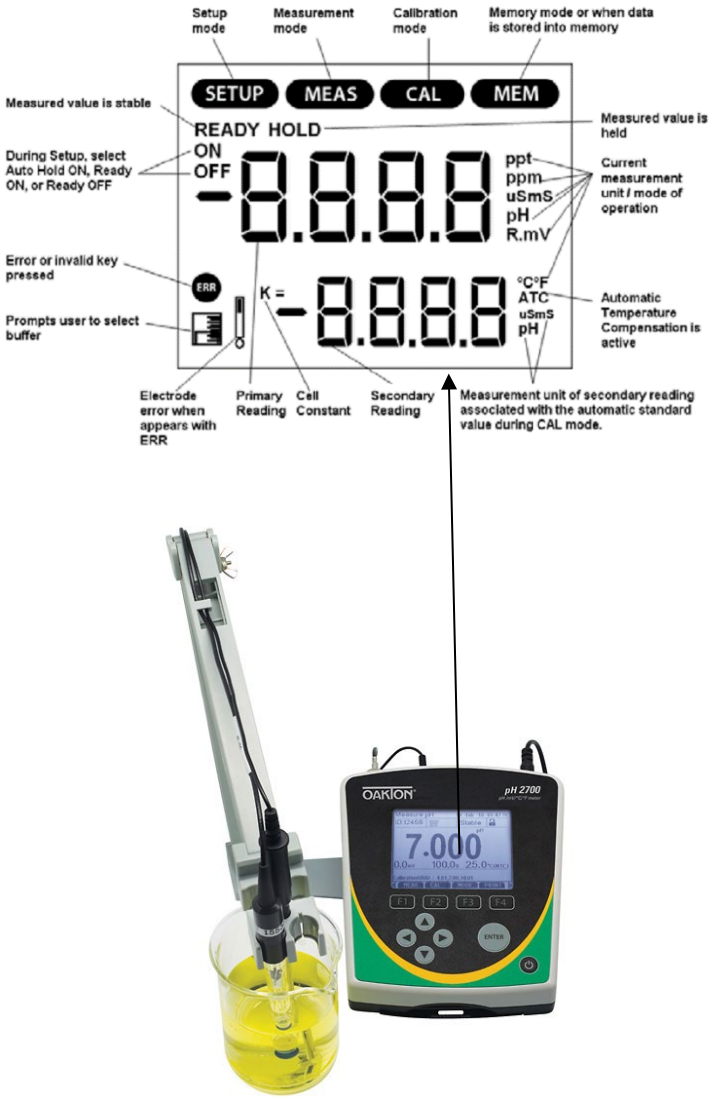

Figure 1: Oakton PC 700 LCD Annunciators
(http://static.coleparmer.com/large_images/35420_20a.jpg)

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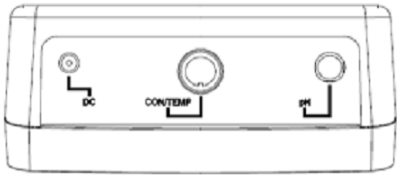

DC	Power supply
CON/ TEMP	8-pin DIN connection for 2-cell Con/TDS/Temp electrode
pH	BNC connection for pH, or ORP (Redox) electrode

Figure 2: Meter Connections
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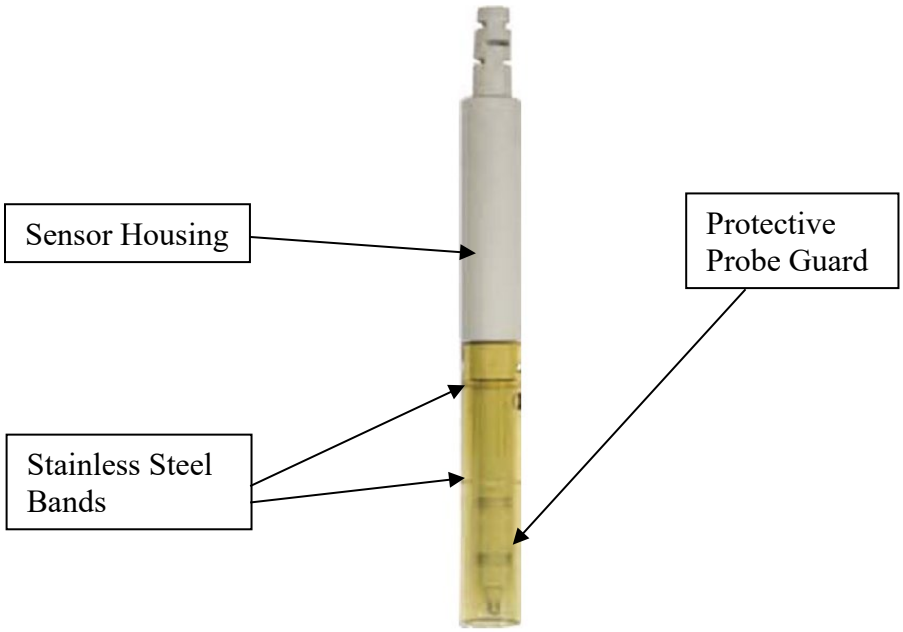

Figure 3: Conductivity Electrode
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Range #	Conductivity Range	Automatic Calibration Values	
		Normalization Temperature	
		25 °C	20 °C
r 1	0.00 – 20.00 µS	None	None
r 2	20.1 – 200.0 µS	84 µS	76 µS
r 3	201 – 2000 µS	1413 µS	1278 µS
r 4	2.01 – 20.00 mS	12.88 mS	11.67 mS
r 5	20.1 – 200.0 mS	111.8 mS	102.1 mS

Range #	TDS Range (using 0.5 TDS factor)	Automatic Calibration Values
r 1	0 – 10.00 ppm	none
r 2	10.1 – 100.0 ppm	none
r 3	101 – 1000 ppm	none
r 4	1.01 – 10.00 ppt	none
r 5	10.1 – 100 ppt	none

Table 1: Conductivity Calibration Standard values
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10. History:

Revision Number	*Effective Date*	*Preparer*	*Description of Change*
0	08JAN14	Jason McMillan	Initial release