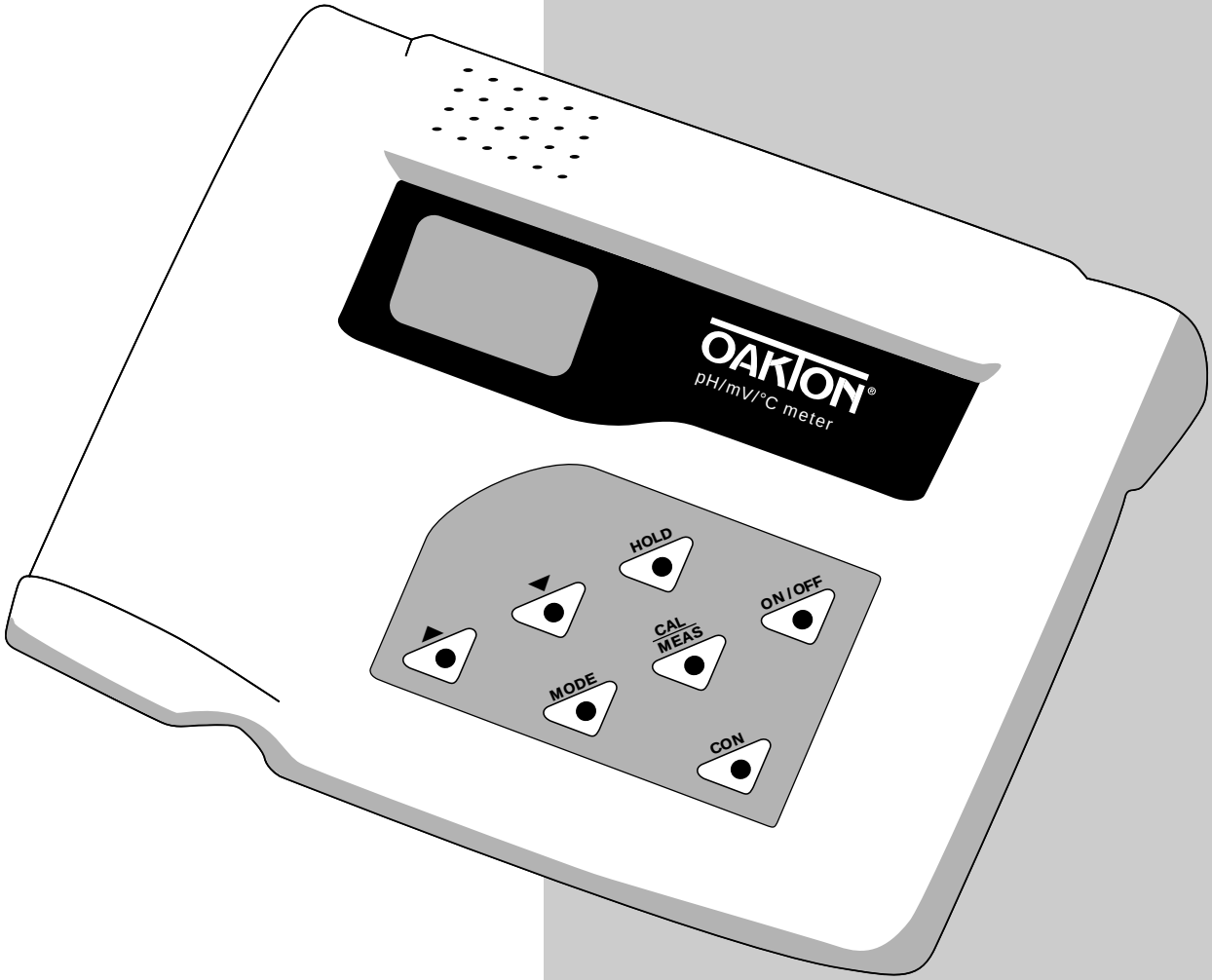
# The OAKTON® Economy pH/mV/°C Benchtop Meter




WD-35617-00
WD-35617-02
WD-35617-03
WD-35617-05
WD-35617-07
WD-35617-08

701-83

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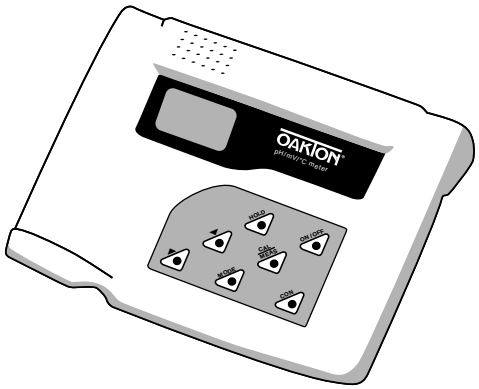
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*Quick tip*

let the mini table of contents in the outer margins of this manual guide you instantly to the right section




# 1. Introduction

Thank you for purchasing the OAKTON® WD-35617-series Benchtop meters. These meters are microprocessor controlled, user-friendly and reliable. The large customized LCD allows clear, easy operation. The display has mode annunciators for pH, temperature and mV readings. The secondary display shows the temperature readings simultaneously with the primary display.

