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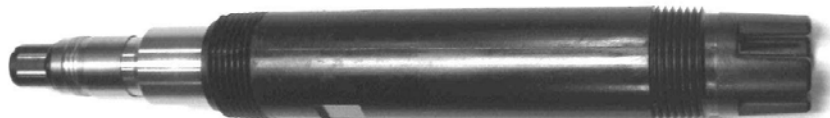
## АНАЛИТИЧЕСКИЕ ПРИБОРЫ

Технические характеристики на  
держатель для электрода  
7777DVP

# 1. Introducti

## 1.1 Overview

The 7777DVP Series of electrode mountings enables a user to interface a Durafet® III pH electrode to a process by either submersing the electrode or mounting it into a ¾" threaded connection.



Honeywell's Durafet III Series of industrial electrodes have been designed to provide accurate and stable pH measurements for a wide variety of industrial applications. The Durafet III pH electrode is a non-glass pH electrode. The pH measurement is based in ISFET (Ion Selective Field Effect Transistor) technology, which results in a solid state pH sensing electrode. The Durafet pH electrode is much more rugged than the traditional glass pH electrode. The sturdy pH electrode reduces replacement and inventory costs. The solid state sensing element is packaged in a durable Ryton body that results in a pH electrode that has extended life in a wide variety of process conditions. The ISFET technology also produces an electrode that is up to 10 times faster than glass electrodes. This fast response improves product quality and provides better process control to optimize chemical usage.

## 1.2 Compatibility

Durafet III pH electrodes for the 7777DVP Series are available in a number of options to meet customer application and installation needs. The electrode body is 1" in diameter with ¾" threads at both ends of the electrode. For submersion applications conduit is threaded on to the top of the electrode so that it can be lowered into the process. For in-line applications the electrode is threaded into one leg of a pipe tee. A temperature sensor is mounted internal to the electrode to measure process temperature and provide a temperature signal for automatic (Nernstian) temperature compensation. Two temperature sensors are available: 8550 ohm thermistor and 1000 ohm RTD.

The Durafet III pH electrode is compatible with various pH instrumentation:

- Honeywell 7082 and 9782 Series pH Analyzers with Cap Adapter.
- APT2000/4000 Series with Cap Adapter.
- Non-Honeywell instruments with Cap Adapter. Consult your Honeywell sales representative for a list of instruments with this compatibility.

### 1.3 Application Restrictions

Avoid using the Durafet III series pH electrode with these chemicals and applications:

- Hydroflouric acid
- High purity water (<10  $\mu\text{S}/\text{cm}$ )
- Hot caustic (see Figure 1-1 below)

