

# Process Vessel Reference Electrode

## Typical Applications:

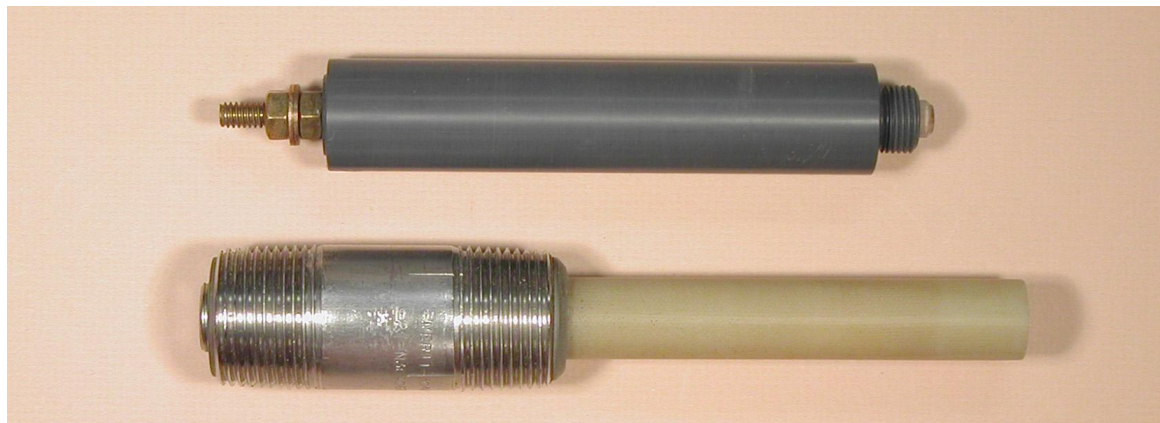
É Oil separators, heater treaters, bleach tanks, industrial boilers and process vessels

## Featuring:

É Two piece design which isolates the reference element from the environment

É Permanently installed bridge fabricated from G-10 glass reinforced epoxy

É Removable CPVC housing contains the reference element



## Bridge Specifications

1 in. NPT stainless steel nipple  
G-10 GRE extension, 3/4 in. (2 cm) dia.  
length to suit

3/8 in. NPT-F junction well  
Pressure rated to 50 psi (350 kPa)  
Max. process side temp. +200F (95C)  
Shipping weight ó 1 1/2 lb (3/4 kg)

## Body Specifications

1 in. dia. (2.5 cm) x 5 in. (13 cm) CPVC  
with smooth or threaded junction:  
Smooth - Slip-fit junction  
Threaded - 3/8 in. NPT-M junction  
Shipping weight ó 1/2 lb (1/4 kg)

## Design Compatibility

The **Model FE Process Vessel Reference Electrode** is designed to operate in extreme environments with elevated temperatures, high pressures and/or contaminated electrolytes where ordinary reference electrodes cannot survive. A bridge is installed at each location where potential readings are desired. The reference element is contained in a separate housing isolating it from the aggressive environment; this substantially increases its service life. When continuous readings are required, the reference is threaded into the bridge. For intermittent readings, the reference is simply pressed into the bridge. In this case, a single reference can be used with several bridges.

## Element Types

AGG - saturated gelled Ag/AgCl  
CUG - saturated gelled Cu/CuSO<sub>4</sub>

## Model Designation - Bridge

Specify as **EDI Model FE-BDG-n.n**  
n.n = extension length in 0.5 inch increments,  
1 inch (2.5 cm) min., 6 inch (15 cm) max.

## Model Designation Æ Body

Specify as **EDI Model FE-xxx-STy**  
xxx = Element type  
y = Junction style:  
(S for smooth, T for threaded)

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*F Series  
Through-Wall  
Reference  
Electrodes*