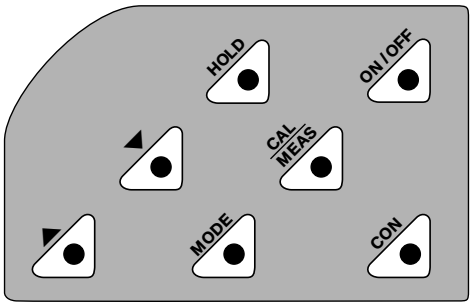



Figure 1

## Keypad

See Figure 1.

A large membrane keypad with touch feedback makes the meter easy to use. Names and symbols describe the function button controls.

| Key | Description |
|---|---|
| ON/OFF | Powers the meter ON/OFF. When the meter is switched on, it automatically starts in the pH measurement mode. |
| CAL/MEAS | Switches between the measurement and calibration modes of the meter. Skips some of the options in the hardware temperature calibration. |
| MODE | Switches between the different measurement modes pH/Temperature/mV. |
| ▲ | Selects the next higher pH buffer setting in the pH calibration mode. Also used to increase the temperature value displayed for temperature calibration. |
| ▼ | Selects the next lower pH buffer setting in the pH calibration mode. Also used to decrease the temperature value to the desired value for temperature calibration. |
| HOLD | Freezes a measurement on the display. Press again to get current readings. |
| CON | Confirms and enters the value selected for calibration. |

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## Rear Panel

See Figure 2.

The OAKTON® WD-35617-series meters provide a complete set of connectors for the various accessories commonly used. Listed in the table below are details of the connections that you can make.

| Connection | Function |
|---|---|
| ATC | Phono jack connection from the temperature probe for Automatic Temperature Compensation. |
| INPUT | For connection to sensor electrodes with BNC type connectors. The meter accepts any pH, ORP or ISE with BNC connector. Always make sure that the connector is clean and dry. |
| REF | For connection to pin type reference electrode normally used with half cell (mono) type pH electrodes or ISEs. |
| REC | For connection to strip chart recorders. Use subminiature plug with positive tip. |
| GND | For connection to the earth ground jack (standard tip connectors). |
| DC | For connection of the AC adapter power supply (included). |

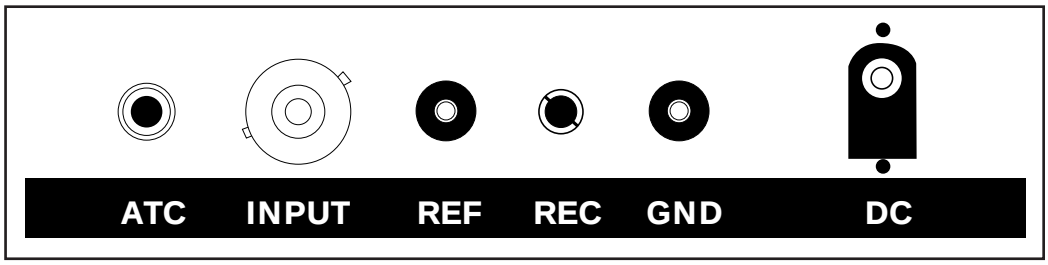



Figure 2

# 2. Starting Up

*Attention!*
*Do not get water on the BNC connector during operation. Avoid touching the connector with soiled or wet hands.*

Back panel connections
See Figure 3 .

1. **Connect the AC adapter** from an AC power source to the power jack (DC). Slide in the adapter jack of the A/C adapter into the meter until it is firmly seated. Voltage is set at 9V and the current is at 500 mA, (center positive connector).
2. **Connect a sensor electrode** to the BNC input connector (INPUT). The meter can accept any pH, ORP, or Ion Selective Electrode with a BNC connector. Make sure the connector is clean and dry. Slide the electrode connector of the electrode over the BNC connector socket. Make sure the slots of the connector are in line with the posts of the socket. Rotate and push the connector clockwise until it locks. For separate reference electrodes, push electrode pin into jack marked “REF”.
3. **Connect a temperature probe** to the input jack marked ATC. Insert the probe into the jack marked with ATC on the rear of the instrument panel.
4. **Connect your chart recorder** to the jack marked REC You can connect chart recorders or other external output devices such as transmitters. Plug in the sub miniature connector from the chart recorder into the jack marked with REC.

