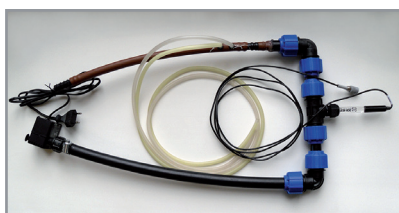
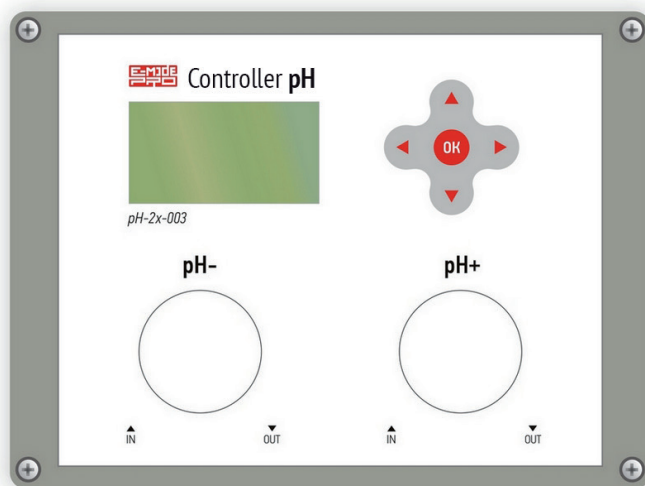


Controller pH-2x-003

A device to measure and regulate pH level in liquids

Complete Set:

Controller pH-2x-003 - 1 pcs.
pH electrode ЭСК-10317/4 - 1 pcs.
Sampler - 1 pcs.
Calibrating solution (pH 4,01 and pH 7,01) - 2 pcs.
Pump - 1 pcs.



Range of Measurements:	pH 0..14pH
Temperature range:	20..100C
Coordinates of an Isopotential Point:	pHi=4,00

Warranty:
Warranty period is one year since the purchase date if properly used and all the instructions in the manual are followed.

WARNING!

Only 20%-30% solutions (acid pH down, alkali pH up) should be used as reagents.
More concentrated reagents will disable the device!

Recommendation:

Do not set a hysteresis lower than 1, it can cause difficulty with nutrients absorbtion (or even lead to plants dying) and reagents overuse.

User Manual

Controller pH-2x-003 consists of:

- 2 peristaltic pumps: 1st - for acid
2nd - for alkali
- graphic display and keyboard - for settings.
- PI-regulator - as a controller
- A sampler with an industrial combined pH electrode (ЭСК-10317/4) inside - to measure pH level.

A sampler is supplied with a pump pumping the solution.

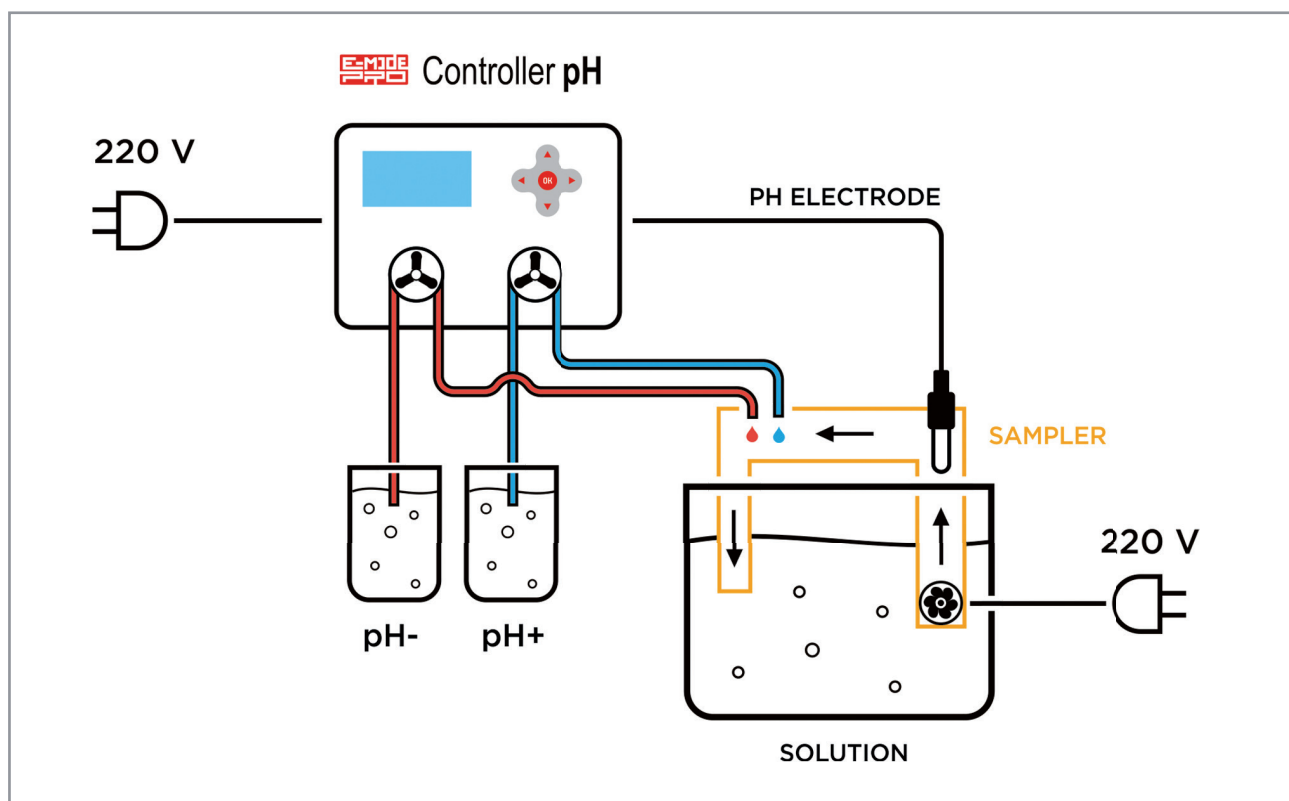
WARNING! The pump should be always in operation to avoid electrode drying up. Dried up electrode can lead to material misstatement of pH level measurements!