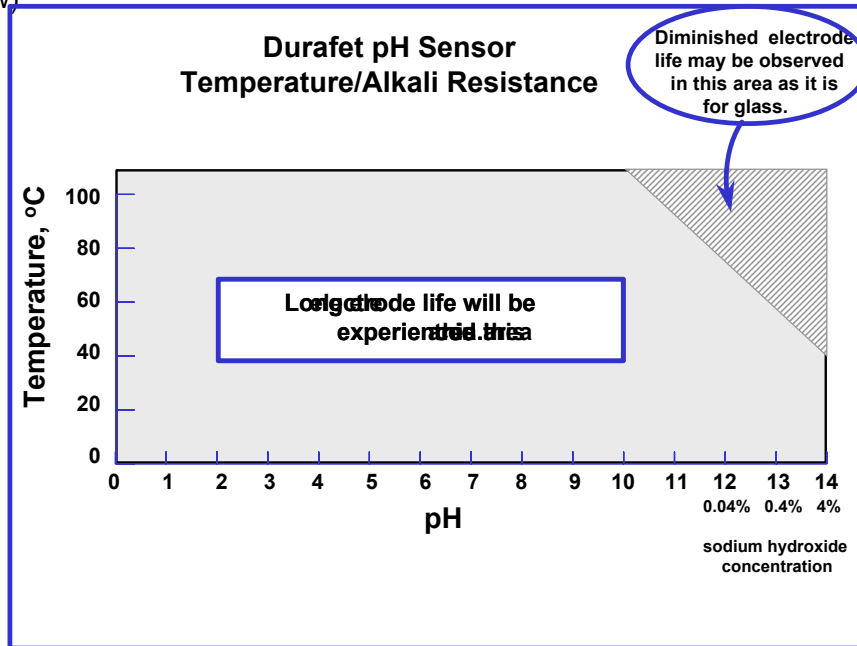


Figure 1-1 Temperature vs. Alkali Resistance

## 2. Specifications

¾" NPT Specifications	
Operating Range	0-14
Pressure Rating	345 kPa (50 psig) @ 100°C, 690 kPa (100 psig) @ 50°C
Temperature Rating	-10 to 110°
Temperature Sensor	8550 ohm Thermistor and 1000 ohm RTD
Wetted Materials	Ryton body, silicon ISFET die, Ceramic reference junction, Viton media seal, EPM reference frit seals
Electrical Connection	Durafet III: Vario Pin, 11 conductor connector, IP68 rated
Acceptable Cables and Lengths (ordered separately)	DirectLine Remote Cable: 20 feet and 50 feet Cap Adapter (for 9782P and APT Series): 20 feet and 50 feet
Weight	Durafet III: 0. 23 kg (0.5 lb)



### 3. Dimensions

mm  
inches

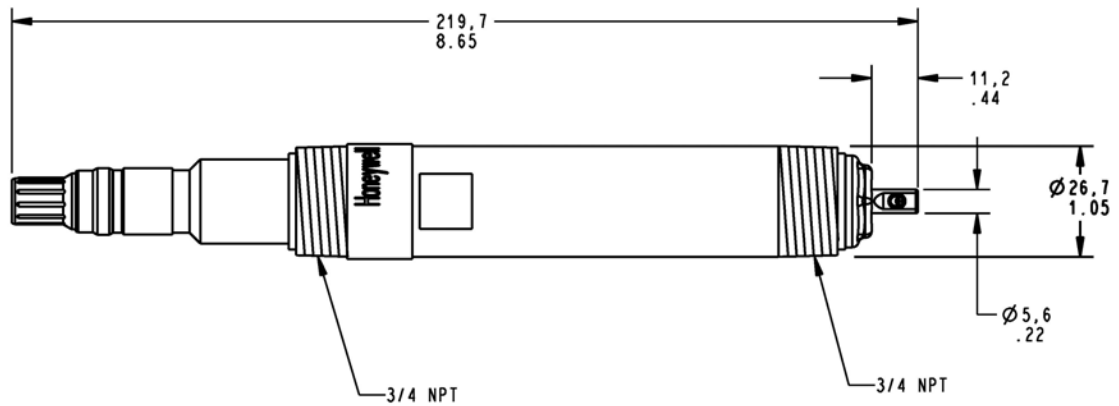


Figure 3-1 Durafet III (Vario Pin Connector) pH Electrode for In-Line Mountings (Smooth Tip)

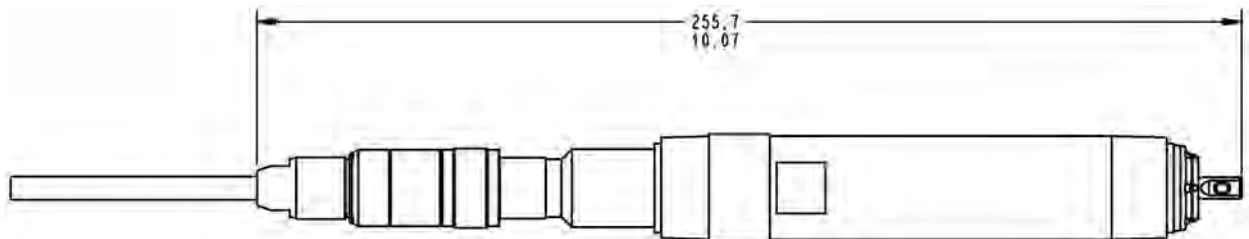


Figure 3-2 Durafet III (Vario Pin Connector) pH Electrode for In-Line Mountings (Smooth Tip), with cable

