

# Model TF0221

## Lazaran Ag/AgCl Half-Cell Reference Electrode

The TF0221 Ag/AgCl Reference Electrode is of a specially rugged design for use in severe environmental conditions, such as high flow and pressure regimens. Its size and thread design are compatible with all Metal Samples Corrosion Monitoring Systems electrochemical probes, laboratory test cells and autoclaves systems which use the EL412 series of pin electrodes. It is unique in providing a stable reference potential in almost all industrial applications where electrochemical measurements are made.

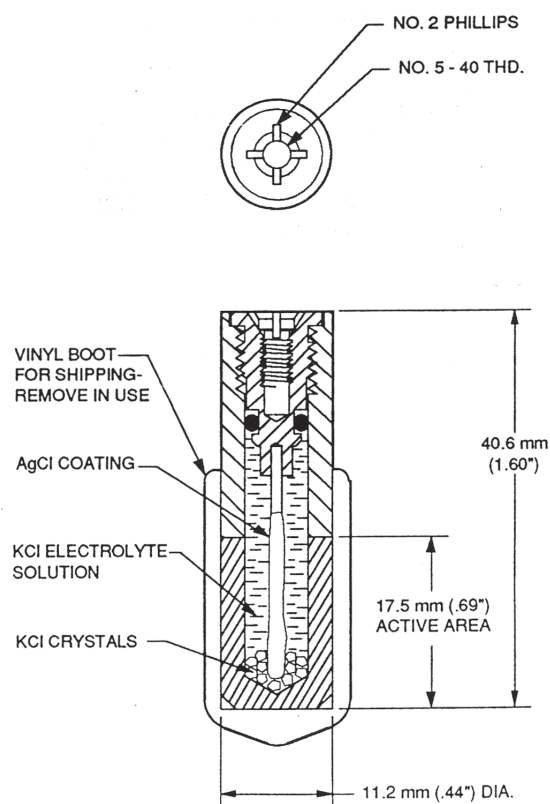
The electrode consists of a silver wire coated with silver chloride immersed in an electrolyte of saturated potassium chloride and silver chloride. The half cell and electrolyte are contained in a Teflon® outer casing with a portion composed of 25% glass filled Teflon®. This provides the conductive bridge to the external sample. The electrode assembly is attached to the probe or extension rod by a 5 - 40 UNC internal thread to provide a mechanically strong connection.

### INSTALLATION

Locate the pin which is attached to the "A" line connection on the industrial probe. This may be done using any continuity test between the "A" pin on the military connector of the probe and one of the outside threaded pins for attaching the electrodes.

Using one (1) Viton® or Teflon® gasket between the probe body and the electrode, screw the TF0221 electrode firmly onto the "A" pin. A liquid-tight seal must be made at the rim of the electrode base by the gasket to prevent the silver body of the electrode from making electrical contact with the solution. The electrode must be attached to pin "A" on the probe which is the reference electrode pin. Remember to remove the vinyl boot covering from the active area of the TF0221 electrode before installing the probe into the system.

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Viton® is a registered trademark of DuPont Dow Elastomers.



When removing the TF0221 electrode from the probe, it is important that both the electrode body and the Viton® gasket be grasped, then turn both counter-clockwise. If the electrode is removed by turning the electrode body only, then the silver internal element may be unscrewed from the electrode casing.

### STORAGE & REJUVENATION

The TF0221 electrode is a sealed unit filled with saturated KCl electrolyte. No external reservoir for electrolyte is required. The electrode is shipped in a 2 molar KCl solution with the active area covered with a vinyl boot. This solution is not highly corrosive but excessive contact with the skin should be avoided. When stored, the electrode should be kept wet by immersion in water or a KCl solution with the vinyl boot in place. The silver body of the electrode can be protected from the storage solution by using the

Nylon screw and Viton® gasket provided. The internal cell should be kept filled with electrolyte with a few crystals of KCl present to ensure that the solution surrounding the silver-silver chloride element is saturated.