Controller pH-2x-003 Functions:

- measurement and regulation of pH level by means of PI-rule and peristaltic pumps
- graphic display showing current pH level
- automatic or manual adding of a required dose of the reagents (pH up and pH down)

Operation Conditions:

- Temperature: from +10 to +50°C
- Maximum air humidity: no more than 90% if the temperature is +35°C and lower, but without moisture condensation
- Power-carrying capacity: from 200V to 250V
- Frequency: 47...63 Hz



Before Operation

Device Setting Up

Place the device anywhere you wish at a distance no longer than 1,5 m (cable is 2 m long) far from the tank with a proper pH level to keep up in. Place a sampler into the tank (see picture) and set the electrode there.

Outlet pump hoses should be connected to the sampler.

One end of the hose should be connected to the pump, the other end should be placed into the acid or alkali according to the type of the pump.

Then the pump and the device itself can be plugged in.

A proper pH level necessary to be kept up (see 2) and volume capacity (see 4.2) should be set.



Setting the Device

As soon as the device is plugged in a logotype is displayed and operating mode is on.

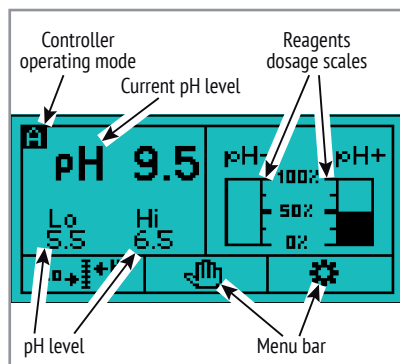
1. Main window

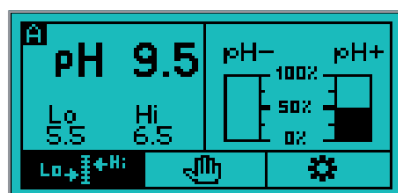
Main window displays a current pH level.

«A» in the top-left corner means an automatic mode is on, t.i. the reagents are added automatically if needed. If the automatic mode is off (see 4.2), «A» is changed for «m» and the reagents are not be added, only pH level is displayed.

Under the current pH level, pH level of the solution kept up by the device is shown.

The picture shows that the device is set to keep up hysteresis (upper and lower limits of pH levels) from «LO» - 5,5 to «HI» - 6,5 (recommended).





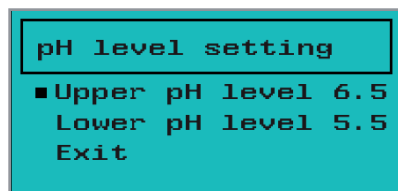
Hysteresis setting is described in article 2.

Reagents dosage scales are displayed on the right. If both scales are empty, the pH level is normal. If one of the scales is colored (as shown in the picture), then some reagent is periodically added (in this case pH up). The level of scale's coloring reflects reagent's dose.

At the very bottom of a display there is a menu bar.

To enter Menu press «OK» button, first window in the menu bar will be selected. This is a Menu window to enter hysteresis settings.

