

# 12 Steps To Precise pH Measurement

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You want good pH data. Who doesn't? You deserve good data, but for good pH data you need to calibrate. You need to calibrate well and calibrate often. For more precise pH measurement, you should calibrate before each measurement, but a good rule of thumb to follow is to calibrate your pH meter at the beginning of each day.

OK, so we know we must calibrate, but for some reason your pH probe is not calibrating.

There are several things you should check for if you're experiencing pH calibration problems.

## **1. Check the age of the probe.**

Probes for your pH meter generally last 12-18 months. This holds true whether the probe is being used or not. The lot code will determine the age of your pH probe. A lot code is two numbers than a letter. The numbers indicate the year of manufacture and the letter indicates the month, i.e.-A=January, B=February, C=March etc. Please note that the letter "I" is not used, this means H=August and J=September and so on.



Lot code ex:12A\*

\*probe was manufactured in January '12

## **2. Perform routine maintenance.**

Keeping your pH probe clean can also help eliminate pH calibration problems. If the reference junction on the probe is not clean the probe may become unresponsive. Soak your probe with 1:1 bleach water solution for about 30 minutes regularly to reduce the chances of this happening. If hard deposits have built up on your probe, you can clean these by soaking the pH probe in vinegar or 1M (molar) HCL (hydrochloric acid) for about 3 minutes. pH probes usually require weekly or monthly cleanings.

Always check your pH meter manual for calibration and routine maintenance information.

## **3. Check for physical damage to the probe.**

If your probe is damaged, broken glass bulb, crack in the glass etc., the probe must be replaced.

## **4. Confirm that the pH probe has never dried out.**

Always store your pH probe in a moist environment or submerged in buffer 4 solution. If you find your pH probe has dried out, it will have to be replaced.

## **5. Check the temperature probe used with your instrument.**

Check your probe's temperature specifications. pH will not function accurately if the temperature probe is out of specification.

**6. Always use fresh, unused, unexpired pH buffers for calibration.**

You never want to re-use buffers for calibration. Once buffers are used for calibration, they are assumed contaminated. Re-using buffers can lead to slow responding pH probe performance or the inability to calibrate at all. This re-use can also make it difficult to determine whether the probe or the buffers are causing the pH calibration failure.

A good way to use re-used buffers is for probe rinsing only.

**7. Perform at least a 2-point calibration-Buffer 7 MUST be one of these two points.**

**8. Always start with Buffer 7 when calibrating your instrument even though it is not always required.**

**9. Reset the calibration to factory default is possible.**

Not all instruments are equipped with this ability. It is a good idea to consult the user manual. The user manual will also supply the proper process to do this task because this process can vary depending on the instrument.

**10. Confirm the pH probe response time in each buffer.**

Response time should be no longer than 60 seconds. Response time can depend on the age and cleanliness of your probe.

**11. Check the millivolts in each buffer.**

- Buffer 7 should be 0+/-50 mV.
- Buffer 4 should be 165 to 180 mV away from the buffer 7 mV value, in the positive direction.
- Buffer 10 should be 165 to 180 mV away from the buffer 7 mV value in the negative direction.

**12. NEVER accept out-of-range calibrations.**

If you accept an out-of-range calibration, your probe will not calibrate. It is highly likely you will not collect any usable pH data if an out-of range calibration is accepted.