

## User maintenance and troubleshooting

Symptom	Possible cause	Remedy
Drift	Junction blocked	Remove sleeve. Clean glass stem and sleeve
	Membrane dirty	Remove sleeve. Clean glass membrane
	Membrane aged/damaged	Allow longer measuring time or replace
	Temperature changes	Stabilise temperature
Noisy	Bubble in membrane	Flick electrode tip downward (see step 4)
	Poor connection	Check connection
	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 electronically
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. IJ electrodes have a warranty of six months from date of purchase, however we reserve the right to void warranty if the electrode has been used in an unsuitable application. IJ electrodes will have an expected lifetime of two to four years in ideal samples at room temperature. This will be reduced in chemically aggressive or abrasive samples, and at high temperatures.

Parameter	Operating Range
pH range	0-14 pH
Zero potential point	pH 7.0 +/- 0.5
Temperature range	0-100°C
Reference type	Double junction Ag/AgCl/sat KCl
Body and sleeve	Kynar
Overall length	150mm
Barrel diameter	12mm
Cable length	1m standard, longer to order. Maximum 20m
Connector	BNC standard, others on request

All specifications and values are subject to change without notice.

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TPS PTY LTD  
 Unit 1, 8 Bult Drive  
 Brendale QLD 4500 Australia  
 Ph: 07 3205 8207  
 Email: sales@tps.com.au



## Intermediate Junction Series Operator's Manual

## High Temperature IJ pH electrodes



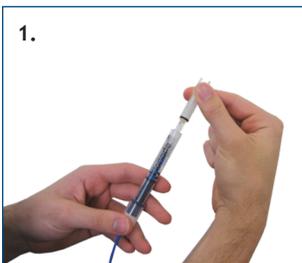
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## Introduction

This guide contains the basic information for proper use of your new IJ pH electrode.

## Preparation

IJ electrodes are shipped without sleeve electrolyte, and must be filled prior to use. To fill, hold the electrode by the sleeve and gently ease off the rubber wetting cap. Prepare as follows:



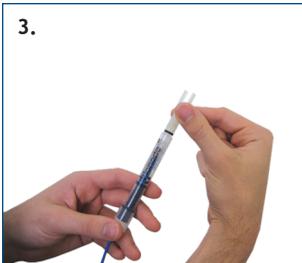
1.

1. Invert the electrode. Hold the electrode just below the sleeve and with careful rotation and pulling along the axis of the electrode, remove the sleeve. DO NOT BEND.



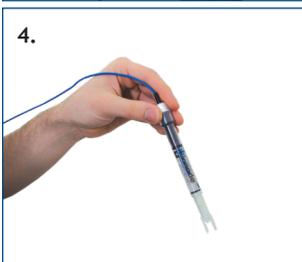
2.

2. Fill the annular space with gel or electrolyte to approximately half- to three-quarters full.



3.

3. Slide the sleeve back onto the electrode ensuring the black O-ring is well seated within the electrode body. Do not exert sideways force. Any excess electrolyte will be expelled from the end of the electrode through the ground junction. Ensure there are no air bubbles in the sleeve.



4.

4. With the pH bulb facing downwards, gently flick the electrode to remove any bubbles from within the membrane. Wash off any excess electrolyte and store in 2-3M KCl before use.

## Calibration

- Turn on the pH meter and connect the pH electrode and temperature sensor (if available).
- Remove the wetting cap from the electrode and rinse the electrode with distilled water.
- Perform a calibration by immersing the electrode in the first pH buffer (pH 7.0 or 6.86), and stir. Adjust the reading when stable.
- Rinse the electrode and repeat the process with the second pH buffer (usually pH 4.01 or 10.01).
- To check the calibration, recheck the first buffer value - the reading should be within +/- 0.02 pH of the buffer value. If not, repeat the calibration.
- Rinse the electrode with distilled water or portions of the sample to be measured.
- Buffers values should bracket the sample pH.

## Helpful Hints

- Use the same technique during calibration and sample measurements (including stirring rates).
- Try to ensure that the pH buffers and the samples are at the same temperature (within +/- 5°C or better).
- Calibrate regularly and always use fresh buffers.
- Keep all connections dry.
- Immerse the electrode so that the reference junction is below the surface.
- Do not use in fluoride solutions of low pH, as this will damage the glass membrane.
- Minimise contact with sulphide vapours and change the sleeve electrolyte frequently in these conditions.

## Maintenance

- When not in use (short term storage) keep the electrode immersed in 2-3M KCl storage solution to stabilise junction potentials.
- pH membranes are NOT damaged if allowed to dry. Sensor pH glass usually rehydrates in under one hour.
- Replace sleeve electrolyte when necessary. The frequency of this is best determined by experience, however this should be done more often when measuring contaminated samples.

- For long-term storage, remove and clean the sleeve. Replace the sleeve (without electrolyte) and attach the wetting cap.
- DO NOT store the electrode in de ionised or distilled water.

## 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/junction. Clean the electrode periodically. Remove the sleeve and clean the membrane, ground glass stem and sleeve using one of the following methods. Do not use abrasive materials.

### Method one: alkaline samples and scale

Soak membrane in 1M HCl for an hour. Wash well with water and condition in 20% KCl before use.

### Method two: grease and oil

Wipe the membrane and ground stem with cotton or tissue soaked in acetone followed by methylated spirits. Wash with distilled water before use.

### Method three: solids and organics

Wipe the membrane and junction with cotton or tissue soaked in a mild non-alkaline detergent. Wash with distilled water and condition in 20% KCl before use.

### Method four: strongly absorbed and chemically bonded impurities

Remove with non-abrasive cleaner such as Jif™. Use undiluted on a soft cloth and scrub the membrane well. Wash well with water and condition in 20% KCl before use.

### Method five: protein contamination

Soak electrode in 1% pepsin solution in 0.1M HCl for 15 minutes, followed by rinsing with distilled water. Finally, condition in 20% KCl before use.