

## **GB** Introduction

**Dear Customer,**

**In purchasing this Voltcraft® product, you have made the right decision for which we would like to thank you.**

You have purchased an outstanding product belonging to a brand family distinguished for its special competence and constant innovation in the field of measurement, charging and power supply technology.

With Voltcraft®, you will be able to cope even with difficult tasks as an ambitious DIY enthusiast just as much as a professional user. Voltcraft® offers you reliable technology at an extraordinarily favourable cost-performance ratio.

We are certain: your investment in a Voltcraft product is also the beginning of a long and profitable collaboration.

**We wish you much enjoyment with your new Voltcraft® product!**

## **Product description**

The PH-212 is a device for the measurement of the pH value of planting soils and other soft-mud-like media. This device can determine how acidic or alkaline the media under investigation are in a simple manner. The highly precise pH electrode is encased in a special Epoxy body, which makes the electrode extremely durable. Thanks to the two-point calibration and automatic temperature compensation, the device is very accurate. The display unit is splash-proof and therefore ideally suited for the application in gardening, laboratories and in the household etc.

The PH-212 was designed in accordance with the state-of-art technology and fulfills the requirements of the applicable National and European directives. All the corresponding documents have been backed up by the manufacturer.

## Table of contents

	Page
Introduction .....	13
Product description .....	13
Intended Use .....	14
Safety Instructions .....	15
Scope of Delivery.....	16
Controls .....	17
Initial Operation .....	17
Wiring.....	17
Making a measurement .....	19
Maintenance and cleaning.....	20
Changing Batteries .....	20
Disposal of run-down batteries .....	21
Disposal .....	21
Technical data .....	22

## Intended use

Measurement of the pH value of non-combustible or non-corrosive soft-muddy media free of voltage such as planting soils, liquids etc. from 0.0 to 14.0 pH.

Only a 9 V battery pack (type 1604A) may be used as a source of power.

The measured values are displayed digitally on a large LCD (Liquid Crystal Display).

The current measured value can be retained with the Hold function.

Measurements must not be carried out under adverse ambient conditions. Adverse ambient conditions include the following: dust and inflammable gases, vapours or solvents, storm and/or stormy conditions such as strong electrostatic field etc.

## Technical data

### PH-212 pH measuring device

Battery .....	1x 9 V battery pack (006P, MN1604)
Resolution .....	0.01 pH
Measuring range .....	0.00 – 14.00 pH
Accuracy (23 ± °C) .....	± 0.07 pH (pH 5 - pH 9) ± 0.1 pH (pH 9 to pH 14) ± 0.2 pH (pH 1 to pH 3.9)
Measurement rate .....	2.5 measurements per second
Response time .....	10 sec. (90% RH/25°C calm)
Operating conditions.....	Temperature 0°C to +50°C Rel. humidity < 85%, non-condensing
Storage conditions .....	Temperature -10°C to +60°C Rel. humidity < 85%, non-condensing
Weight (incl. battery) .....	approx. 190 g
Dimensions (LxBxH) .....	135 x 60 x 33 (mm)

### Soil pH electrode

Measuring range .....	1 to 13 pH (typically 0 – 14 pH)
Operating conditions.....	5 to 60 °C
Reference of the electrode .....	Ag/AgCl
Zero potential .....	7 ± 1 pH
Response time .....	>= 2 Minutes
Dimensions .....	160mm length, Ø 12mm, cable length 1m
Connection plug .....	BNC standard

Any use other than that described above will lead to damaging the product. No part of the product may be modified or altered! The safety instructions should be observed without fail!

## Safety instructions



Please read through the operating instructions completely before commissioning the system; they include important information necessary for correct operation.

Damages resulting from the non-compliance with the operating instructions are excluded from any warranty claims! We shall not be liable for any consequential damage!

We do not accept any liability for personal injury or damage to property caused by incorrect handling or non-compliance with the safety instructions. The guarantee will become void in these cases.