Dimensions

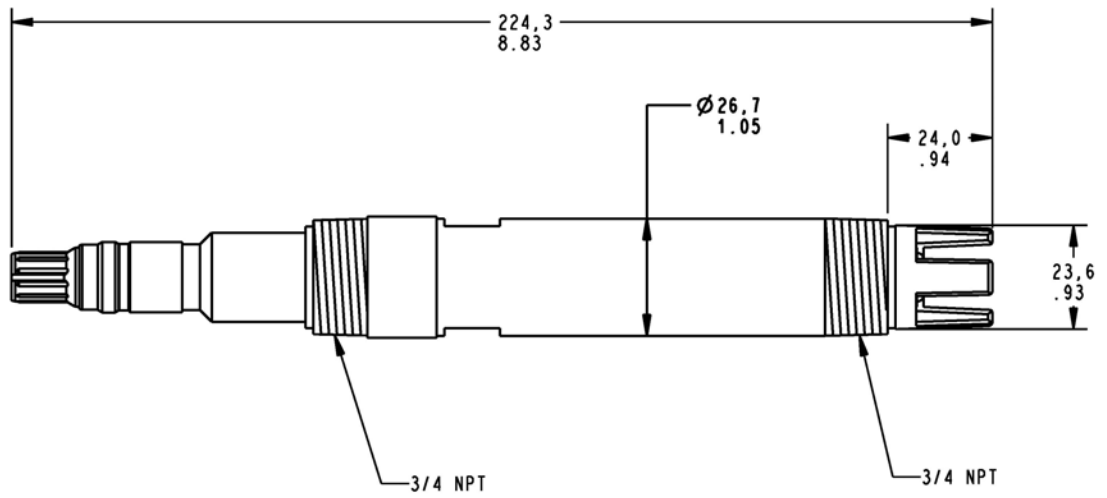


Figure 3-3 Durafet III (Vario Pin Connector) pH Electrode for Immersion Mountings (Guarded Tip)

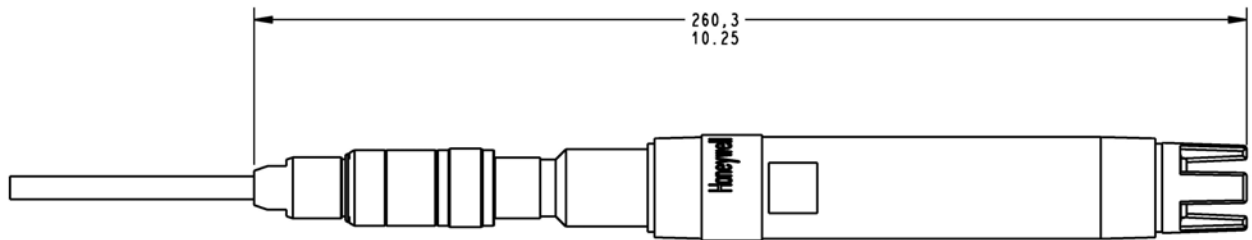


Figure 3-4 Durafet III (Vario Pin Connector) pH Electrode for Immersion Mountings (Guarded Tip), with cable

## 4. General Assembly Instructions

### 4.1 Selecting Materials of Construction

#### Electrode

The materials used in the construction of the DurafetIII pH electrode are listed in the specifications. Materials of wetted parts must be compatible with the process temperature and corrosion conditions.

#### User-supplied components

Pipe couplings, and tees must be supplied by the user. Select materials that are compatible with the process temperature and corrosion conditions.

### 4.2 Sealing Pipe Joints

When making pipe joints apply Teflon tape pipe sealant to male threads. Wrap the threads with the tape overlapping by 50% on each wrap. Start the wrap at the end of the pipe and wrap in the direction of the thread at least two turns.

When installing an electrode, apply Teflon tape to the threads, then hand-tighten the electrode in the fitting only until snug. If necessary to stop a leak, a wrench may be applied to the electrode's wrenching flats to further tighten the joint only until the leak has stopped. Always leave at least one thread on the electrode showing outside the fitting.

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#### CAUTION

When tightening an electrode never exceed 15 ft-lb applied torque. Applying too much torque can result in damage to the electrode.

