

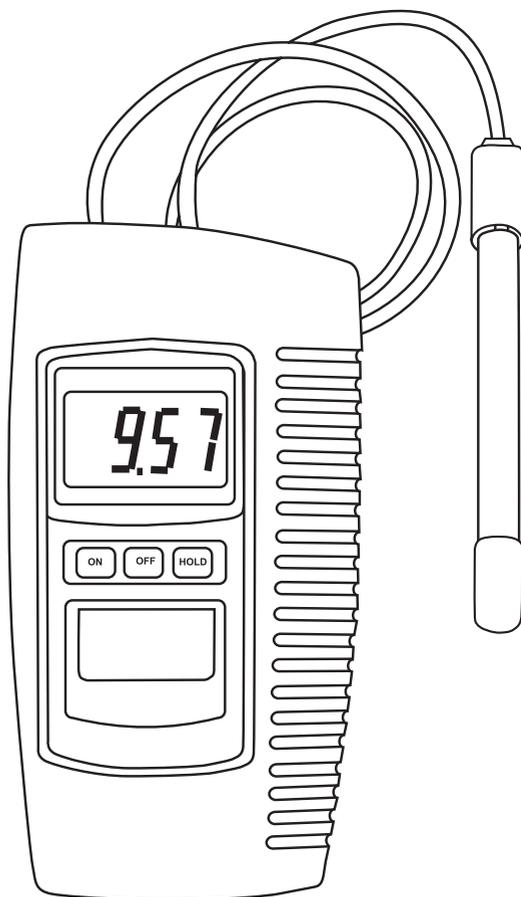
# Lovibond® Water Testing

Tintometer® Group



## SensoDirect pH110

pH - Instruction Manual



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### **1. GENERAL DESCRIPTION**

- \* General purpose pH meter with broad application including AQUARIA & FISH HATCHERIES, FOOD & BEVERAGE PROCESSING, PHOTOGRAPHY, LABORATORY, QUALITY CONTROL, EDUCATION, SWIMMING POOLS & WATER CONDITIONING
- \* High quality, compact unit that is designed for easy operation
- \* Water resistant front panel with easy to read LCD display and rubberised function keys

### **Unpacking**

Please check that the shipment includes the following items:

- Lovibond® SensoDirect pH110
- Lovibond® SensoDirect pH sensor plastic/gel-type with BNC plug
- 9V Battery
- Protective cover
- 7 Screws
- Screwdriver
- Plastic Cover Calibration Screws
- Instruction Manual

### **Battery installation**

Prior to first use take the instrument out of the protective cover open the battery compartment and insert the 9V battery.

Ensure polarity is correct.

## Protective Cover

The instrument is equipped as standard with the protective cover.

Prior to the first measurement please fix the cover by using the enclosed screws. The protective armouring ensures reliable operation even in harsh environments.

When the instrument is used without the protective cover please use the enclosed plastic cover to protect the calibration screws against dust and humidity.

## 2. SPECIFICATION

<b>Display</b>	LCD, 21.5 mm (0.7") digit height
<b>Measurement Range</b>	0 - 14 pH
<b>Resolution</b>	0.01 pH
<b>Accuracy</b>	$\pm 0.07$ pH (pH 5 - pH 9) $\pm 0.1$ pH (pH 4 - pH 10) $\pm 0.2$ pH (pH 1 - pH 3.9, pH 10.1 - pH 13) Main instrument only $23 \pm 5^\circ\text{C}$ , after calibration
<b>Input Impedance</b>	$10^{12}$ Ohms
<b>Temperature Compensation</b>	No adjustment
<b>Sample Time</b>	Approx. 0.4 seconds
<b>Operating Temperature</b>	0 - 50°C (32 - 122°F)
<b>Operating Humidity</b>	Maximum 80% relative humidity
<b>Calibration</b>	External, pH 4.0 (slope adjustment) & pH 7.0 (Cal. adjustment)
<b>Power Supply</b>	006P DC 9V battery
<b>Power Consumption</b>	Approx. 2.0 mA
<b>Dimension</b>	208 x 110 x 34 mm (L x W x H)
<b>Weight</b>	Approx. 380 g
<b>pH electrode</b>	pH plastic type, gel electrolyte with BNC connector

### 3. FUNCTIONAL DESCRIPTION

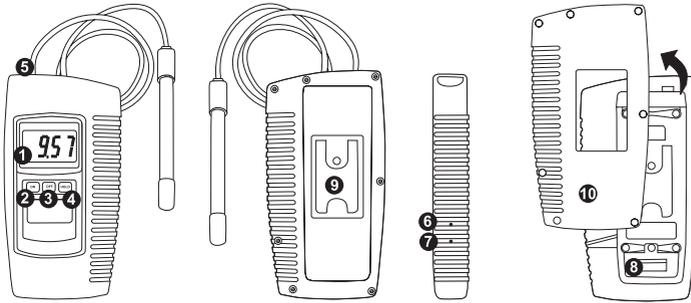
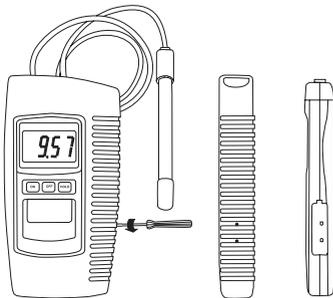


Figure 1

- 1 Display
- 2 Power ON Button
- 3 Power OFF Button
- 4 Data Hold Button
- 5 BNC socket for pH electrode
- 6 Calibration pH 7 Adjust
- 7 Slope pH 4 pH10 Adjust
- 8 Battery compartment/cover
- 9 Stand
- 10 Protective cover

### 4. CALIBRATION



#### 4-1 Overview

The meter is supplied with calibration by mV signal that simulates an ideal pH electrode mV output (0 mV at pH 7, based on 25°C working temperature). However, because most pH electrodes do not exactly replicate the ideal electrode and because the working temperature may differ from 25°C, it is necessary to calibrate the instrument to ensure measurement accuracy of the combined pH electrode.