This device left the factory in perfect technical condition. To maintain this status and ensure safe operation, the user must comply with the safety instructions and warnings contained in these instructions for use. The following symbols must be observed:



A triangle containing an exclamation mark indicates important information in these operating instructions which is to be strictly followed.



This product is CE-tested and complies with the necessary directives.

For reasons of safety and licensing (CE) altering or converting this unit yourself is not permitted.

Measuring devices and their accessories are not toys and should be kept away from children!

In commercial institutions, the accident prevention regulations of the relevant professional insurance association for electrical systems and operating materials are to be observed.

In schools, training centres, amateur and self-help workshops, handling of measuring instruments must be supervised by trained personnel in a responsible manner.

Do not switch on the measuring instrument immediately after it has been taken from a cold to a warm environment. The condensated generated as a result could spoil the device. Allow the device to reach room temperature before switching it on.

The supplied durable pH electrode is suitable for soft-muddy media such as planting soils, liquids etc. Stones and other hard foreign particles in the measuring media can damage the electrode. Any application of a deliberate mechanical load, will make the warranty null and void.

## Scope of delivery

PH-212 pH measuring device

Durable pH electrode with Epoxy casing and storage solution

pH4 and pH7 buffer/calibration solutions

Operating instructions

Storage case

To prevent leakage, remove the batteries if the device is not used for longer periods of time.

Leaking or damaged batteries may cause burns if in contact with skin. It is therefore advisable to use suitable protective gloves.

Make sure that the batteries are not short-circuited. Do not throw batteries into fire.

Batteries should not be recharged. Danger of explosion.

## Disposal of used batteries

You, as the end user, are bound by law (**Battery Regulation**) to return used batteries and accumulators; **disposing of them in the household waste is prohibited.**



Batteries and accumulators containing hazardous substances are marked with the symbols shown here, indicating that they must not be disposed of with the household waste.



The heavy metals concerned

are: **Cd** = cadmium, **Hg** = mercury, **Pb** = lead.

You can return flat batteries/rechargeable batteries free of charge to the collection points in your locality, to our branches or anywhere else where batteries are sold.

## Disposal



If the device has reached the end of its operational life, please dispose of it in accordance with the applicable statutory regulations.

## HOLD function

The measured values currently displayed are retained on the display. Press the „HOLD“ button (3) to activate this function. Press again to switch back to the normal measuring mode.

## Maintenance and Cleaning

Contaminations and deposits on the electrode affect the result of measurement. Therefore it is important to keep the electrode always clean. Use only distilled or de-ionised water for cleaning (rinsing) the pH-electrode and paper napkins for dabbing. Do not use detergents that contain carbon, petrol, alcohol or similar substances for cleaning purposes. This will corrode the surface. Moreover the vapours are detrimental to health and explosive. Sharp-edged tools, screw-driver or metal brushes are a taboo for cleaning.

Always store the pH electrode in the provided storage solution. While doing so first put on the end cap on the electrode. Now put on the o-ring on the electrode and screw the end cap to the tin.

## Replacing the battery

If the battery symbol „“ is displayed on the display, the batteries must be replaced as soon as possible to prevent erroneous measurements.

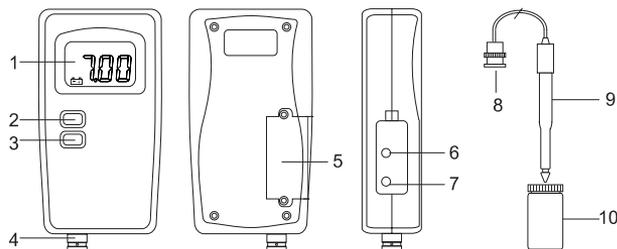
To replace the batteries, proceed as follows:

- Switch off the device.
- Loosen the two battery compartment screws on the back of the device, and slide the lid of the battery compartment (5) out of the housing.
- Replace the run-down battery with a new one of the same type (e.g. 1604A).
- Close the measuring device again carefully in reverse sequence.



