Digital pH Meter

KL04169

KegLand Distribution PTY LTD

www.KegLand.com.au

The digital pen style pH meter (KL04169) is an accurate, easy to use pen style device that has been designed with reliability in mind. The pH meter has a water-resistant casing, replaceable electrode, temperature sensor, ATC, digital calibration, and 0.01 pH resolution just like any high-quality pH meter should.

1. Technical Data/Specifications

pH Test Range	pH 0.01-14.00
Temperature Test Range	0-50°C (32-122°F)
pH Resolution	0.01 pH
pH Accuracy	0.05 pH
Temp Resolution	1°C (2°F)
Calibration	3 Point pH 4.00/6.86/9.18 @ 25 °C
Working Temperature	0-50°C (32-122°F)
Power	1.5V (LR44) x 4 pcs
Dimension	40mm Diameter x 185mm High
Weight	88grams

2. Battery Installation

Batteries are provided in the box for the Digital pH Meter. These will need to be installed prior to first time use.

Unscrew the battery case and place the batteries in position in the correct orientation.

If the screen shows a battery symbol, it means the batteries should be replaced.

3. Calibration

Calibration is required upon first time use.

It is best practice (for most accurate results) to calibrate prior to measurement of your samples. Frequent calibration is recommended. In addition, the pH meter should be recalibrated when:

1. The pH electrode or batteries are replaced
2. After testing aggressive chemicals
3. Where high accuracy is required
4. At least once a month (can be calibrated more or less often depending on the frequency of use and the accuracy required)

A minimum two-point calibration is required, however, performing a three-point calibration will result in more accurate results. For a three-point calibration calibrate the pH meter against all three standard buffer solutions; 4.00, 6.86 and 9.18. To quickly calibrate the pH meter if you didn't mind the results being slightly inaccurate you can perform a two-point calibration.

When performing a two-point calibration it is best to calibrate the pH meter against the standard buffer solutions which are closest in pH to the pH of the solution you will be measuring. For example: wort from the mash usually has a pH in the range of 5.2-5.5 and hence the pH meter should be calibrated against the standard buffer solutions of 4.00 and 6.86 at a minimum (if you wanted higher accuracy also calibrate against the 9.18 standard buffer solution).

3.1 Preparing the standard buffer solutions.

For each standard buffer solution empty the entirety of the sachet into a clean container or glass which can hold over 250mL.

Fill the container with exactly 250mL of 25°C distilled or deionized water (the conductivity should be less than 2µs/cm).

Stir the buffer solution until all the granules have dissolved into solution. After the granules are dissolved the standard buffer solution is ready to be calibrated against.

Repeat this process with all pH powders you are calibrating the pH meter against.

3.2 Calibrating the pH meter against the buffer solutions

Press “ON/OFF” to turn the pH meter on.

For best results rinse the electrode with distilled water and then rinse the electrode with the buffer solution being measured and then immerse the electrode into the buffer solution.

Stir the electrode in the buffer solution gently and then hold the “CAL” button for 3 seconds. Release the “CAL” button when the screen shows “CAL”.

The meter will show the current reading of the solution for 1 second, then, it will show the pH value of the buffer solution with automatic temperature compensation for 2 seconds. After that, the screen will show “SA” and “END” in sequence which means the calibration against this particular standard buffer solution is finished. After 1 second, the pH meter will be in measurement mode.

Repeat the above steps for all the standard buffer solutions you are calibrating the pH meter against.

Make sure to rinse the electrode with distilled water between taking measurements of different standard buffer solutions to eliminate cross-contamination between the samples. After rinsing with distilled water, it is then best practice to quickly rinse the electrode with the standard buffer solution to be measured.

Note: If the screen shows “END” after pressing the “CAL” key for 1 second, it means the buffer solution is invalid or the electrode is in bad condition. Press any key to switch back to measurement mode. In this case, please check the buffer solution and electrode to solve the problem.

Never take out the electrode from the buffer solution before the screen shows “END”, otherwise, it may cause inaccurate readings.

4. Operation (measuring the pH of your sample)

1. Remove the protective cap.

2. Clean the electrode with distilled water, and dab up the excess water on the electrode with filter paper. Do not wipe the electrode with filter paper as static discharge can result in inaccurate results or damage the electrode.

3. Press the “ON/OFF” key to turn on the power.

4. Immerse the electrode into the test solution. Stir gently, then, wait until a stable numerical result is displayed on the screen. The upper number is the pH value and the lower number is the temperature of solution.

5. Press the “Hold” key to keep the current value, press the “Hold” key again to release it for re-measurement.

6. Press “ON/OFF” key to turn off the power after use, then clean the electrode with distilled water and dab the excess water off the electrode with filter paper. This instrument will automatically shut down if it is not used for 5 mins.

