![Metrohm]

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1   pH glass electrodes

1.1   General

Immediately after receiving the electrode, check to make sure that it works properly. Electrodes that do not work properly must be sent back for warranty processing within two months (starting from the day of delivery). If the defect is proven to be due to a material or manufacturing defect, the electrode will be replaced at no charge. The transport costs are to the customer's account.

1.1.1   Electrodes with flexible ground-joint diaphragm

Double-junction electrode: The electrode is delivered with KCl 3 mol/L as reference and bridge electrolyte. If you need a chloride-free bridge electrolyte (to be filled into the ""OUTER FILLING" opening), we recommend KNO_3 1 mol/L. Loosen the ground-joint diaphragm from time to time to ensure a flow of electrolyte solution.

1.1.2   Electrodes with built-in temperature sensor

Always plug the B plugs of the built-in temperature sensor into the temperature sensor connection sockets of the pH meter. If you are using a pH meter with only one temperature sensor connection socket, connect one of the B plugs to the connection socket for the reference electrode. Temperature sensor plugs that are not plugged in result in interfering signals.

1.2   Measuring

> ⚠ **CAUTION**
>
> Do not use the ultrasonic bath for electrodes, as they may be damaged by such a treatment.

1.2.1 Combined electrodes

Open the closure of the filler opening (**2**) and fill reference electrolyte up to the filler opening.

1.2.2 Separate pH glass electrodes

When measuring in nonaqueous media, soak the electrode in water between measurements as often as possible.

1.2.3 Difficult sample matrix

Solutions containing proteins: Immerse the electrode in a solution of pepsin and hydrochloric acid (1% pepsin in HCl 0.1 mol/L) for several hours. Afterwards, thoroughly rinse the electrode.

Low-ion solutions: Use the Aquatrode Plus.

Solutions containing sulfide: A black precipitate of silver sulfide may accumulate in the diaphragm. In this case, treat the electrode with freshly prepared 7% solution of thiourea in HCl 0.1 mol/L.

Nonaqueous solutions: Use the Solvotrode.

Solutions containing solids: Use the Unitrode.

Solutions with ClO_4^-: Use a double-junction electrode with a potassium-free bridge electrolyte, e.g. NaCl ($KClO_4$ is sparingly soluble and may block the diaphragm).

Solutions containing substances poisoning the electrode, such as hydrogen peroxide or formaldehyde: Use a double-junction electrode and, more importantly, replace the bridge electrolyte more frequently to prevent contact between the poison and the inner reference system.

1.3 Storage

1.3.1 Combined electrodes

pH glass electrodes with KCl 3 mol/L as reference electrolyte should be stored in the 6.2323.000 storage solution. This solution prevents ageing of the glass membrane, i.e., the response time of the electrode is unchanged even after long-term storage. The electrode can be used immediately without conditioning.

pH glass electrodes filled with another reference electrolyte should be stored in that reference electrolyte in order to ensure that the electrode is ready for immediate use.

Immerse the electrode in the corresponding solution deep enough to cover the diaphragm (**1**) and close the filler opening. Do not store the electrode dry.

1.3.2 Separate pH glass electrodes

Separate pH glass electrodes require a separate reference electrode. Store the electrodes in distilled water. Do not store the electrode dry.

1.3.3 iTrode models

The memory chip integrated in the electrode head (**3**) enables the storage of important sensor data such as article number, serial number, calibration data and calibration history.

When the electrode is not in use, screw the protective cap (**4**) onto the electrode head to prevent contamination (water, solvent, dust, etc.) of the electrode head as well as exposure of the contact pins.

1.4 Troubleshooting

Air bubbles in the electrolyte: Remove air bubbles by lightly flinging the electrode downward.

Sluggish measured value setting, slope too small (< 96%): Treat the diaphragm (**1**) as described in *Chapter 1.2.3*.

Contaminated or dried-in reference electrolyte: Remove the electrolyte by loosening the flexible ground-joint diaphragm or, for other diaphragms, using a syringe or a Pasteur pipette and replace with fresh electrolyte. Repeat this procedure, if necessary.