Do not leave run-down batteries in the measuring device. Even leak-proof batteries can corrode and thus release chemicals which can be detrimental to your health or damage the appliance.

## Controls and indicators



1. LC display
2. ON/OFF button
3. HOLD button
4. BNC connection electrode socket
5. battery compartment
6. Calibration trimmer pH7
7. Calibration trimmer pH4
8. BNC connecting plug
9. electrode grip
10. electrode storage solution

## Commissioning

### Inserting the batteries

Before the commissioning of this meter, you must first install a new 9 V battery pack. Insertion of battery is described in the „Maintenance and Cleaning“ section.

### Calibration

Calibration is necessary in order to optimally adapt the electrode to the pH meter. An optimal pH electrode outputs a voltage of 0 mV at a temperature of 25°C and a pH value of 7.00. However, since each electrode is different and deviates from the optimum depending upon the temperature and the wear and tear, it must always be adapted to the pH measuring device for achieving the highest possible accuracy.

The PH-212 has a two-point calibration (7.00 and 4.00/10.0) system, can however be adapted only with a single point calibration (7.00) also. Two-point calibration gives better accurate values. If the measuring medium is extremely alkaline or extremely acidic, a two-point calibration is recommended.



#### **Note for calibration!**

It is not necessarily to calibrate the PH-212 before each measurement. It is recommended to carry out calibration before every tenth measurement or every two weeks. Should the supplied buffer/calibration be used up, these can be bought extra.



#### **Note for pH electrode**

The pH electrode must be always be kept wet for obtaining accurate results over a long period. The pH electrode must be always be stored immersed in the storage solution. Should the storage liquid be used up, this can be bought extra.

The pH electrode is a wear and tear part. Worn out electrodes are excluded from the warranty.

### **Two-point calibration**

- Insert the BNC connection plug (8) of the electrode into the BNC female connector (4) and lock it by turning through 90°.
- Remove the pH electrode from the storage solution (10), rinse it well with distilled or de-ionised water and insert it into the provided 7.00 pH buffer/calibration solution.
- Switch on the pH measuring device by pressing the ON/OFF button (2).
- Wait until the display is stabilized and bring the pH value displayed exactly to 7.00 by turning the “pH7” calibration trimmer (6) with a small screwdriver.
- Remove the pH electrode from 7.00 pH buffer/calibration solution, rinse it well with distilled or de-ionised water and insert it into the provided 4.00 pH buffer/calibration solution.

- Wait until the display is stabilized and bring the pH value displayed exactly to 4.00 by turning the “pH4” calibration trimmer (7) with a small screwdriver. The second calibration point can also be performed at pH 10.00, you must however use an appropriate 10 pH buffer/calibration solution (optional).
- Rinse the pH electrode well again with distilled or de-ionised water and check whether the pH 7-value is still correct, by inserting the electrode into the provided 7.00 pH buffer/calibration solution. Repeat the calibration processes until both values are optimally matched to the buffer/calibration solutions.

### **Single-point calibration**

- Insert the BNC connection plug (8) of the electrode into the BNC female connector (4) and lock it by turning through 90°.
- Remove the pH electrode from the storage solution (10), rinse it well with distilled or de-ionised water and insert it into the provided 7.00 pH buffer/calibration solution.
- Switch on the pH measuring device by pressing the ON/OFF button (2).
- Wait until the display is stabilized and bring the pH value displayed exactly to 7.00 by turning the “pH7” calibration trimmer (6) with a small screwdriver.

### **Carrying out measurements**

- Remove the pH electrode from the storage solution, rinse it with distilled or de-ionised water and wipe it dry.
- Immerse the pH electrode into the medium, the pH of which has to be measured. After the display stabilizes the pH value of the liquid can be read directly. The automatic temperature compensation (ATC) always provides an accurate value even at different temperatures. It is however recommended to carry out calibration for temperatures outside 15 to 35°C.
- In order to ensure a long life-span of the device, the pH electrode must be cleaned after each measurement (see Maintenance and Cleaning)