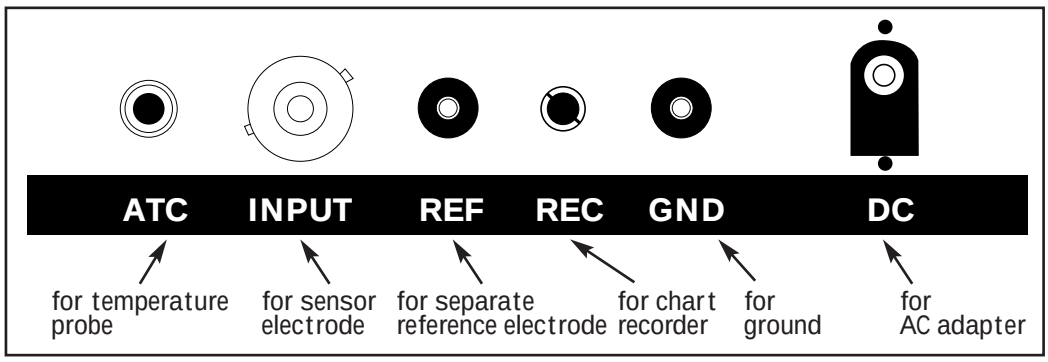


Figure 3

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# 3. pH calibration and measurement

NOTE: For ATC measurements, attach the probe to the meter. The ATC mode annunciator shows on the display. Insert the probe into the solution to be measured so that the sample temperature can be recorded and pH readings automatically temperature compensate. If manual temperature compensation is preferred, do not plug a temperature probe into the meter.

NOTE: If you choose to calibrate to 1 or 2 pH values, the older calibration values already stored by the meter will remain stored. These stored values may cause accuracy loss when your readings are close to the old stored calibration values. For best accuracy, do at least a two point calibration using fresh pH buffers (pH 4.01, 7.01, and/or 10.00). Select calibration buffers with calibration values closest to the measurement range you expect to work in. A three point calibration (at pH 4.01, 7.01, and 10.00) ensures maximum accuracy throughout the measurement range.

For quick checks with less accuracy, do a one point calibration. Select the buffer value closest to the measurement range you will work in.

DO NOT REUSE SOLUTIONS AFTER CALIBRATION.

Contaminants in the solution can affect the calibration, and eventually the accuracy of the measurements. All new calibrations will over-ride existing stored calibration data at these calibration points. The meter does not erase stored calibrations even when unplugged.


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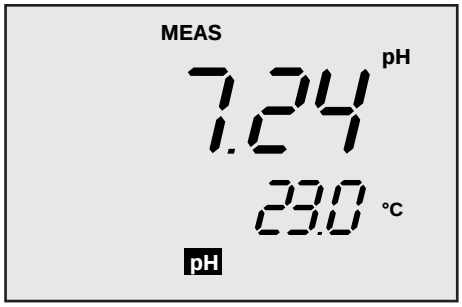


Figure 4

## pH calibration

Select pH 4, 7, or 10 buffers in pouches or bottles from the OAKTON standard buffer solutions.

NOTE: OAKTON Buffer solutions are supplied in recyclable shatterproof bottles of 1 pint.

1. Press the ON/OFF key.
   All the LCD segments display for a few seconds. The LCD switches to the pH measurement mode. See Figure 4 .
   The customized LCD display will indicate the following:

| Display | Remarks |
|---|---|
| MEAS | Measurement mode is selected. |
| pH | Unit of measurement |
| °C | Measured temperature reading |
| pH | pH mode is selected. |

## Calibration

### One Point pH Calibration

1. Make sure the meter is on and in the pH measurement mode. See Figure 4 above.
2. Rinse the electrode in deionized water. If using the ATC function with a separate temperature probe, rinse the temperature probe as well. **DO NOT WIPE THE pH OR TEMPERATURE PROBES DRY!** Wiping the probes causes static, and will create calibration and measurement instability.
3. Select the pH buffer and pour some into a CLEAN container.
4. Immerse the electrode and temperature probes 1/2 to 2 inches into the buffer.
5. Press CAL/MEAS to enter the calibration mode.
6. Use the up or down arrow keys to display the pH buffer value the electrodes are in (pH 4.01, 7.01, or 10.00).
7. When the READY indicator displays in the left hand corner, press the CON button. See figure 5.
   The calibration point is stored in the meter.
8. The display changes so the larger numbers correspond to the calibration buffer value at the temperature of the buffer, and the smaller display automatically changes to another buffer value.
9. If you are satisfied with the buffer reading from the larger numbers, press CAL/MEAS to return to the measurement mode and begin measurements. If the display changes more than a digit (0.01 pH) from the calibration value for the temperature you are calibrating at (referenced on the buffer labels), repeat the calibration.