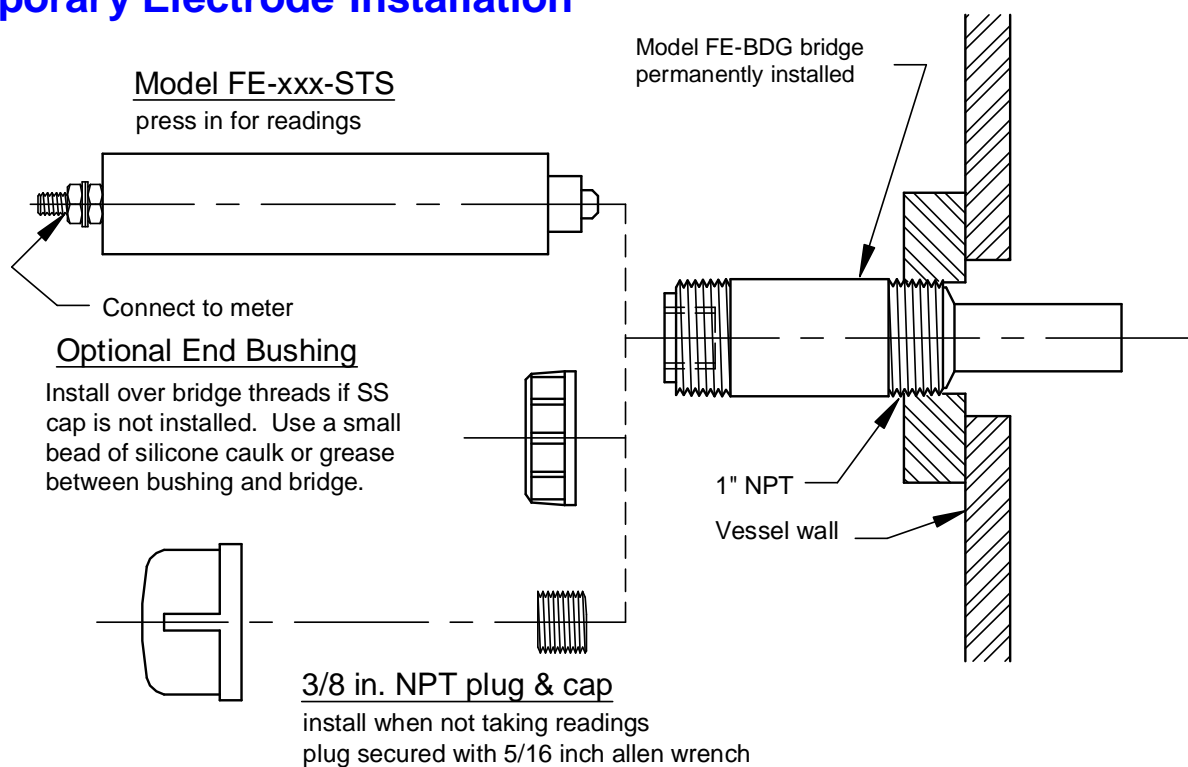
# Operating Instructions

The Model FE Process Vessel reference electrode consists of two pieces:

1. A bridge, which is permanently installed in the vessel,
2. A reference, which can be either permanently installed or temporarily inserted when measurements are required.

All bridges are factory tested to 150 psi (1,000 kPa). The bridge is designed to leak slightly in service to ensure good conductivity; the quantity of liquid emitted will be proportional to the pressure differential across the bridge.

