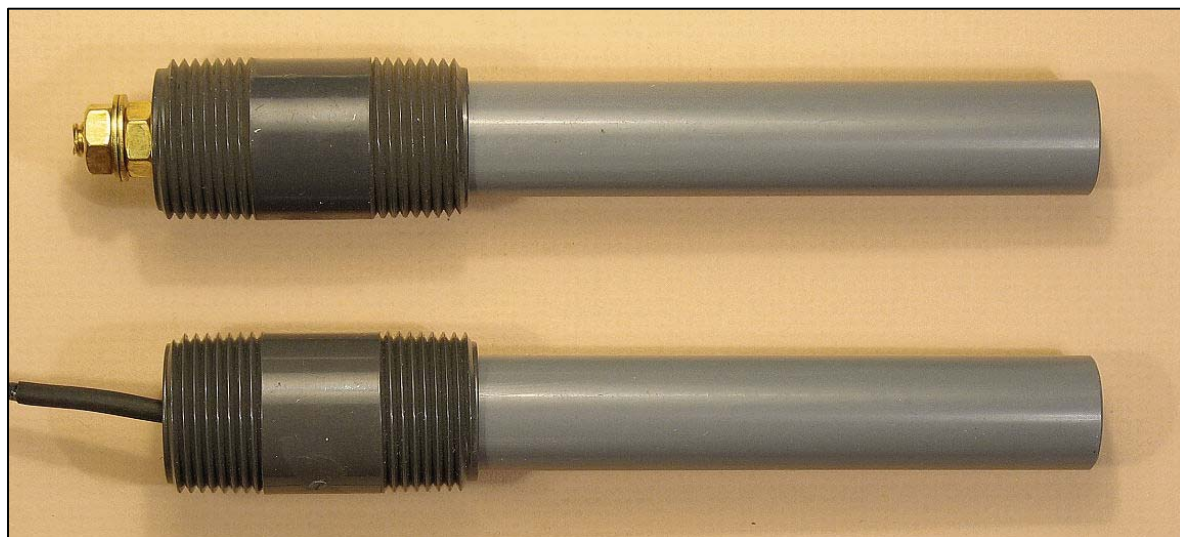


# Standard Duty Through-wall Reference Electrode

## Model FS

Through-wall reference electrodes are used for measuring corrosion potential on the inside of condenser waterboxes, circulating pipes, tanks and vessels. These electrodes are installed by threading into a tapped hole on the wall; a junction box is typically attached to the other end to protect the wiring connections.



**Model FS**, with a CPVC extension tube and a  $\frac{3}{4}$  inch NPS PVC nipple, is designed for standard duty applications. It can be used at pressures up to 40 psi (270 kPa) and intermittent temperatures up to 180°F (82°C). For applications involving pressures up to 75 psi (0.5 MPa), our Heavy Duty Through-wall Reference Electrode, Model FH, is preferred.

The temperature limits stated are those for the wetted materials of construction. Through-wall reference electrodes should generally not be continuously used at temperatures exceeding 110°F (45°C) because the reference potential will be significantly different from its value at ambient temperature and the electrode service life will be drastically shortened. The product will survive occasional brief temperature excursions up to the limits stated in the preceding paragraph. For applications involving continuous exposure to temperatures over 110°F (45°C), our Process Vessel Reference Electrode, Model FE, is recommended.

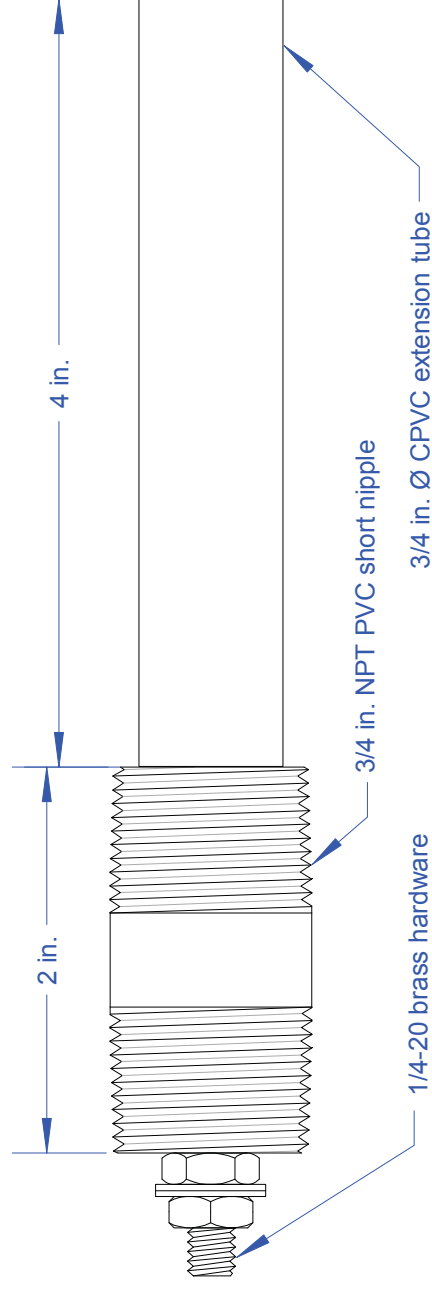
## electrochemical devices, inc.