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### 4.3 Durafet III Electrode Preparation

Prepare Durafet III electrode as described in the electrode manual, part number 70-82-25-115.

### 4.4 Cap Adapter Option for Durafet III Electrodes

The Cap Adapter option for Durafet III electrodes eliminates the need to separately mount a preamplifier. The Cap Adapter is a preamplifier electronics module that is integral with the electrode-to-instrument cable. The preamplifier PCA is molded into the cap of the quick-disconnect connector. The cable has tinned leads that are ready to be wired directly to 9782/7082 Analyzer or APT2000/4000 Transmitters and Analyzers.

The Cap Adapter mounts directly on the Durafet III electrode. The electrode has a key that mates with the keyway in the connector on the cable. The cap is then threaded onto the electrode. The cap should be hand-tightened and engage the O-ring at the top of the electrode. The knurled fitting at the top of the cap should be hand-tightened to seal an internal O-ring around the cable. When properly threaded onto the electrode the connection is waterproof.



## 5. Pressur Test

### When to perform the test

Before submerging an assembly do a low-pressure test to check the various seals made during the assembly operation.

### How to perform the test

Table 5-1 lists the steps for pressure testing the assembly.

**Table 5-1 Instructions for Pressure Test**

Step	Action
1	Double back the cable into the immersion pipe.
2	Connect a source of low-pressure air to the immersion pipe. [Approximately 69 kPa (10 psi) will simulate immersion in 6.10 m (20 ft) of water.]
3	Immerse the assembly in a shallow tank of water and look for any indication of air bubbles streaming from the assembly.
4	To seal leaking connections: <ul style="list-style-type: none"><li data-bbox="363 936 778 965">• Use extra Teflon tape on pipe joints.</li><li data-bbox="363 981 778 1010">• Use silicone grease on O-ring seals.</li><li data-bbox="363 1025 943 1055">• Make the connecting rings on the preamplifier snug.</li></ul>

## 6. Electrode Cable Connections

### 6.1 Electrode Cables

The Durafet III pH electrode is supplied with a connector at the electrode top to provide a quick disconnect for easy electrode replacement or with an integral cable.

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**CAUTION**

ESD sensitive devices inside Durafet III electrodes and Cap Adapter Cables.

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#### Cable connectors

The electrode cable terminates with a female Vario Pin connector on one end and tinned leads at the instrument end.

#### Avoid contamination

The connectors are constructed with high resistance insulating material which can be contaminated if exposed to oil and salts from bare hands. Avoid contaminating the internal area of the connectors.

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**CAUTION**

Do not allow liquids or other foreign matter to contact the cable connectors. Save the protective cap supplied with electrodes with connectors and put the cap on the connector whenever the cable is not installed on an electrode.

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#### How to clean the connectors

The connectors can be cleaned by wiping with a cotton swab moistened with isopropyl or grain alcohol. **Allow connectors to dry completely before making connections.**

### 6.2 Cable Connection

Make sure electrode connector and cable connector are clean and dry. Align key way on VarioPin connector of electrode with tab inside mating connector on cable. Press cable connector onto electrode firmly. Tighten knurled bushing of cable connector by hand to ensure waterproof seal.

## 7. Connecting a Cap Adapter to an Instrument

### 7.1 Cap Adapter

The Cap Adapter is an integral part of the electrode cable. It is essentially a preamplifier that does not require separate mounting. The output from the Cap Adapter can be connected directly to a pH instrument. The Cap Adapter and cable for Durafet III electrodes are available in lengths of 20' and 50'. One end of the Cap Adapter cable is the mating connector to the Vario Pin of the Durafet III electrode. The other end of the cable terminates with tinned leads. The tinned leads connect to the input terminals of the pH instrument as described below.



