

User maintenance and troubleshooting

Symptom	Possible cause	Remedy
Drift	Junction blocked	Remove and clean sleeve
	Membrane unclean or contaminated	Remove sleeve. Gently polish membrane with P1200 "Wet & Dry"
Noisy	Poor connection to meter	Check connection
	Junction not immersed fully	Lower electrode into solution below junction
	Insufficient electrolyte or bubble	Refill electrolyte
Inaccurate readings or poor reproducibility	Contaminated standard(s)	Make up fresh calibration standards and recalibrate
	Improperly made standards	Recalibrate using freshly made standards
	Contamination from electrolyte	Use 1M potassium nitrate in sleeve
	Temperature differences between calibration and sample measurement	Ensure calibration and sample measurements are done at the same temperature
	No ISA used	Add ISA
	Sensitivity to light	Perform calibration and measurements in dark beakers or away from bright light

Warranty

IJ electrodes have a warranty of 12 months from date of purchase. Any electrode found to be faulty due to manufacture within this time will be replaced.

Ionode reserves the right to limit or modify product warranty if it is deemed that the electrode has been used in unsuitable applications. Electrodes with broken stems, connectors or cables are not covered by warranty.

Electrode life may be reduced in chemically aggressive or abrasive samples and at high temperatures.

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Parameter	Operating Range
Concentration range	1.8 to 35,000 mg/L
Temperature range	0 – 60°C
pH range	2-14 pH
Reference Type	Double Junction Ag/AgCl/refillable
Sensor materials	Polycrystalline solid state membrane
Body and sleeve	Polypropylene/PEEK
Overall length	150mm
Barrel diameter	12mm
Cable length	1m standard, longer to order. Maximum 20m
Connector	BNC standard, others on request

Operators Manual

Short-Form

Intermediate Junction Series

IJ-Cl

CHLORIDE ION SELECTIVE ELECTRODE





Introduction

This guide contains the basic information for proper use of your Chloride Ion-selective electrode.

Preparation

IJ series 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. 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. Fill the annular space with electrolyte to approximately half to three quarter full. 1M potassium nitrate is normally recommended.



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. Wash off any excess electrolyte before use.

Application

The IJ-Cl Ion selective electrode responds reversibly to Chloride and Silver ions. The limit of detection is $2 \times 10^{-5} \text{M Cl}^-$. Use known addition for $[\text{Cl}^-] > 0.1 \text{M}$. Try to avoid exposure of the electrode to direct sunlight, and avoid use in strong reducing agents.

Interfering Ions

Max. ratio of interfering ions/ chloride ion as follows:

Hydroxide	80
Ammonium	0.1
Thiosulphate	1×10^{-2}
Bromide	3×10^{-3}
Iodide	5×10^{-7}
Cyanide	2×10^{-7}
Sulphide	Must be absent

Cleaning

If the membrane is poisoned by interferences, the surface may be renewed by careful polishing with fine wet-and-dry (P1200 grade). The electrode surface should appear grey or purple-grey with waxy lustre. Always inspect the membrane before use, and clean if necessary. Organic contaminants can be removed with ethanol. **DO NOT** use the electrode in chlorinated hydrocarbons. Routinely remove the sleeve and replace the potassium nitrate electrolyte.

Electrolyte Replacement

The IJ-Cl has an inbuilt double junction Ag/AgCl with a replaceable sleeve electrolyte. 1M potassium nitrate is suitable for most applications. Please consult Ionode Customer Service if you wish to use a different sleeve electrolyte.

Calibration Standards

Standard solutions of Chloride Ion should preferably bracket the expected measurement range.

The need for ISA (Ionic Strength Adjuster)

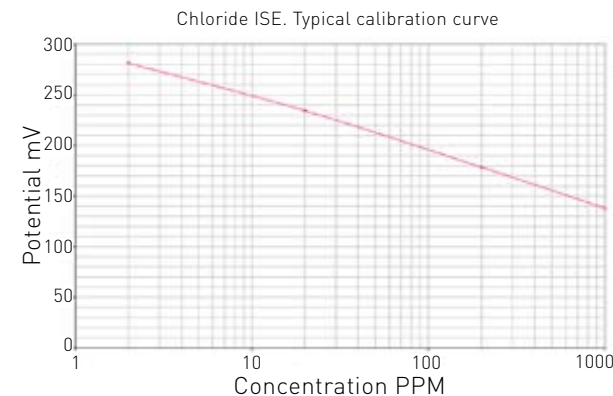
It is important to use ISA, so that the Ionic Strength of standards and samples is independent of the concentration of the Chloride Ion. A suitable ISA is potassium nitrate, which is added to both standards and samples.

As a guide, add 5ml 1M potassium nitrate to every 50ml of calibration standard or sample.

Calibration Procedure

With your meter set on mV (or on concentration on Ion Meters), calibrate by immersing the electrode in a stirred calibration standard (with added ISA), starting with the lowest concentration first. Wait for stability, note the potential in mV, and then carefully rinse and blot dry the electrode before repeating with the next highest standard, until all the calibration standards have been measured.

When using meters that do not have direct concentration readouts, record the data and graph the potential against log of the Chloride Ion Concentration. The graph should have a slope of approximately -55mV/decade of concentration at 25C.



Sample Measurement

Follow the same basic procedures as calibration, substituting the calibration standard for your sample. It is important to use the same stirring conditions, temperature, etc for best results. Use the same ratio of sample/ISA as used in the calibration step. Read off the concentration from the graph or directly from Ion meters.