7. If measurements are taken in different samples successively, rinse the electrode thoroughly after the first measurement to eliminate cross-contamination; and after cleaning, rinse the electrode with some of the sample to be measured.

8. After all the measurements have been taken, clean the electrode with distilled water and dab the electrode dry. After use place the cap on the electrode ensuring that the sponge in the cap is saturated in 3mol/L KCL storage solution (KL04183).

Note: To convert the unit between “°C” or “°F”, while powered off, press and hold the “CAL” key first then simultaneously press and hold the “ON/OFF” key, release both keys when the right side of the screen shows “°C” or “°F”, then, press the “CAL” key to choose the unit you prefer, after that press the “HOLD” key to save the unit, the screen will show “SA” then “END” which means the unit you’ve chosen is saved. The meter will be in measurement mode automatically after 1 second.

If the pH value of the test solution is lower than “0” or higher than “14”, the meter will show “L---” or “H---”. If the temperature is too low or too high, the temperature zone on screen will show “L” or “H”.

5. Maintenance

1. The preparation of the calibration buffer solution must use distilled water or deionized-Ion water, the conductivity should be less than 2μ s/cm.

2. The calibration buffer solution should be stored in the refrigerator (low temperature around 5-10°C), can be used for 2-3 months. If there is discoloration, mildew or sediment in the solution indicating the solution has been contaminated, do not use and discard. It is best practice to only use the buffer solution once as unless your cleaning regime is perfect it is quite easy to contaminate the buffer solution. For most accurate calibration it is best to calibrate with a fresh buffer solution.

3. Don't use the calibration buffer solution that is older than 2-3 months. Don't pour the used calibration buffer solution into the unused calibration solution bottle.

4. Use the two calibration buffer solutions which are closest to the pH value of the sample you’re testing and the calibration solution temperature as close to the sample temperature as possible.

5. The electrode should not be immersed in distilled water for a long period. Doing so can damage the electrode resulting in inaccurate measurements. Only store in 3mol/L KCl solution.

6. In the protective cap there is a sponge absorbed with 3mol/L KCl solution which is used to keep the electrode hydrated. Replenish this solution to prevent the probe from drying out while in storage using KegLand 3mol/L KCl Electrolyte Solution (KL04183).

7. Avoid physical damage to the fragile pH electrode and temperature probe. Always store in the protective cap when not in use.

8. When changing from one solution to another solution, the electrode should be cleaned with distilled water and excess water dabbed with filter paper. Do not wipe the glass ball to avoid sluggish response as static discharge can damage the electrode. It is best to take two samples of the test solution and rinse the probe in one of the samples before taking the reading from the second.

9. Restrict the time the electrode is immersed in strong acid and alkali solutions, after testing rinse well. Recalibrate the pH meter after testing of strongly acidic or alkaline solutions.

10. The slope and response time of electrode will decrease a little after extended periods of time, please immerse the electrode ball for 24hours into 0.1 mol/L HCL solution (preparation: 10ml 1M HCL diluted with 90ml deionised water).

5.1 Troubleshooting the Electrode

If the instrument is working but the reading is unstable, the instrument responds slowly, or cannot be calibrated to the right pH value, please check electrode first as below:

1. Whether electrode sensor is immersed in testing liquid or not.

2. Electrode ball is not dirty or contaminated from previous samples.

3. Electrode is well connected, and glass ball is in good condition.

If the reading is still unstable and cannot be calibrated the electrode will need replacing (KL04176).

5.2 Troubleshooting the Calibration Buffer Solution

If the instrument and the electrode is operating well, the readout is not correct or cannot be calibrated, please check the standard buffer solution:

1. Check the calibration buffer solution liquid is made up correctly as per instructions above.

2. The buffer solution is less than two months old and not contaminated

TABLE 1.1 – Reference Table For Buffer Solution

Temp	0.05mol/kg Potassium Hydrogen Phthalate	0.025 mol/kg Phosphate Mixture	0.01mol/kg Borax
0°C	4.01	6.98	9.46
5°C	4.00	6.95	9.39
10°C	4.00	6.92	9.33
15°C	4.00	6.90	9.28
20°C	4.00	6.88	9.23
25°C	4.00	6.86	9.18
30°C	4.01	6.85	9.14
35°C	4.02	6.84	9.10
40°C	4.03	6.84	9.07
45°C	4.04	6.83	9.04
50°C	4.06	6.83	9.02
55°C	4.07	6.83	8.99
60°C	4.09	6.84	8.97
70°C	4.12	6.85	8.93
80°C	4.16	6.86	8.89
90°C	4.20	6.88	8.86
95°C	4.22	6.89	8.84