Figure 7-1 Cap Adapter Cable

### 7.2 Connection to a 9782 pH Analyzer

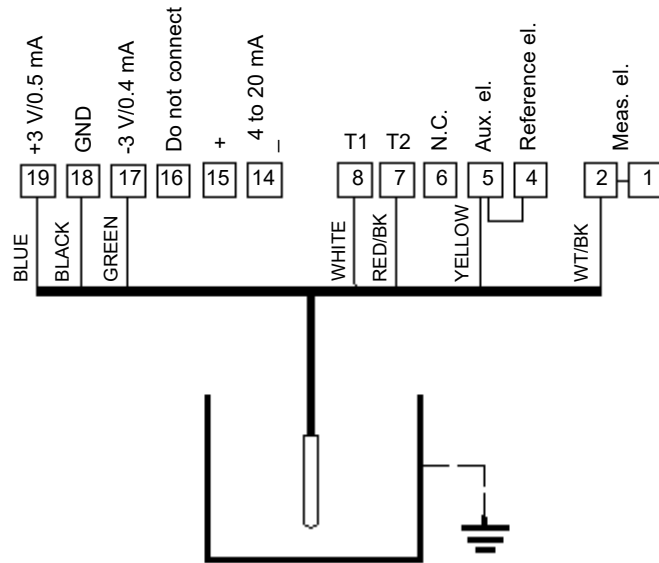
The Cap Adapter is connected to a 9782P-01 analyzer. (See *Instruction Manual #70-82-25-73 "9782 pH/ORP Multifunction Analyzer/Controller"*, for a more detailed description of the 9782.) Connect the tinned leads of the Cap Adapter cable as follows:

Wire Color	9782 Terminal
Orange	
Blue	
Green	
White	
Black	
Red	H
Yellow	Ground Screw
White/Black	Used
Red/Black	H

---

### 7.3 Connection to an APT2000 pH Transmitter

The Cap Adapter can be connected to the APT2000 pH Transmitter. (See the *APT2000 pH Transmitter Manual*, part number 70-82-25-92, for more detailed description of the APT2000.)



**NOTE:**

Orange and Red wires are not typically connected. These should be clipped and electrically sealed to avoid possible contact with other conductors.

**Figure 7-2** Connecting to an APT2000 pH Transmitter

## 7.4 Connection to an APT4000 pH Analyzer

The Cap Adapter can be connected to the APT4000 pH Analyzer. (See the *APT4000 pH Analyzer Manual*, part number 70-82-25-103, for more detailed description of the APT4000.)

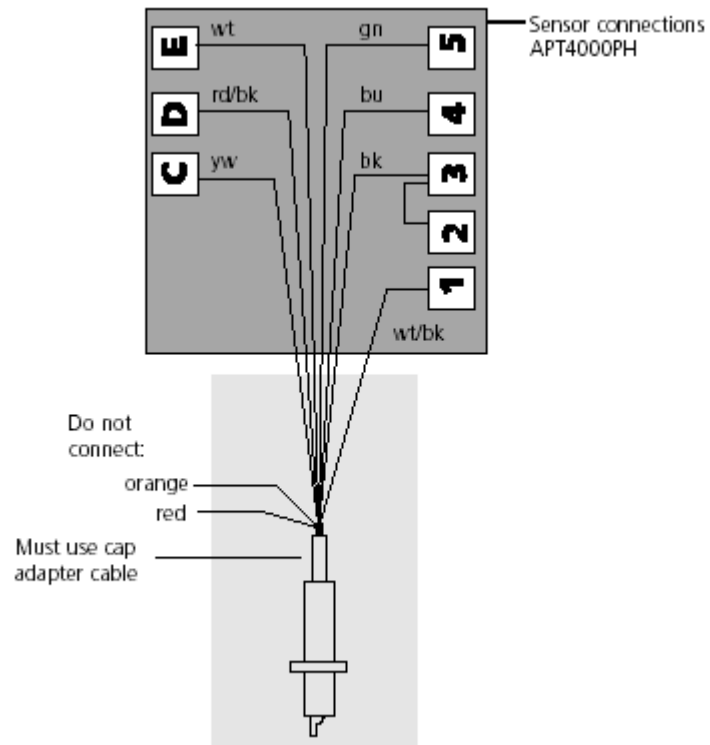


Figure 7-3 Connecting to an APT4000 pH Analyzer

## 8. Immersio Mounting

### 8.1 General Information

#### Intended Use

The system can be used in a variety of configurations to accommodate many techniques for support, immersion, and removal of the electrode in a process solution.

