

pH CALIBRATION

Why calibrate?

Calibration of your pH electrode is necessary for compensating for the natural error which occurs due to the chemical changes within the electrode. Calibration should be done regularly, preferably once a week. Even if an electrode has never been used before, an error will occur over time.

Most common buffers for pH are pH 4.01, pH 7.00 and pH 10.01. The choice of buffers depends on the range you are measuring in and the setting of your meter. There are a couple of international accepted standard solutions: USA, NIST and DIN standards.

- USA pH 1.68, 4.01, 7.00, 10.01, and 12.45.
- NIST pH 1.68, 4.01, 6.86, 9.18, and 12.45.
- DIN pH 1.09, 3.06, 4.65, 6.79, 9.23, and 12.75.

It is advised to always calibrate at least at 2 points, starting with pH 7.00 (USA), pH 6.86 (NIST) or 6.79 (DIN).

Which points to calibrate?

Choose calibration standards that are close to the expected value that you intend to measure. The more points you calibrate the higher the accuracy.

Advised calibration solutions:

Expected value	USA	NIST	DIN
Between pH 0 and 4	1.68, 4.01 and 7.00	1.68, 4.01 and 6.86	1.09, 3.06 or 4.65 and 6,79
Between pH 4 and 7	4.01 and 7.00	4.01 and 6.86	3.06 or 4.65 and 6,79
Between pH 7 and 11	7.00, 10.01	6.86, 9.18	6.79, 9.23 and 12.45
Between pH 11 and 14	7.00, 10.01 and 12.45	6.86, 9.18 and 12.45	6.79, 9.23 and 12.45

Calibration procedure:

1. Pour some of the pH 7 buffer in a clean cup.

Note: NEVER CALIBRATE DIRECTLY IN THE BOTTLE, THIS WILL CONTAMINATE THE SOLUTION AND MAKE IT USELESS!!!!

2. Connect the pH electrode and if necessary the temperature probe to the meter.

Note: the temperature probe is necessary for temperature compensation, calibrating with temperature compensation gives the most accurate values.

3. If necessary, remove the electrode protective cover
4. Immerse the pH electrode for about 2 cm in the calibration solution. Also immerse the temperature probe in the solution. (make sure the bulb is fully immersed (figure 1)).
5. Stir the electrode in the buffer to create a homogenous solution
6. Wait until the meter shows a stable value
7. Confirm the value in the meter
8. Take the electrode out of the buffer solution (do not throw back the solution in the bottle, this will cause contamination of the buffer!!)
9. Rinse the electrode with a rinse solution, de-ionized water or with some of the next buffer.
10. Put the electrode in the next buffer solution and repeat above procedure until all the desired points are calibrated.