**Web:** [www.edi-cp.com](http://www.edi-cp.com) **Email:** [info@edi-cp.com](mailto:info@edi-cp.com)  
**Tel:** 617-484-9085 **Fax:** 617-484-3923  
**Address:** P.O. Box 31; Albion, RI 02802-0031

*F Series  
Through-Wall  
Reference  
Electrodes*



### Model FS-xxx-ST - Stud End

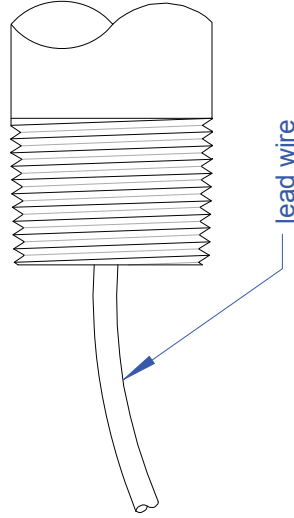


### Model FS-xxx-SW - Short Wire

termination is 1 foot of #16 AWG lead wire

### Model FS-xxx-LWnnn - Long Wire

termination is nnn feet of #16 AWG lead wire



xxx in model designation refers to element type

AGD = Ag/AgCl (dry)

AGG = Ag/AgCl (saturated, gelled)

CUG = Cu/CuSO4 (saturated, gelled)

ZIN = 99.99% zinc

Refer to drawing FX01ASY for probe extensions other than 4 inches.



**electrochemical devices, inc.**  
PO Box 31, Albion, RI 02802 401-333-6112

© EDI 2012

[www.edi-cp.com](http://www.edi-cp.com)

[info@edi-cp.com](mailto:info@edi-cp.com)

SCALE FULL

DRAWN BY FJA

DATE 17 APR 2012

DRAWING NUMBER FSASY-1

# Standard Duty Through-wall Reference Electrode



## Through-wall Reference Electrodes

**Installation** – These instructions apply to all EDI F Series through-wall reference electrodes. Remove electrode from carton and record the serial number and QC test potential; these are located on the yellow tag attached to the lead wire. Remove the protective vinyl cap covering the membrane. Install the electrode so that the membrane is in full contact with the electrolyte. Electrodes with AGG or CUG in the model designation may be installed in any position; electrodes with AGD or ZIN in the model designation must be installed horizontally or with the open end facing upward to prevent air block. Take precautions to prevent the lead wire conductor from contacting any metal surfaces as this can cause permanent damage to the electrode.

**Measurements** - Potential measurements should be made using a voltmeter with input impedance in excess of 10 megohms. Use of meters or data loggers with lower input impedance may result in measurement errors.

**Calibration** - Reference electrodes are calibrated by measuring their potential against a second reference electrode of the same type while both electrodes are immersed in a beaker of potable water. The second electrode should be one which has been set aside specifically for calibration purposes. Alternatively, the electrode can be compared against a newly purchased field grade or laboratory reference which can be used as a standard.

Potentials of all EDI reference electrodes are within 5mV of each other at time of shipment. As reference electrodes age, their reference potential can shift to +/-20mV of their original value. If a larger shift is noted or if the potential is not stable, then the electrode should not be placed back in service. However, reference electrodes can often be rejuvenated by soaking them in the appropriate saturated salt solution\*.

- \* *Saturated salt solutions should be prepared using technical or laboratory grade chemicals in distilled or, preferably, deionized water. Add sufficient salt so that there is extra undissolved salt present in the solution. Use potassium chloride salt (KCl) with Ag/AgCl elements and copper sulfate salt (CuSO<sub>4</sub>) with Cu/CuSO<sub>4</sub> elements.*

### **Conditions to avoid**

- 1) Exposure to temperatures in excess of 130°F or below 20°F may damage the electrode.
- 2) Exposure to electrolytes containing chlorides (Cu/CuSO<sub>4</sub> references only), sulfides or other halides (Cu/CuSO<sub>4</sub>, Ag/AgCl and Zn references)

**Storage** - Permanent reference electrodes may be stored for up to one year with the vinyl protective cap in place. The cap prevents the membrane from drying out. They should be stored indoors in a location not subject to large temperature variations. For long term storage, it is preferable to keep the uncapped reference immersed in a saturated salt solution or keep the capped reference immersed in water. If the electrodes cannot be stored immersed, then the cap should be removed every six months and the membrane moistened with a saturated salt solution.