

Dear Partners!

We bring to your attention a list of typical user errors when starting and working with the CRYSTAL station and ways to eliminate them.



The text will contain references to paragraphs of the Installation and Operation Manual for CRYSTAL stations. This document is available for download on our website at <https://darin7.ru/index.php#big-form2> . Throughout this letter, this Manual will be referred to as "IOM" for brevity.

THE pH-ELECTRODE CANNOT BE CALIBRATED.

Cause 1: The new electrode has not been properly adapted to the water in the measuring cell (at least 10 hours).

Procedure:

- the electrode must be placed in the measuring cell and the wires must be connected to the corresponding terminals of the CRYSTAL controller;
- apply power to the CRYSTAL controller, that is, it must be turned on;
- leave the electrode in this position, while **not performing any calibrations for at least 10 hours** (see section 4.6.16 of the IOM).

If you do not hold the connected electrode to the switched on CRYSTAL controller for less than 10 hours, then the signal generated by such an electrode may be incorrect. That is, the installer arrives at the start of the station, connects the electrode and calibrates it in an hour (time is money!), but the pH electrode sometimes cannot be calibrated - bad steepness! This happens pretty often!

The electrodes have a small hole located at the bottom of the electrode (see Fig. 4.4-1 of the IOM), into which a diaphragm is inserted – contact with water occurs through it. So, the diaphragm needs time for it to "get wet" in the water and adequate measurements begin. For some pH electrodes this happens almost immediately, others need 2-3 hours, and sometimes 10 hours is not enough (there were electrodes that "start working" on the third day).

With the CL-electrode, this happens less often, but the adaptation of the electrodes to water, connected to the switched on controller of the CRYSTAL station, must be done !

Cause 2: During calibration, the electrode was not sufficiently exposed to the buffer solutions.

If the electrode is new, then during the first calibration (after adaptation to water for at least 10 hours!), It is advisable to hold it in each buffer solution for at least 2-3 minutes, for subsequent recalibrations 1-2 minutes are enough.

Insufficient time of the electrode exposure to the buffer solution results in situation when the electrode does not have time to generate a sufficient output voltage and the calibration ends with a message about a bad electrode steepness.

Cause 3: Poor quality buffer solutions were used to calibrate the pH electrode.

The recommended shelf life of buffer solutions is 6 months. After this period, the quality of the solution may deteriorate and the calibration results obtained with it may be incorrect.

Buffer solutions should be stored at a temperature not exceeding 20°C. Very often the temperature in the technical room of the pool is 25-30°C, or even more! In such a case, it is best to store the buffer solutions separately under proper conditions. In addition, the User can, by its unskilled actions, degrade the quality of even those buffer solutions shelf life of which has not expired. In particular, if the User neglects the requirement to wipe it dry before immersion in the buffer solution, then the contents of the solution bottle will be gradually diluted with the liquid flowing from the electrode after the previous immersion, i.e. the quality of the buffer solution will gradually deteriorate.

Thus, if the results of the pH electrode calibration are unsatisfactory, then, first of all, it is necessary to try to repeat the calibration with a different, obviously high-quality set of buffer solutions. The recalibration results may be different.

An experienced service technician, coming to the pool for work, always brings his own buffer solutions, which he had previously stored at the required temperature and they are “fresh” (purchased no later than 6 months), thereby guaranteeing that Cause 3 is eliminated.

Cause 4: The pH electrode has become unserviceable due to improper storage.

It happens that the purchased CRYSTAL station has been in the Partner's warehouse for several months before installation, even the one installed at the facility is waiting for launch for several months – this is a real situation! In this case, it is necessary to remove the electrodes from the common box of the station **and store them in an upright position with the head with the wire faced upwards!**

To do this, there is a corresponding instruction on the common station box and on the individual electrode box (yellow stickers).

For seasonal pools, preserving electrodes for the winter is a challenging task! It is very often found in the spring that the electrodes have become unusable due to improper storage during the seasonal conservation of the pool.

Do not store electrodes in water! It is necessary to place the electrodes for storage in a KCl solution (as required by clause 6.1 of the IOM), otherwise the pH electrode may not produce the required voltage difference in the buffer solutions during calibration.

P.S. You can try to “revive” such a deteriorated pH electrode. To do this, you need to hold this electrode for 2-3 days in running non-acidic water. Perhaps, after that, it will be able to give the required voltage difference during calibration (at least 100 mV). But this method does not always help, and then you just have to change the pH electrode with a new one.

Best regards, DARIN