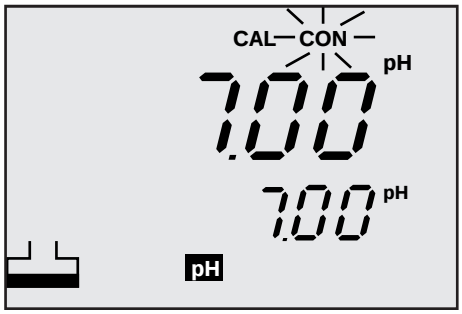


Figure 5

### Two or Three Point pH Calibration

1. Prepare the meter and electrode as in steps 1-5 at left. This time start calibration with the pH 7.00 buffer.
2. When the READY indicator displays in the left hand corner, press the CON button. The pH 7 calibration point stores in the meter.
3. The display changes so the larger numbers correspond to the calibration buffer value, at or around pH 7.00 (see bottle label) and the smaller display changes to another buffer value.
4. If you are satisfied with the buffer reading from the larger numbers, proceed to the pH 4 calibration. If the display changes more than a digit (0.01 pH) from the pH 7 calibration value for the temperature you are calibrating at (referenced on the buffer labels), repeat the pH 7 calibration.
5. Once the pH 7 calibration is stable, proceed to the next calibration point. The meter assumes the next point is pH 4 and displays this automatically on the smaller display. If the next calibration point you want to use is pH 10, use the ▲ or ▼ keys to select pH 10 in the smaller display.
6. Rinse the electrode (and the temperature probe if used) in deionized water, and dip electrode into the next buffer calibration solution.
7. When the READY indicator displays in the left hand corner, press the CON button. The next calibration point stores in the meter.
8. The display changes so the larger numbers correspond to the calibration buffer value at the calibration temperature (see bottle label) and the smaller display changes to another buffer value.
9. If you are satisfied with the buffer reading from the larger numbers and are finished calibrating, press CAL/MEAS to return to the measurement mode. You can begin measuring. If the display changes more than a digit (0.01 pH) from the calibration value for the temperature you are calibrating at (referenced on the buffer labels), repeat the calibration.


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10. Once the second calibration point is stable, proceed to the third calibration point. The meter automatically displays the third calibration point in the smaller display. To change the buffer value in the smaller display, use the up or down arrow keys.
11. Rinse the electrode (and temperature probe if used) in deionized water. Dip the electrode into the next buffer calibration solution.
12. When the READY indicator displays in the left hand corner, press the CON button. The next calibration point is stored in the meter.
    The display changes so the larger numbers correspond to the calibration buffer value at the calibration temperature (see bottle label), and the smaller display changes to another buffer value.
13. If you are satisfied with the buffer reading from the larger numbers and you are finished calibrating, press the CAL/MEAS button to return to the measurement mode and begin measurements.
    If the display changes more than a digit (0.01 pH) from the calibration value for the temperature you are calibrating at (referenced on the buffer labels), repeat the calibration.

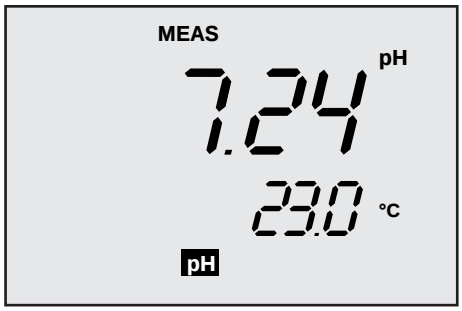


Figure 6

## Measurement

1. Rinse the electrode and temperature probe with deionized or distilled water.
   Rinsing removes impurities adhering on the electrode body, and activates the electrode if it dehydrated.
   If the electrode dehydrated, soak it in water for 10 minutes See “Electrode Care”, page 16-17 or the electrode instruction sheet.
2. Switch the meter on. Make sure the meter is in MEAS mode. See Figure 6.
3. Dip the electrode and temperature probe 1/2 to 2 inches into the sample.

Make sure the glass bulb of the electrode and 1/2” of the temperature probe is completely immersed into the sample.

4. Stir the electrode gently in the sample to create a homogeneous sample.
5. Take readings.

When the readings stabilize, a READY indicator displays. The READY mode shows the readings are stable within a range of ±0.01 pH. When this occurs, READY appears on the top left corner of your display. The reading holds until the measured value fluctuation exceeds the set limits.

## HOLD Function

HOLD freezes the displayed reading value. Use this function at any time when you are in the measurement mode.

**To hold a reading:**

Press the HOLD key. When the HOLD function activates, a HOLD indicator displayed on the left side of the display. See Figure 7.

**To release the HOLD on a reading:**

Press the HOLD key again. The HOLD function indicator disappears from the display.

