



Manufacturers of pH and D.O. Sensors
for Science and Industry

FAQs Regarding the Calibration of pH Electrodes

Is it possible to receive a “calibration certificate” for pH electrodes?

Broadley-James electrodes are tested in NIST-traceable buffer solutions and their output is measured to see if it falls within an acceptable range. If so, the electrode receives a *Quality Assurance Certificate* which specifies the performance criteria. However, the electrode is not “calibrated”; rather, it is proven to be “calibratable” when used together with a good quality instrument and known buffer solutions.

While a *pH measurement system* can be calibrated once installed in a lab or plant setting, an electrode by itself cannot. The electrode has to be placed in a buffer solution and connected to a pH meter in order for the system to be calibrated. And then, it is only the “system” that is calibrated, not the electrode independently. Any change in the characteristics of the system and the calibration is lost.

Secondly, the calibration drifts with time, so frequent re-calibration of the system is necessary. In critical lab samples, calibrations are performed between each measurement, sometimes as often as hourly. In process applications it is sometimes done once per shift, once per day, or once a week. In either case, it is always the “system” which is calibrated, not the electrode. The electrode’s output is never changed by the system calibration; any changes attributable to calibration occur within the electronics of the instrument.

Then is it possible to receive a “calibration certificate” for an instrument, if purchased as a “system”, complete with electrode?

Here the answer would still be “no”, due to the variable nature of the system; it may or may not hold its calibration during shipment. In addition, it is always necessary to re-calibrate a system once it is installed where it will be used for actual measurements. So, “pre-calibration” is not possible.

The conventional approach is to verify the functionality of the instrument using electronic simulation. The electrode is compared to known standards, as described above. Given the acceptable performance of both instrument and electrode, it is a given that the two can be calibrated using NIST buffer solutions.

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