Use ← and → to move along in the menu bar.



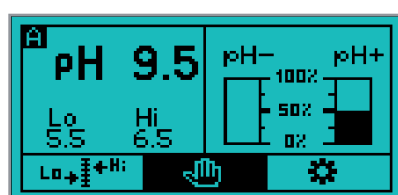
2. pH level (hysteresis) settings

Select pH level settings window, then press «OK» button once again, pH level settings window is opened.

Set the limit for the upper pH level, then with ↓ get down to set the limit for the lower pH level, also set a pH level you need. The pH level of the solution will be kept up within these limits.

You can select options in the menu only moving with ↓.

To exit pH level settings select «Exit» and press «OK» button.



3. Manual Control

«Manual Control» mode is for manual dosage of the reagents. With this mode it is possible to choose doses from 1 ml to 10ml.

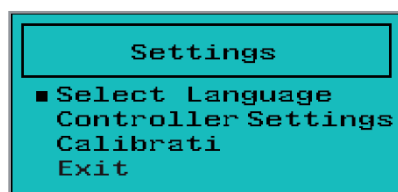
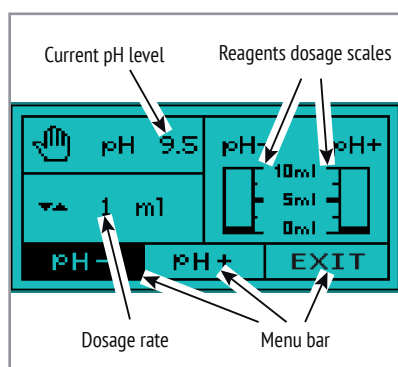
In the menu of the main window select the window in the middle with →.

Press «OK» button to open manual control window.

In the top-left corner a current pH level is displayed. Below there is the volume of a chosen dose. On the right there are graphic scales indicating selected doses for both reagents. The reagent you need is selected in the menu bar.

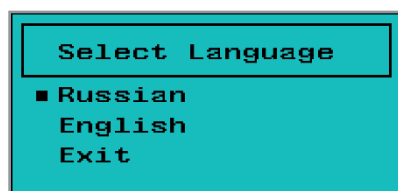
Select the reagent and its dose you need and press «OK», a corresponding pump is switched on, and a selected dose of the reagent is added into the tank.

To exit this mode get to «Exit» in the menu bar and press «OK» button.



4. Settings

Select the middle window with → in the menu bar of the main window. Press «OK» button to open Settings window.



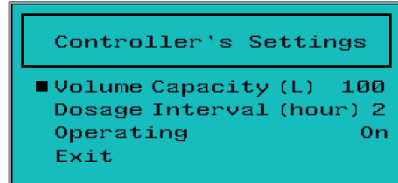
4.1. Select Language

English or Russian are offered to select.

4.2. Controller Settings

Here operation factors and modes of regulation are set.

- Volume capacity to keep up a proper pH level is set in the first line.
Possible volume capacity: 20 - 200 L.
- Dosage interval is set in the second line.
Possible interval: 0,5 - 48 hours.
- Controller mode is selected in the third line: On/Off.



4.3. Calibration

This option is for calibration.

Two calibrating solutions (pH 4,01 and pH 7,01) are used for calibration. The solutions are supplied.

Calibrating Method

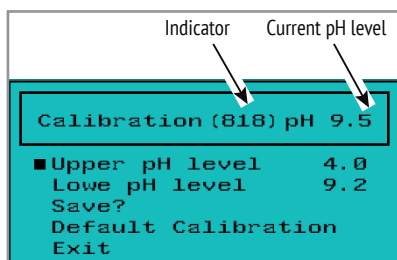
Select «Lower pH level» in the menu and put pH electrode into the solution with a lower pH level and wait until the indicator value (top line) remains unchanged or changes a little.

Press ↓ to get to «Upper pH level». This pH level is saved in the device's memory.

Take the electrode out of the solution with a low pH level, rinse the electrode, and put it into the solution with a high pH level.

Wait until the indicator value is set and get to the option «Save?», press «OK» button. The pH level of a calibrating solution is displayed near the indicator.

To reset to default settings get to a corresponding option and press «OK» button. Calibration is over.



NOTE!

While calibrating do not touch the electrode or its wire. Exactly follow the instructions in this manual. Do not take the electrode from the first calibrating solution until "Upper pH level" gets to the second menu item.

Default Settings:

Hysteresis	5,5 – 6,5
Volume Capacity (L)	100
Dosage Interval (hour)	2
Automatic Mode	On

Purchase Date/Seller's stamp _____

Serial Number _____