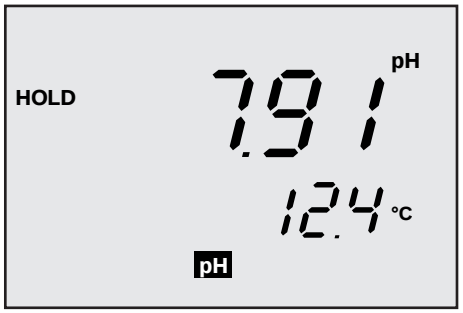



Figure 7

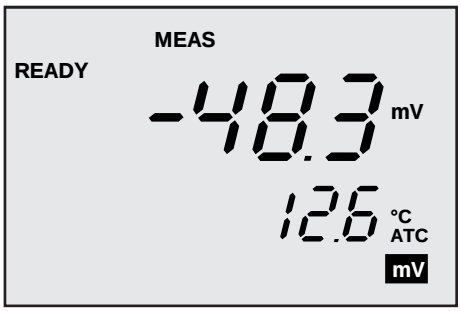


Figure 8

# 4. mV measurement (ORP or ISE)

1. Connect an ORP or Ion Selective Electrode (ISE) to the BNC input connector on the back of the meter. See “Back panel connections.”, page 5.
2. Turn the meter on.
3. Press MODE to select mV measurement (MEAS) mode.
4. Rinse the electrode and temperature probes with deionized or distilled water. Rinsing removes impurities adhering to the electrode or temperature probe.
5. Dip the electrode and temperature probe 1/2 to 2 inches into the sample.
6. Stir gently.
7. Take readings. When reading stabilizes, a “Ready” indicator displays. See figure 8. The READY mode shows the readings are stable within ±0.1 mV until the measured value exceeds the ±0.2 mV range.

NOTE: There is no calibration procedure for mV ORP or ISE measurements.

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# 5. Temperature calibration

### Manually setting the sample temperature without temperature probe attached

Using a thermometer, measure the temperature of the sample to be measured.

1. To set the sample temperature manually using software calibration, press MODE to enter the temperature mode.
2. Press CAL/MEAS to enter calibration mode.
3. Use the ▲ or ▼ keys to adjust the displayed temperature in the small lower numerical display to read your sample temperature.
4. Press CON to store the sample temperature setting.
5. Press CAL/MEAS to return to the temperature mode. The small lower numerical display retains the sample temperature setting if CON was pressed.
6. Press MODE to return to pH or mV measurement.

### Temperature Calibration (with ATC Probe Attached)

In this calibration procedure, the ATC probe is attached to the meter and the ATC annunciator displays on the right hand side of the LCD.

1. While in the measurement mode, press MODE to select the temperature mode (TEMP). Make sure you are in the MEAS mode before you go to the next step.
2. Press CAL to go into the calibration mode. The primary display shows the measured pH value, and the secondary display shows the temperature. See Figure 9.
3. Dip the temperature probe into a solution of known temperature, such as a temperature bath for a few minutes until the temperature probe stabilizes.
4. Press ▲ and ▼ to scroll to the correct temperature value corresponding to the known solution temperature. The meter allows a limit of ±5°C variation (with 0.1°C resolution) of the input reading, and of the original displayed reading.
   NOTE: If you encounter errors in calibration, see "Errors in Calibration", page 15.
5. Once you selected the correct temperature, press CON to confirm. The CON indicator flashes for one second and disappears. See Figure 10.
6. Press CAL/MEAS to return to the temperature mode. The temperature probe is now calibrated.
7. Press MODE to return to pH or mV measurement mode.

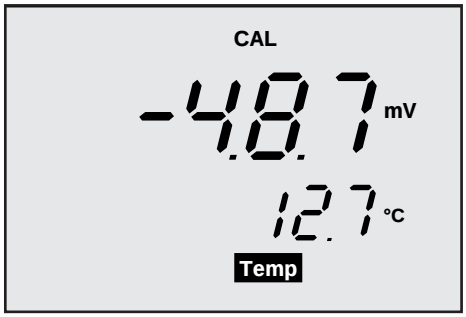


Figure 9

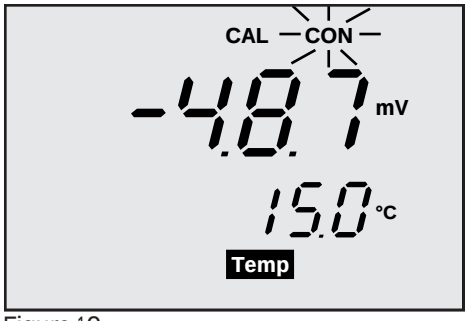


Figure 10

### Hardware Temperature Calibration

NOTE: Do this calibration once every 6 months to a year.

1. Switch the meter off to access this function.
   Make sure your temperature probe is attached to the instrument. You must have two temperature baths; preferably one set to 0.0°C and the other at 100°C. However, if you are using a combination pH and temperature epoxy electrode, use a temperature bath of 5.0°C and 50°C.
2. Press and hold CAL/MEAS and simultaneously press and release the ON/OFF button. Turn the meter on.
3. When the unit is on for 2 seconds, release the CAL/MEAS button. The display shows some flashing letters and numbers (version number).

The meter is ready for hardware temperature calibration.