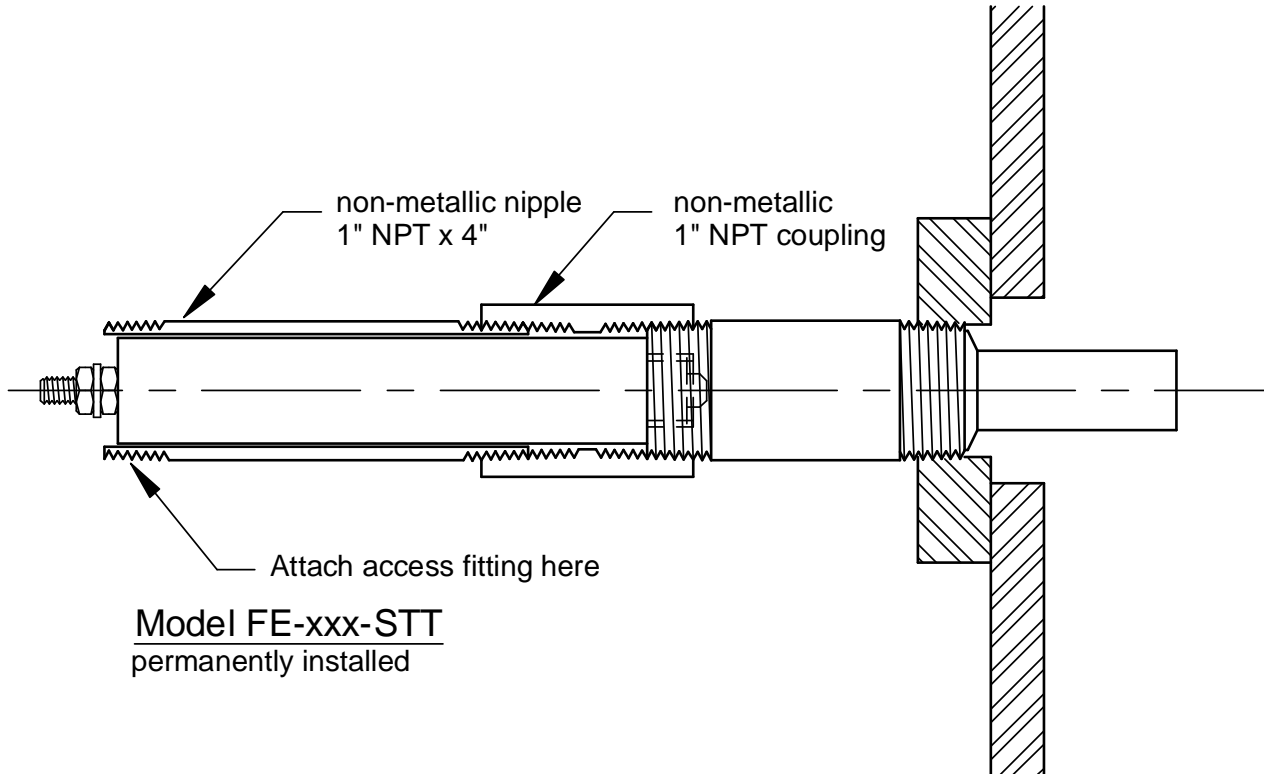
## Temporary Electrode Installation



In a temporary installation, the reference electrode is inserted into the bridge whenever a potential measurement is required. If electrolyte weeping from the bridge contacts the metal nipple, the readings may be affected. This can be prevented by properly installing the plastic end bushing on the nipple. In between readings, the 3/8 inch pipe plug should be installed in the bridge; at pressures over 50 psi (350 kPa), the 1 inch end cap should also be used. If the end cap is not used, the end bushing should be installed to protect the nipple threads. Since the bridge will leak slightly to relieve the pressure buildup, Teflon tape or a non-hardening Teflon pipe dope should be used on the end cap threads when leak-free installation is required.

Whenever the end cap or pipe plug is removed, it should be assumed that the liquid behind it is under pressure. The cap should be slowly loosened to bleed off the pressure; once the leakage has stopped, the cap can be removed. The same procedure must be repeated when removing the plug.

## Permanent Electrode Installation



For maximum electrode life, the electrode should be installed into the bridge using no pipe thread sealants or gaskets. A small amount of liquid will leak from the joint preventing a pressure buildup inside the bridge. Should a leak-free joint be required, then the appropriate sealants and gasket can be used. Note, however, that if the gasket is used, the bridge will be operating at the vessel pressure, which can force some of the vessel contents into the electrode and shorten its life.