Should the electrode dry out it can be rejuvenated by the following procedure. Remove the electrode body from the casing with a Phillips screwdriver. Wash the casing with distilled water or alternatively boil it in a concentrated solution of KCl for one hour. Shake the casing dry and add a few crystals of KCl (0.1 gram) to the cavity. Fill the casing to just below the internal thread with potassium chloride saturated with silver chloride solution. If the electrode is to be used under high pressure, the cavity must be filled completely with electrolyte. Screw the electrode body into the filled casing until the body is at or below the lip of the casing to ensure the body will be sealed with the electrode gasket when in use. A small amount of electrolyte should appear when tightening the body which confirms that the cavity is completely filled.

If the electrode is compared to a commercially available Saturated Calomel electrode (glass body with porous ceramic junction) using a high impedance DC voltmeter a voltage of -0.050 to -0.055V should be obtained in tap water at 21°C.

## SPECIFICATIONS

Electrode Potential:

-0.199V vs. Std. hydrogen electrode

Internal Half Cell:

Silver/ Silver Chloride

Operating Temperature Range:

-5° C to +105° C @ 1 Atm

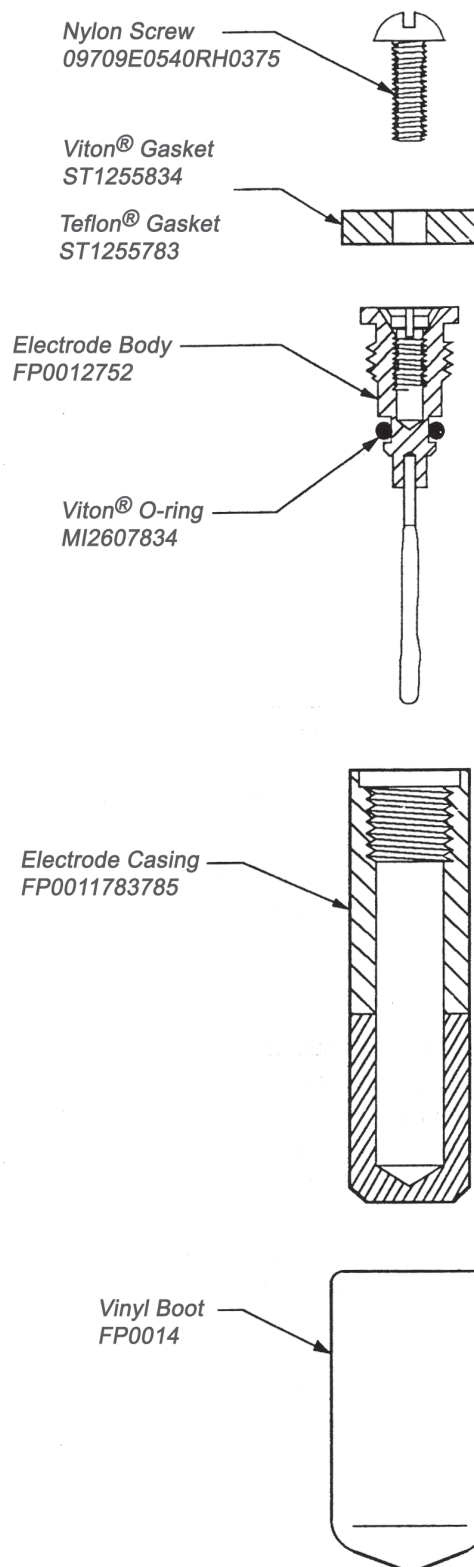
Operating Pressure:

0 to 150 psig

Temperature Variation:

+0.6 mV/ °C

Note: The electrode has shown to provide stable readings at pressures up to 3600 psi provided the electrode cavity is completely filled with electrolyte.



## Metal Samples Corrosion Monitoring Systems

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