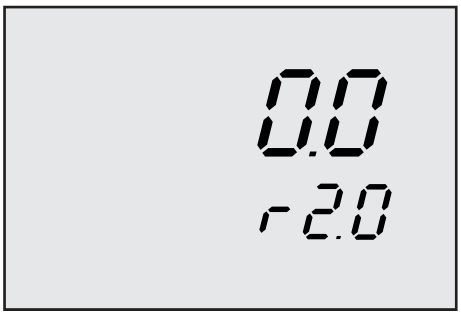


Figure 11

### Selection of 1st Temperature Point

1. Put the probe into the low temperature bath.
2. Press the CON key 3 times. You will see “r2.0” in the secondary display, and “0.0” in the primary display. See figure 11. “r2.0” indicates selection of the 1st temperature point.
3. Press the ▲ and ▼ keys, to adjust the number in the primary display to the actual temperature of your bath. For example, if your temperature bath is actually set at 0.5°C, adjust this number to 0.5.
4. Press CON to go to the A/D conversion value. See below.

If you don’t want to change the first temperature setting, press CAL/MEAS and skip to the solution of the second temperature point. If you pressed CON, go to the first temperature point calibration.

### Calibration of the First Temperature Point

1. Once the A/D conversion value is stable, press CON to store the calibration of the first temperature point.
2. Select the second temperature point.

### Selection of Second Temperature Point

Put the probe into the high temperature bath. You will see “r2.1” in the secondary display, and “100.0” in the primary display. “r2.1” indicates the 2nd temperature point. See figure 12.

1. Press the ▲ and ▼ keys to adjust the number in the primary display to the actual temperature of your bath. For example, if your temperature bath is set at 99.7°C, you can adjust this number to 99.7.
2. Press CON to go to the display of the A/D conversion values, **OR….**
   Press CAL/MEAS if you do not want to change this value, and skip to the end of the Hardware Temperature Calibration sequence. The LCD shows all the characters .
3. Press ON/OFF to turn the meter off.

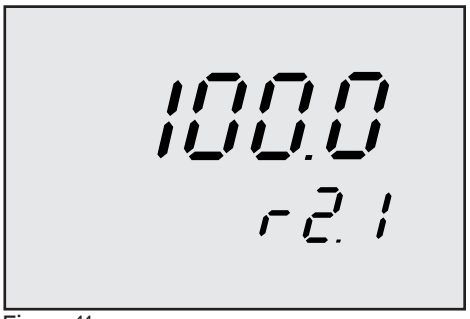


Figure 11

### Calibration of Second Temperature Point

1. Once the A/D conversion value stabilizes, press CON to store the calibration of the second temperature point. The LCD shows all characters and will remain frozen until the meter is turned off.
3. Press ON/OFF to turn the meter off.

The hardware temperature calibration is completed.

### LCD Testing

Once the temperature calibration is complete, the meter automatically tests each segment of the LCD. The testing runs continuously until you switch off the meter.

### Errors in Calibration

Whenever an error occurs during the calibration procedure, ERR displays on the bottom left hand corner of the LCD.

For ATC temperature calibration, ERR displays whenever the calibration value input into the meter differs from the initial value displayed by more than the allowable limit of ±5°C.

# 6. Electrode Care

## Electrode Activation

DO NOT touch or rub the glass bulb. If you follow the storing and maintenance procedure, you can use your electrode immediately. If the electrode responds sluggishly or drifts, the bulb may be dehydrated. Immerse the electrode in an ideal storage solution such as electrode storage solution or pH 4 buffer solution for 1-2 hours to hydrate it. See **Storing pH/ORP electrodes** below.

If this procedure does not hydrate the electrode, reactivate or replace it.

Use 2 or 3 point calibration to test your electrode performance. If you do not get good readings, use a different pH electrode to confirm the meter is working properly. If the results are still not satisfactory, consult your OAKTON distributor.

## Electrode Maintenance

pH electrodes are susceptible to dirt dehydration and contamination. Clean them regularly depending on the extent and condition of use.

## Storing pH/ORP electrodes

For best results, always keep the pH bulb wet, preferably in pH 4 buffer with 1% saturated KCl. Other pH buffers or tap water are also acceptable storage solutions. Do not store in de-ionized water. The protective rubber cap filled with buffer solution is an adequate method for storing pH electrodes.

OAKTON® offers a complete line of low cost electrode storage and cleaning solutions and containers.

## After Use

1. After each series of measurements, wash the electrode and reference junction in deionized water.
2. If using a refillable electrode, close the refilling hole by returning its rubber sleeve or stopper plug over the opening in the side of the electrode. See Figure 13.
3. Store the electrode as mentioned above.