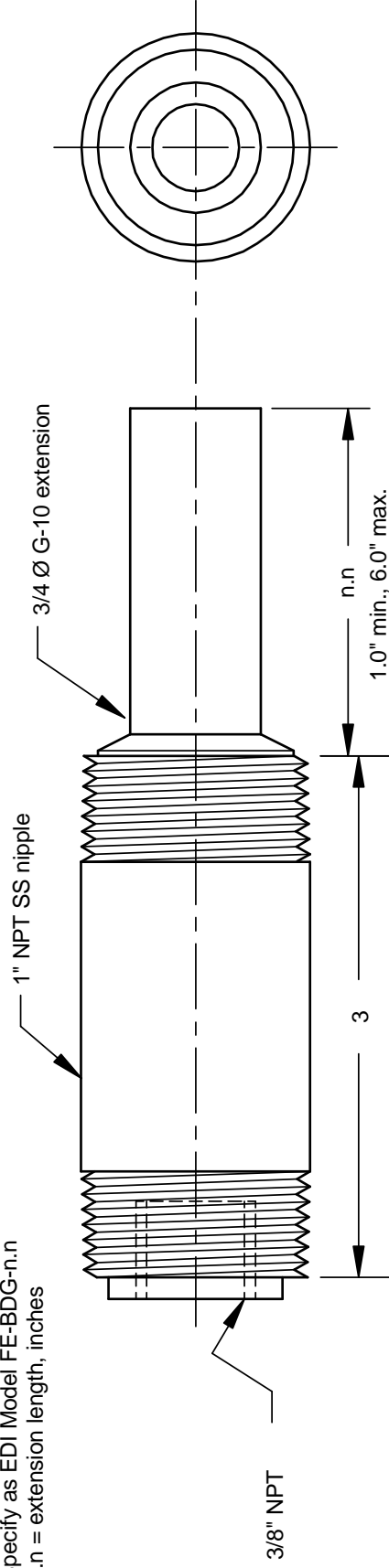
To replace a permanently installed electrode, it is not necessary to drain the vessel since the bridge remains permanently installed. Loosen the electrode just enough for the joint to start leaking which will relieve any pressure at the end of the bridge. When the leaking stops, continue to slowly unscrew the electrode until it is removed. A new electrode can then be installed.

## **Safety Precautions**

*Appropriate safety equipment as required by the vessel contents and pressure must be used whenever the pipe plug, end cap or electrode is removed from the bridge. At a minimum, suitable eye protection must be used even if the vessel only contains water. It is always possible that a small amount of liquid will spray out under pressure when the plug, cap or electrode is first loosened.*

## Bridge

Specify as EDI Model FE-BDG-n.n  
n.n = extension length, inches

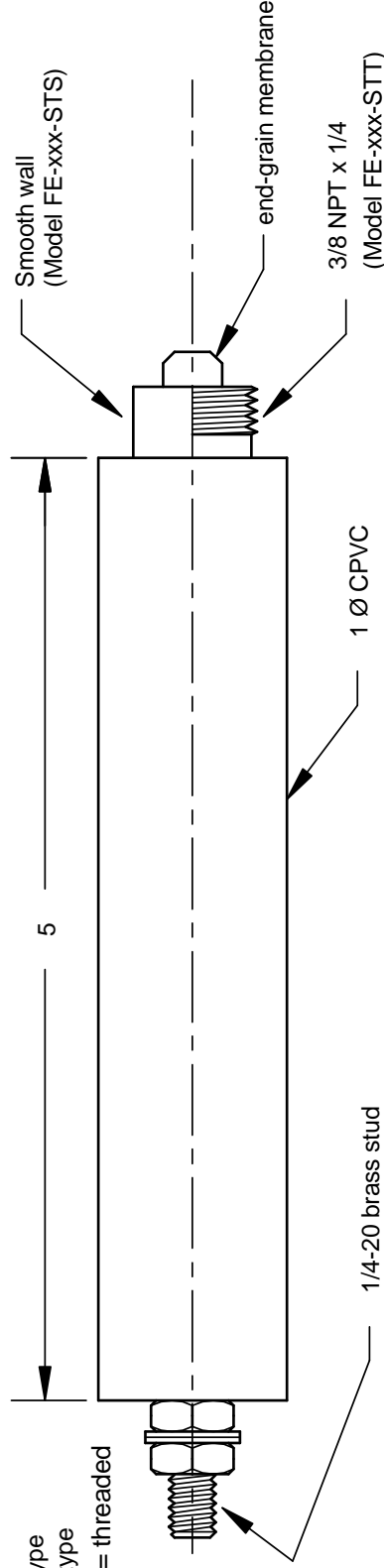


## Body

Specify as EDI Model  
FE-xxx-STy

xxx = element type  
y = connection type

S = smooth, T = threaded



Element Types

AGG = Ag/AgCl (saturated, gelled)

CUG = Cu/CuSO<sub>4</sub> (saturated, gelled)

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**Extreme Environment Reference Elect.**

SCALE FULL

DATE 06/04/03

DRAWN BY FJA

DRAWING NUMBER

FEASY