User maintenance and troubleshooting

Symptom	Possible cause	Remedy
Drift	Junction blocked	Clean junction
	Sensor tip not clean	Clean glass membrane
	Membrane aged/ damaged	Allow longer measuring time or replace
	Temperature changes	Stabilise temperature
Noisy	Bubble in membrane	Flick electrode downward
	Poor connection	Check connections
	Junction not immersed fully	Lower electrode into solution below junction
	Insufficient electrolyte	Refill electrolyte
Low Slope (<95%)	Contaminated buffers	Replace buffers
	Membrane not clean	Clean membrane
	Membrane aged	Allow more time for stabilisation, or replace
	Electrode polarised	Isolate sample electrically
Slow Response	Membrane not clean	Clean membrane
	Membrane aged	Allow more time for stabilisation, or replace
Incorrect Reading after Cal	Junction blocked or unclean	Clean junction
Reads pH7 all Buffers	Electrical short	Check connector
	Internal short	Replace electrode
Reads pH4-5 all Buffers	Membrane or stem cracked	Replace electrode
Large Offset (>0.5pH)	Insufficient sleeve electrolyte	Refill electrolyte
	Junction blocked/ unclean	Clean junction
	Electrode polarised	Isolate sample electrically

Warranty

Any electrode found to be faulty due to manufacture will be replaced. Ionode electrodes have a warranty of 12 months from date of purchase; however we reserve the right to void warranty if the electrode has been used in an unsuitable application. Please visit our web site to register your electrode as soon as you receive your electrode.
Electrode life will be reduced in chemically aggressive or abrasive samples, and at high temperatures.
Electrodes with broken glass stems or damaged connectors and/or cables will not covered by warranty.

Parameter	Operating Range
pH range	0-14 pH (C glass) 0-12 pH (A glass)
Zero Potential Point	pH 7.0 ± 0.5
Electrode slope	> 95% when new
Temperature Range	0 – 60°C
Reference Type	Sealed Gel Ag/AgCl
Cable Length	1m standard, longer to order. Max length 20m
Connector	BNC standard, others on request

Sealed Gel pH Electrodes

Short-Form

Operators Manual

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Introduction

pH is a measure of acidity and alkalinity and is defined as:

pH = -log hydrogen ion activity

For most aqueous solutions, the pH scale covers a range between 0 to 14; 0 being strongly acidic and 14 being strongly alkaline. A pH of 7 is neutral.

The pH electrode consists of a pH sensitive glass membrane attached to a sealed insulating glass stem. This contains a solution of fixed pH in contact with a silver/silver chloride wire. The potential developed across the membrane is compared to a stable reference potential consisting of a silver/silver chloride gelled chloride half cell. Completion of the circuit is accomplished by solution contact between the reference half cell electrolyte and the sample via a porous wick.

Preparation

The electrodes are shipped pre-filled with electrolyte and are ready for use after removal of the wetting cap. Remove the wetting cap by gently easing it off the electrode.
Retain the wetting cap as it can be used for storage of the electrode when not in use.

pH Electrode Calibration

1. Consult the meter instruction manual for meter setup. Connect the electrode (and temperature sensor if applicable), rinse the electrode with distilled water and blot dry.
2. Immerse the electrode in the first pH buffer (usually 6.86 or 7.00), and wait for stable reading. The expected mV reading for pH 7 buffer at 25°C should be between 0±30mV.
3. Rinse the electrode with distilled water and blot dry, before immersing into the second pH buffer (usually 4.00) and wait for a stable reading. If the electrode is performing correctly, the mV difference between the values of the pH7 and pH4 buffers should be at least 166mV (at 25°C).
4. Check your pH calibration by remeasuring the pH 7 buffer. Repeat calibration if necessary.

Helpful Hints

- Try to calibrate and measure at the same temperature (within ±5°C or better).
- Calibrate periodically; frequency will depend on the desired accuracy, and use fresh buffers.
- Keep electrode and meter connections dry at all times.
- Use a dedicated high impedance pH meter (do not use multimeters as you may damage the electrode).
- Immerse the electrode so that the reference junction (wick) is completely immersed.
- Do not allow the electrode to come in contact with solutions containing sulphide, or high levels of oils, greases and solids.

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Maintenance

When not in use, keep the electrode immersed in 20% KCl solution (the wetting cap can be used for this).

Cleaning

Cleanliness of the sensor and junction is critical for accurate measurement. Drift, poor slope and slow response are often due to an unclean sensor or junction. DO NOT use abrasive materials. The IH40 is supplied with a white cleaning tool.
It can be used instead of the tissue/cotton detailed below. Simply put some of the cleaning agent in the tool and use this to clean the membrane.

To remove inorganic deposits and scale:
Soak membrane in dilute HCl for an hour. Wash well with water and condition in 20% KCl solution before use.

To remove solids and organics:
Wipe the membrane with cotton or tissue soaked in mild non-alkaline detergent. Wash with water and condition in 20% KCl before use.

To remove strongly adsorbed and chemically bonded impurities:
Use a non-abrasive cleaner such as Jif™ undiluted on a soft cloth. Clean the pH membrane, rinse with water and condition in 20% KCl before use. In the case of protein contamination use 5% Pepsin in 0.1M HCl solution.