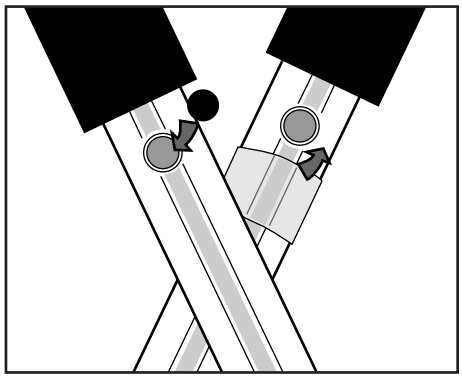


Figure 13

## Electrode Cleaning

Electrodes that are mechanically intact can often be restored to normal performance by one or a combination of the following options.

Some suggestions for:

a. *Salt deposits which are normal on all electrodes.*
Dissolve the deposit by immersing the electrode in tap water for ten to fifteen minutes. Thoroughly rinse with de-ionized water.

b. *General dirt and light oil coatings.*
Soak the electrode for several hours in OAKTON general purpose electrode cleaning solutions. Rinse in deionized or distilled water.

c. *Oil/Grease Films*
Wash the electrode pH bulb in a little dish washing detergent and water. Rinse the electrode tip with de-ionized water.

d. *Clogged reference junction*
Heat a dilute 1% KCl solution or pH 4.01 buffer solution to 60-80°C. Place the sensing portion of the pH electrode into the heated KCl solution for approximately 30 minutes. Allow the electrode to cool while immersed in some unheated KCl solution or pH 4.01 buffer solution. Rinse with deionized water.

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# 7. Troubleshooting

## Error Messages

The following table provides a guideline to enable diagnosis of possible problems indicated by the messages generated by the OAKTON WD-35617-series. The table also provides possible solutions to the problems encountered.

| Error Message | Indicates | Cause | Corrective Action |
|---|---|---|---|
| Err. 1<br>(In primary display) | Memory write error | Instrument too old (>10 years) or defective. | Turn off the meter and turn ON. Check hardware failure functions. Return to distributor if necessary. |
| Err. 2<br>(In primary display) | Memory checksum error | Hardware failure. | Turn off meter and turn ON. Check functions. Return to distributor if necessary. |
| Err. 3<br>(In primary display) | ADC error | Hardware error. | Turn off meter and turn ON. Check functions. Return to distributor if necessary. |
| Err. 4<br>(In primary display) | Keypad error. | One or more keys on the keypad are stuck/not working. | Turn off meter and turn ON. Check functions. Return to distributor if necessary. |
| Err. display | Wrong keypad input. | Button does not work in the current operation mode. | Release key. Select valid buttons depending on mode. |
| Electrode icon | Calibration | Buffer value does not match value displayed or electrode is disconnected or failing. | Use fresh buffer or check electrode connection. Possibly replace electrodes. |

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## Troubleshooting

| Problem | Cause | Solution |
|---|---|---|
| Nothing is displayed when the ON/OFF key is selected. | a. AC outlet power not switched on.<br>b. AC adapter socket not inserted properly. | a. Switch on the power supply<br>b. Re-insert Ac adapter socket. |
| Unstable reading | a. Insufficient reference electrolyte in electrode.<br>b. Broken electrode.<br>c. Electrical field interference (electrical noise caused by a nearby motor or ultrasonic device).<br>d. Dirty electrode | a. Fill electrode with reference electrolyte.<br>b. Replace electrode.<br>c. Remove or switch off interfering device.<br>d Clean the electrode. Hydrate if needed. |
| Slow response | a. Dirty electrode | a. Clean electrode. Hydrate if needed. |
| No response from keypad. | a. HOLD mode in operation Hold displayed. See LCD.<br>b. Internal program error. | a. Cancel HOLD mode. Press Hold button.<br>b. Reset all internal programs by re-inserting battery or remove A/C adapter from meter and re-insert. |

# Additional Information

## pH and Temperature

The pH electrode is affected by temperature changes. Automatic Temperature Compensation (ATC) compensates for temperature changes. Some solutions show an increase while others a decrease in pH with the same temperature change. Record the solution temperature along with the pH value, or the measurement may be meaningless. Temperature changes also affect the signal the pH electrode sends to the meter and causes a loss of accuracy for the reading. To limit the loss of accuracy during calibration, make the temperature of the pH buffer calibrating solutions and the sample solution the same.

## pH Buffer Calibration Solution

Use standard buffer solutions to calibrate a pH meter before you measure the pH of a sample. Calibration solutions serve as basis of comparison between measurements. The most common standard buffers are the pH 4.01, pH 7.00 and pH 10.01. For 1-point calibration, use a standard buffer of pH 7.00 or a standard buffer whose pH value is close to that of the sample. Use 2-point calibration when you know the sample is acidic (low pH) or basic (high pH). For acidic samples, use standard buffers of pH 7.00 and pH 4.01. For basic samples, use standards of pH 7.00 and pH 10.01. Use a 3-point calibration when the sample pH is completely unknown. Use all pH 7.00, pH 4.01 and pH 10.01 calibration solutions. Contact your OAKTON® distributor for information on pH buffer and calibration solutions.

