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# pH Neutralization System Start-Up, Calibration, Instruction & Training (Commissioning)

## Important Attendees:

T & C representatives and/or installers (plumbing contractor), owner's maintenance people and science department lab head or teacher. The following are optional: Facilities head person, general contractor and/or construction manager. (The electrician is necessary for systems that have chemical treatments with pumps and mixers.)

## Supplies Needed:

One (1) gallon of bottled water.
(Spring or filtered only – do **not** use distilled, de-ionized or de-mineralized water.)

Three (3) Styrofoam coffee cups (bring six [6]; three [3] as spares).

Three (3) pH buffer test solutions (pH of 4, 7 and 10).

(Owner may have in lab or can obtain from lab supply company, such as Fisher Scientific, VWR Scientific, etc).

The pH glass electrode shipped in control panel, loose in a white box.

Horn also shipped in plastic bag, loose in control panel.

## Instructions:

Explain in detail, each component of the system, including how the tanks work, limestone chips, chemical feed, low level alarms, mixer, pH range and set points, rest of panel, including recording and possible separate leak detection. (Example: clicking noise of inkless chart paper is normal.)

1. Make sure power plug is plugged in and turn power with lower left hand toggle. If green light goes on, then you have power. Shut it off immediately. (Do not pay attention to any readings, yet.) If power is not on, find out if circuit is on, if plug is in properly or if fuse in face of panel is blown?
2. Mark the three (3) cups with a separate large 4, 7 and 10 on them, with a pen.
3. Fill each cup three quarters (3/4) of the way with the correct pH solution.
4. Set the temperature(s) in the control panel at 25°C.
5. Set the high pH black knob at bottom right to 8.5 pH.
6. Set the low pH black knob at bottom right to 5.5 pH.
7. Set the top toggle switch to the down "norm." position.
8. Set the center right three (3) position toggle to the extreme right "pH" position.

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9. Carefully take pH electrode out of white box. It is made of glass and very expensive! Wash and pry off plastic protector carefully on tip of electrode. It should have a little bit of salt water to preserve it. Then, plug it in the right hand side to control panel. If there are two (2) BNC connectors, then plug it into the lower one, which would be marked "controller".
   Put electrode into Styrofoam cup marked pH 7. Turn power on with lower left hand toggle switch. (On units that have 2 BNC connectors on right side of panel, the toggle switch has 2 "on" positions. One "on" is without recorder and second "on" is with recorder clicking.)

10. Explain about pH: acid, neutral and caustic/alkaline. The needle on the large pH meter should go to 7 when the electrode is put in the liquid in the cup marked 7 (we only use the upper scale on the meter, which is the pH scale. We do not use mill volt [MV] scale). Give it about a minute or so to get to 7. It could be a half of degree off, since it is not critical. If it does not go to 7, than adjust the black knob in the upper right of the panel (knob marked "set"). Turn knob to make it go to 7.

    Rinse bottom of electrode off with bottled water. Then, take electrode out and put into cup marked pH 4. Give about a minute and make sure probe goes close to 4. If not, use a big black "set" knob in upper right hand corner to get it to go to 4. Then, take out of cup and rinse bottom of electrode with the bottled water and put back into pH 7 cup. It should go back to 7 in about a minute. (If not, tweak it with the black "set" knob.) Then, rinse it with the bottled water again and put it in the pH 10 cup. It should go to 10 in about a minute. If not, use the black "set" knob to adjust it. Finally, rinse it with the bottled water again and put it back in the 7, making sure it goes back to 7. Use the black "set" knob, if needed. (By the way, there is a tiny setscrew to the left of that knob for some cases where very fine tuning is needed of the pH adjustments.)
    There is a black knob and setscrew to the left of the recorder for the calibration of the pH reading on the recorder. You must use the upper recorder BNC connector on the right hand side of the panel for the electrode to be plugged in, for calibrating the recorder.
    If your system has extension cables, the pH electrode should be plugged in directly to the panel for calibration purposes, bypassing the extension cables.

## Maintenance & Consumables: (Owner to do)

- Change chart paper in recorder once a month. (Sign & date when putting in and taking out.)
- Check recorder instruction manual on how to put paper in and take out.

(Be careful not to break or bend recorder needle.)

- Order several months of chart paper, if you have a recorder.
- See limestone maintenance sheet and limestone literature.