

## 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 fine polishing agent  |
| 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  |
|   | Drift since last calibration  | Recalibrate using freshly prepared standards   |
|   | Improperly made standards   | Recalibrate using freshly made standards   |
|   | Temperature differences between calibration and sample measurement      | Ensure calibration and sample measurements are done at the same temperature                                |
|   | No TISAB used   | Add TISAB buffer   |
|   | Incorrect pH  | Ensure pH is between 5 - 7   |
|   | Variations in measurement procedure between calibration and measurement | Ensure stirring rates, temperature, and other conditions are the same in calibration and measurement steps |

## 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.

All specifications and values are subject to change without notice. © 2012  
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| Parameter           | Operating Range                              |
|---------------------|--|
| Concentration range | 0.02 to 19,000 mg/L                          |
| Temperature range   | 0 - 60°C                                     |
| pH range            | 5 - 7 pH                                     |
| Reference type      | Double Junction Ag/AgCl/refillable           |
| Sensor materials    | Solid state crystal                          |
| Body and sleeve     | Polypropylene/PMMA                           |
| Overall length      | 150mm  |
| Barrel diameter     | 12mm   |
| Cable length        | 1m standard, longer to order.<br>Maximum 20m |
| Connector           | BNC standard, others on request              |

## Operators Manual

Short-Form

## Intermediate Junction Series

# IJ-F

**FLUORIDE  
ION SELECTIVE  
ELECTRODE**





## Introduction

This guide contains the basic information for proper use of your new Fluoride 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 gel or electrolyte to approximately half to three quarter full.



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-F Ion selective electrode responds reversibly to Fluoride ions. The limit of detection is 0.02 ppm F<sup>-</sup>. The response is theoretical down to approximately 0.2 ppm

## Interfering Ions

The major interference is OH<sup>-</sup>. For best results, ensure measurement is done in the pH range of 5 –7 pH (optimally 5.2-5.5pH). In common applications such as drinking water analysis, this is easily achieved with the use of Tisab (Total Ionic Strength Adjuster Buffer).

## Cleaning

If the membrane is poisoned by interferences, the surface may be carefully polishing with a fine polishing agent such as 3 $\mu$ m diamond paste. Polishing the membrane gently with fluoridated toothpaste can also restore sensitivity. Organic contaminants can be removed with ethanol. **DO NOT** use the electrode in chlorinated hydrocarbons. Routinely remove the sleeve and replace the potassium chloride electrolyte.

## Electrolyte Replacement

The IJ-F has an inbuilt double junction Ag/AgCl with a replaceable sleeve electrolyte. Saturated potassium chloride is suitable for most applications.

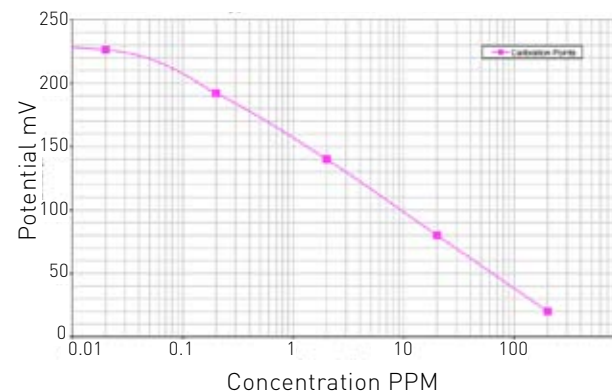
## Calibration Standards

Standard solutions of Fluoride Ion should preferably bracket the expected measurement range. For example, to determine Fluoride ions in drinking water (expected value around 1 ppm), it is normally sufficient to calibrate with 0.2 and 2.0 ppm Fluoride standards.

## Calibration Procedure

Make up F<sup>-</sup> calibration standards in distilled water bracketing the expected measurement range. Starting with the lowest concentration first, measure out 20ml of standard and add 20ml Tisab. Insert the electrode after rinsing, stir, and note the potential in mV. Perform this (carefully rinse between measurements to eliminate carry over) on each of the standards. At room temperature, a slope should be obtained of around -55mV/decade. (from 0.2ppm upwards)

## Typical Calibration Curve



## 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.