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## Standard pH Buffers

The following table shows the various pH values at different temperature of the solution during calibration. The table also illustrates why a calibration value may be different from the buffer value at 25°C.

| Temperature | | pH buffer values | | |
|---|---|---|---|---|
| **°C** | **°F** | **4.01 (phthalate)** | **7.00 (neutral phosphate)** | **10.00 (carbonate)** |
| **0** | **32** | 4.01 | 7.12 | 10.33 |
| **5** | **41** | 4.01 | 7.09 | 10.25 |
| **10** | **50** | 4.00 | 7.06 | 10.18 |
| **15** | **59** | 4.00 | 7.04 | 10.11 |
| **20** | **68** | 4.00 | 7.02 | 10.05 |
| **25** | **77** | 4.01 | 7.00 | 10.00 |
| **30** | **86** | 4.01 | 6.99 | 9.95 |
| **35** | **95** | 4.02 | 6.98 | 9.92 |
| **40** | **104** | 4.03 | 6.98 | 9.88 |
| **45** | **113** | 4.04 | 6.97 | 9.85 |
| **50** | **122** | 4.06 | 6.97 | 9.82 |
| **55** | **131** | 4.07 | 6.98 | 9.80 |
| **60** | **140** | 4.09 | 6.98 | 9.77 |
| **70** | **158** | 4.12 | 6.99 | 9.73 |
| **80** | **176** | 4.16 | 7.00 | 9.69 |
| **90** | **194** | 4.20 | 7.02 | 9.66 |

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# 9. Specifications

**pH Range:** 0.00 to 14.00 pH
**Resolution:** 0.01 pH
**Relative Accuracy:** ±0.01 pH
**Slope Range:** 80% to 110%
**Temperature:** 0.0 to 100.0°C
**Resolution:** 0.1°C
**Relative Accuracy:** ±0.5°C
**ISE Millivolt Range (400 mV):** -400 to 400 mV
**Resolution:** 0.1 mV
**Relative Accuracy:** ±0.2 mV
**Overall Millivolt Range (1999 mV):** -1999 to +1999 mV
**Resolution:** 1 mV
**Relative Accuracy:** ±2 mV
**Display:** Dual LCD
**Inputs:** BNC, Phono
**Power Requirements:** 9V DC Adapter for 110/220 VAC
**Input Impedance:** $10^{12}\ \Omega$
**Instrument Drift:** < 50 uV/°C
**Input Bias Current:** 50 pA max. at 25°C
**Environment Requirements:** 0 to 50°C
**Meter Dimensions:** 7.2" L x 9.2" W x 2.52" H
(180 L x 230W x 63H mm)
**Hold function:** YES
**ATC Function:** 0.0 to 100.0°C
**Auto Shut-off:** After 20 min
**Averaging/Stability (Ready):** YES
**No. of buffer values:** 3
**No. of Calibration Points:** 1 to 3 Points

# 10. Accessories

To order some accessories, contact your OAKTON® distributor and describe the items listed below.

**WD-35615-05** ATC probe

**WD-35615-07** 110 VAC adapter

**WD-35615-08** 220 VAC adapter

**WD-35801-00** OAKTON general purpose pH electrode

**WD-35801-71** OAKTON All-in-One single junction sealed gel filled general purpose pH electrode with temperature sensor. Epoxy body.

**WD-35801-70** OAKTON All-in-One single junction refillable liquid filled general purpose pH electrode with temperature sensor epoxy body.

**WD-35801-72** OAKTON All-in-One double junction sealed gel filled, pH electrode with temperature sensor for dirty water, epoxy body.

**WD-00654-00** 1 pint. pH 4.01 buffer calibration solution

**WD-00654-04** 1 pint pH 7.01 buffer calibration solution

**WD-00564-08** 1 pint pH 10.00 buffer calibration solution

**WD-35653-00** 20 pouches de-ionized rinse water

**WD-35653-01** 20 pouches pH 4.01 buffer calibration solution

**WD-35653-02** 20 pouches pH 7.01 buffer calibration solution

**WD-35653-03** 20 pouches pH 10.00 buffer calibration solution

**WD-35653-04** Buffer pouches assortment pack, pH 4, 7, 10 and rinse water

# 11. Warranty

We warrant this product to be free from significant deviations in material and workmanship for a period of one year from date of purchase. If repair or adjustment is necessary and has not been the result of abuse or misuse within the one year period, please return, freight prepaid, and correction will be made without charge. Out of warranty products will be repaired on a charge basis.


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# 12. Return of items

Authorization must be obtained from your OAKTON distributor before returning items for any reason. When applying for authorization, please include data regarding the reason the items are to be returned.
NOTE: We reserve the right to make improvements in design, construction, and appearance of products without notice.