#### 4-2 Equipment Required

- i) Combination pH electrode
- ii) pH 4.0 & pH 7.0 buffer solutions

#### 4-3 Two Point Calibration

- i) Connect the pH electrode to the BNC socket (Figure 1, 5) and immerse in pH 7.0 buffer solution.
- ii) Switch the instrument on by pressing the Power ON Button (Figure 1, 2).
- iii) Adjust „pH 7 Adjust „ (Figure 1, 6) until the display reads exactly pH 7.0.
- iv) Rinse the electrode in distilled water.
- v) Place the electrode into buffer pH 4.0 solution.
- vi) Adjust „pH 4 Adjust „ (Figure 1, 7) until the display reads exactly pH 4.0.
- vii) Rinse the electrode in distilled water.
- viii) Repeat steps iii) to vii) at least twice.

#### 4-4 Single Point Calibration

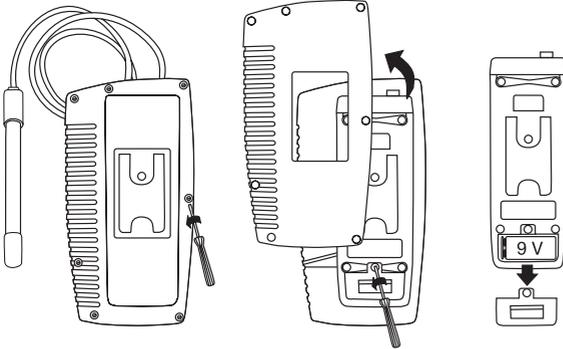
- i) Connect the pH electrode to the BNC socket and immerse in a standard buffer solution (eg pH 7.0 or higher if available).
- ii) Switch the instrument on by pressing the Power ON Button (Figure 1, 2).
- iii) Adjust the „pH 7 Adjust „ (Figure 1, 7) until the display reads the same value as the standard buffer solution used.

### 5. TAKING MEASUREMENTS

After calibration, the unit is ready for taking measurements.

- i) Connect the pH electrode to the BNC socket.
- ii) Switch the instrument on by pressing the Power ON Button.
- iii) Immerse the electrode in the solution being measured; the instrument will display the pH value.
- iv) During measurement, pressing the Data Hold Button (Figure 1, 4) will freeze the display. At the same time the display will show a Data Hold indicator. To release the display freeze function, press the Data. Hold Button again; the Data Hold indicator will disappear from the display.
- v) After taking a measurement, rinse the electrode in distilled water.

## 6. CHANGING THE BATTERY



- i) „“ in the left corner of the display indicates that it is necessary to replace the battery. However, accurate measurements may still be made for several hours after the Low Battery” indicator first appears.
- ii) Remove the protective cover before replacing the battery. To replace the battery, remove the Battery Compartment Cover (Figure 1, 9) on the rear of the meter.
- iii) Remove the battery, install a replacement one (006P DC 9V) and replace the battery compartment cover.

## 7. ACCESSORIES

721330 pH Electrode, plastic type, gel electrolyte with BNC connector

721247 pH Buffer Solution pH 4 (25°C) red, 90 mL, traceable to N.I.S.T.

721248 pH Buffer Solution pH 7 (25°C) red, 90 mL, traceable to N.I.S.T.

721249 pH Buffer Solution pH 10 (25°C) red, 90 mL, traceable to N.I.S.T.

## 8. IMPORTANT INFORMATION FOR pH ELECTRODES

### General information:

Non-refillable gel electrodes are wear parts. The service life and the measurement accuracy depend significantly on application, storage and maintenance. Improper storage as well as special samples with e.g. aggressive chemicals, high contamination potential and high temperatures can reduce the service life to few months or even weeks. Samples with low conductivity (very low salinity) extend the response time of electrodes. Electrodes are subjected to a natural ageing effect, which induces shift of the offset point and gradient of the electrode. For slowing down the ageing effect and for maintaining the performance and accuracy, please note the following considerations:

**Storage:**

Never store electrodes in distilled water!

- Short-term storage (few hours): in tap water
- Medium-term storage (some days): in pH 4 buffer solution
- Longer-term storage: in 3 M KCl solution

In case of drying out (KCl solution is crystallized), please store the electrode for minimum 5 hours in 3 M KCl solution (order code 2418609) or tap water in such a way that water covers the glass part completely. Afterwards, the electrode has to be stored in 3 M KCl solution.

**Handling of measurement and calibration**

1. Prior to each immersion into sample or buffer solution please rinse the electrode with distilled water/tap water for removal of possible residues of salt and to minimize carryover effects.
2. In case of air bubbles, remove them by shaking.
3. During measurement/calibration, a flow rate is necessary (water flow/slewing of the electrode).
4. After each use, the electrode shall be rinsed with distilled water/tap water and covered by a destined cap (filled with KCl solution).

**Cleaning:**

For longer service life, electrodes shall be cleaned as following:

- Water soluble contaminations: distilled water (tap water)
- Chalk and hydroxide deposits: Hydrochloric acid (10 %)
- Fats and oils: Warm water and mild detergents (dishwashing detergent)

Attention: Do not use petroleum, ether or similar chemicals for plastic-covered electrodes.

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