A variety of mounting configurations are used according to the process application. By using accessory parts such as pipe, pipe fittings and cable grips, an immersion assembly can be built to suit a specific application.

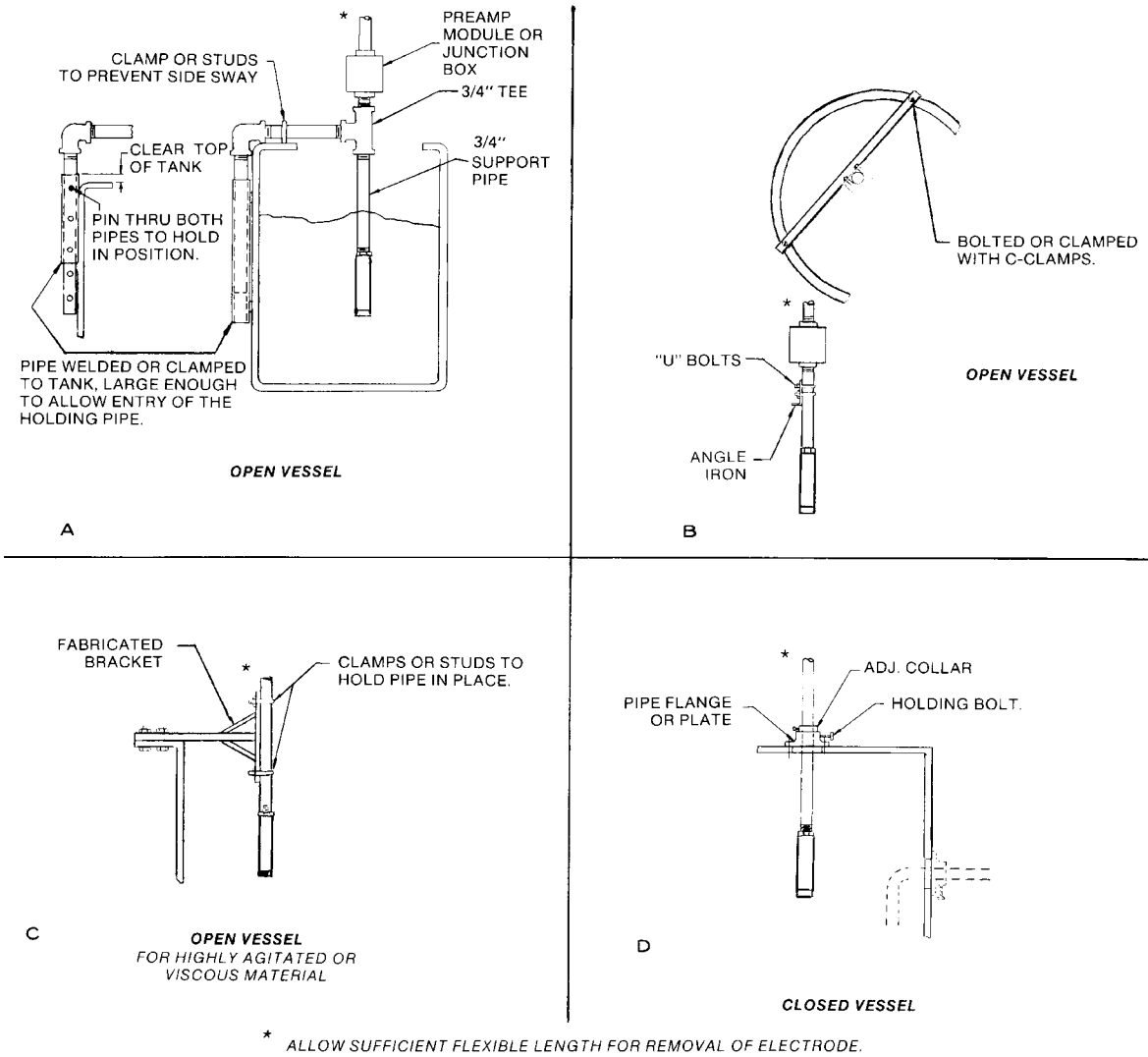
#### Minimum immersion depth

In all cases, the electrode body should be immersed a minimum of 5.08 cm (2 in.) into the process liquid to ensure proper temperature compensation.

