pH Sensor 1000556

Instruction sheet

10/15 WH

1. Safety instructions

In order to prevent permanent damage to the pH-electrode supplied, it is to be stored exclusively in the storage solution supplied (pH 4.00/ KCl)!

- Avoid contamination with the following:

  Organic lubricants

  Artificial resins, macromolecular hydrocarbons

  Protein deposits

  Dyes

  Cleaning agents n aqueous solution

  Dlute hydrochloric acid

  Alcchols, acetone, ether

  Acdic fermentinglutions

  Aqueous hypochlorite solutions

  Solutions with perchlorate, silver and sulphur ions
- Do not let the electrode body come into contact with organic silicone.
- Store the electrode exclusively at temperatures between +10°C and +35°C

2. Description

The sensor box including the pH-electrode measures pH-values in aqueous solutions.

A storage solution – NOT a buffer solution – is included in the scope of delivery

The sensor box is automatically detected by the 3B NET*log*™ unit.

3. Scope of delivery

1 Sensor box

1 pH-electrode

2 Plastic pipettes 1 ml

1 Mini DIN connecting lead 8-pin, 60 cm length

4. Technical data

Measurement range:	pH 0 to pH 14
pH at zero voltage:	pH 7.00 ± 0.25
Sensor type:	Ag-AgCl combination electrode, gel-filled, non-refillable
Accuracy:	pH 0.05 in the range from 20°C to 25°C
Resolution:	pH 0.01
Reaction time:	≤ 1 s for 95% of final value

5. Operation

- Remove storage bottle from the electrode by twisting off the lid, then pull the lid off the electrode.
- Rinse the lower end in the vicinity of the glass bulb thoroughly with distilled water, shake off remaining water and dry with filter paper.
- Move air bubbles in the lower part of the electrode chamber into the upper part by cautiously shaking them downward.
- Calibrate the electrode. For the procedure, see section 6 “Calibration”.
- Subsequently, rinse with distilled water, shake off remaining water and dry with filter paper.
- Conduct measurement.
- After finalising the measurement, rinse the electrode with distilled water and repeat the same procedure as before the measurement.
- Slide the lid on the electrode and tighten it to the storage bottle.

6. Calibration

- Connect the electrode to the sensor box, and connect the sensor box to **analog input A** of the 3B NET*log*™ unit, analog input B is suitable for pH-measurement but not for calibration!
- Wait for the “Probe Detect” function to detect the sensor.
- Press the (Date/Time ↵) key **4 times** until “User Calibration” appears in the display.
- Start calibration by pressing the (Store ↓) key.
- Immerse the electrode (after rinsing) in the alkaline “pH 9.00 buffer solution”.
- Move the decimal points in the display of the (SET 1) with the (Channel ←) key towards the left or with the (Date/Time ↵) key to the right, respectively.
- Increase the displayed value with the (Rate ↑) key, or decrease it with the (Store ↓) key, respectively.
- Set the displayed value to +9.000e+00 and press (Date/Time ↵).
- Wait for the correction of the measured value, press (→ ACCEPT) and validate with the (Date/Time ↵) key.
- Remove the electrode from the “pH 9.00 buffer solution”, rinse and dry thoroughly, and immerse in the “pH 4.00 storage solution”.
- Repeat the procedure described above for (SET 2).
- Wait for the “Probe Detect” function to detect the sensor then conduct the desired measurements.

7. Cleaning the electrode

- After prolonged periods of use, clean the electrode for 1 to 2 minutes in dilute hydrochloric acid HCl (0.1 mol), then rinse with distilled water and rejuvenate in potassium chloride KCl (4 mol).

8. Use in experiments

Measurement of common household acids and alkalis

Acid-base titrations

Observation of pH changes in chemical reactions

Testing the influence of photosynthesis on water quality in aquaria

Examining the influence of acid rain and its neutralisation

Water quality of rivers and lakes

9. Sample experiment

9.1 Qualitative determination of the titration curve of vinegar

Required equipment:

1 3B NET*log*™ @ 230 V	1000540
or	
1 3B NET*log*™ @ 115 V	1000539
1 3B NET*lab*™	1000544
1 pH Sensor	1000556
1 Measuring cylinder, 100 ml	1002870

Household vinegar pH 2.00

Highly dilute sodium hydroxide pH < 14.00

- Pour 20 ml of the diluted (1:10) household vinegar into the beaker.
- Immerse the pH-electrode (after thorough cleaning) in the vinegar solution, all the way to the bottom of the beaker.
- Select the analogue input A on the 3B NET*log*™ and activate the experiment (template) for the determination of titration curves in the 3B NET*lab*™ software; here, all necessary output adjustments can be found.
- Conduct and analyse the experiment.

Fig. 1: Qualitative determination of the titration curve of vinegar

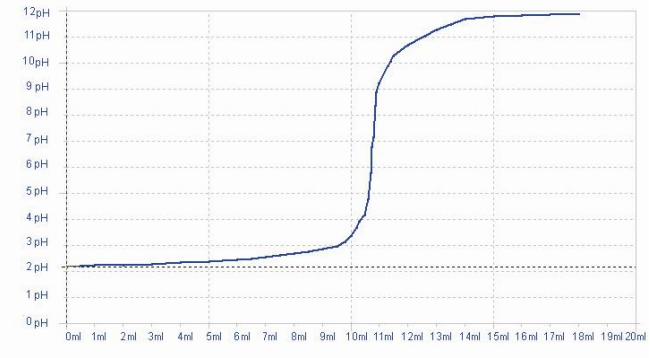

Fig.2: Titration of a vinegar solution and sodium hydroxide NaOH