#### Suggested support arrangements

Figure 8-1 illustrates possible support arrangements for immersion mounting of the Durafet III electrode.

# Immersion Mounting



**Figure 8-1 Suggested Support Arrangements**

## 8.2 Direct Electrode-to-Instrument Applications (Cap Adapter)

### Application

Figure 8-2 illustrates this configuration.

### Materials required

The material supplied with this catalog number is listed below.

Quantity	Item
1	Durafet III Electrode with slotted tip and cable

Materials supplied by the user are listed below.

Quantity	Item
1	Length of 3/4 in. Sch. 40 pipe, threaded on both ends. Pipe length to be determined by user. When planning pipe length, allow enough cable between the pipe and the instrument to permit removal for servicing.
2	3/4 in. NPT metal Sch. 40 pipe couplings
1	3/4 in. NPT cable grip for 1/8 in. diameter cable

### Assembly

Assemble the materials as shown in Figure 8-2.

### CAUTION

Do not push excess electrode cable into the immersion pipe or pipe coupling.

### Dimensions

For mounting dimensions, see Section 2.

### Cable electrode to instrument

Cable electrode to instrument as described in Section 6.

### Pressure test

Perform a submersible pressure test (see Section 5).

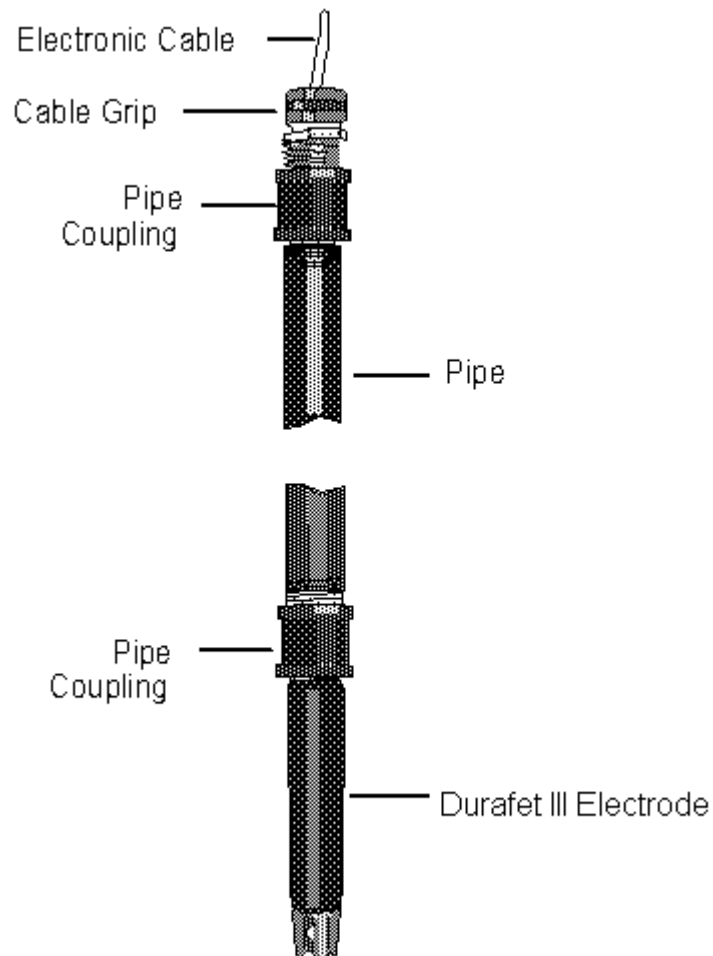
### Mounting

Mount the assembly. See Figure 8-1 for mounting suggestions.



**Arrangement of components**

Figure 8-2 illustrates the configuration of components used for direct connection of the electrode to the instrument without an external preamplifier module or external preamp adapter.



**Figure 8-2 Direct Electrode-to-Instrument Connection**

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