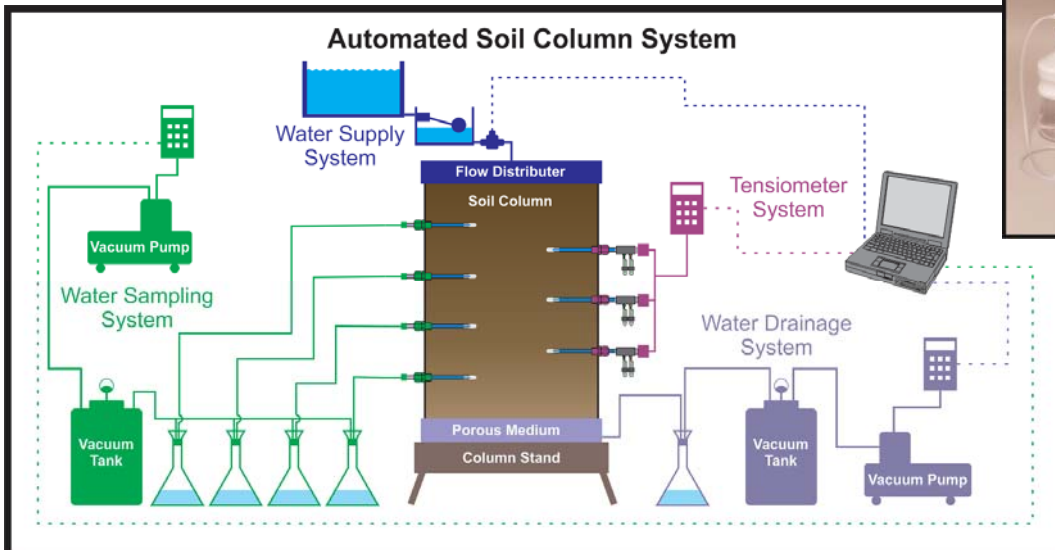
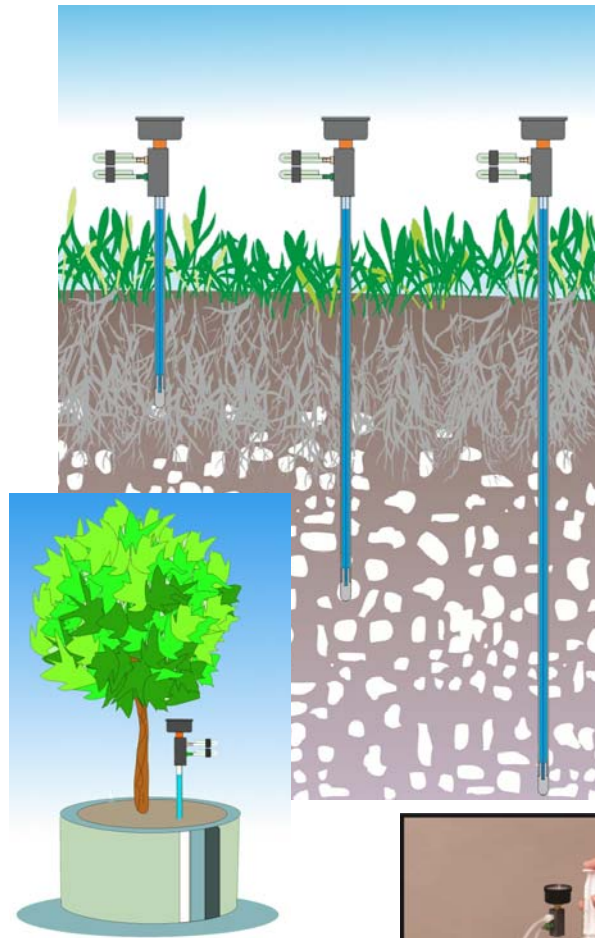


2705

Quick Start Guide

Pencil Tensiometer/Sampler

October 2012



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UNPACKING

The Pencil Tensiometer was thoroughly tested before shipment. When packed, it was in perfect working order. Unpack with care and remove all packing material. Follow the instructions carefully in order to ensure long, trouble-free service.

Any damage found upon receipt should be reported immediately to the transport carrier for claim. It is important to save the shipping container and all evidence to support your claim. Be sure to read all operating instructions thoroughly before operating the unit.

WARRANTY & LIABILITY

Soilmoisture Equipment Corp. (SEC) warrants all products manufactured by SEC to be free from defects in materials and workmanship under normal use and service for twelve (12) months from the date of invoice provided the section below has been met.

Soilmoisture Equipment Corp. (SEC) is not liable for any damages, actual or inferred, caused by misuse or improper handling of its products. SEC products are designed to be used solely as described in these product operating instructions by a prudent individual under normal operating conditions in applications intended for use by this product.



ACQUAINT YOURSELF WITH THE PARTS

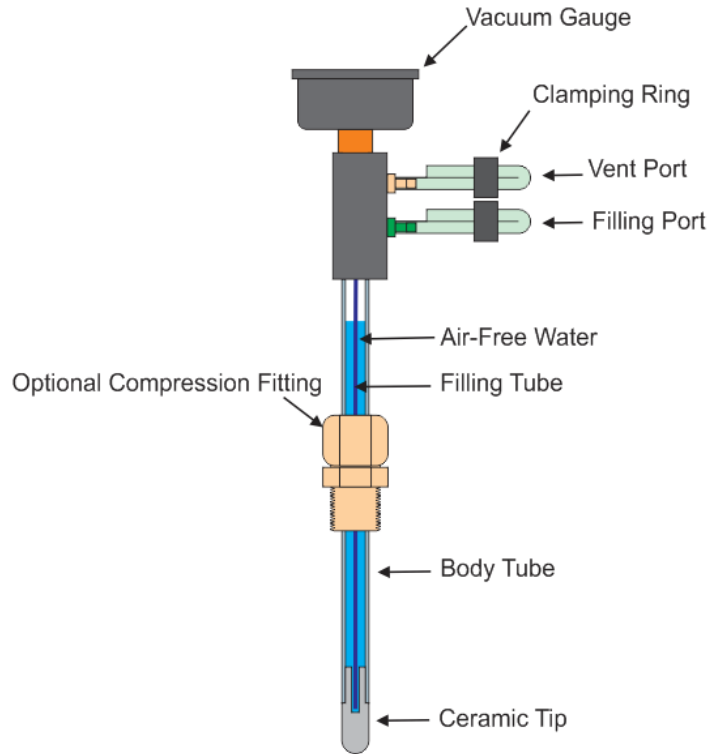


1. Pencil Tensiometer
2. Insertion Rod (optional)
3. Air-Free Water Bottle
4. Syringe Assembly
5. Vacuum Hand Pump

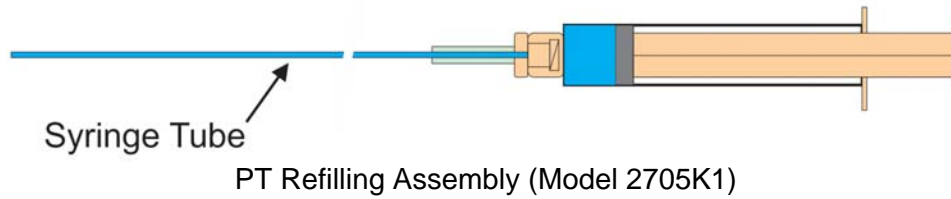


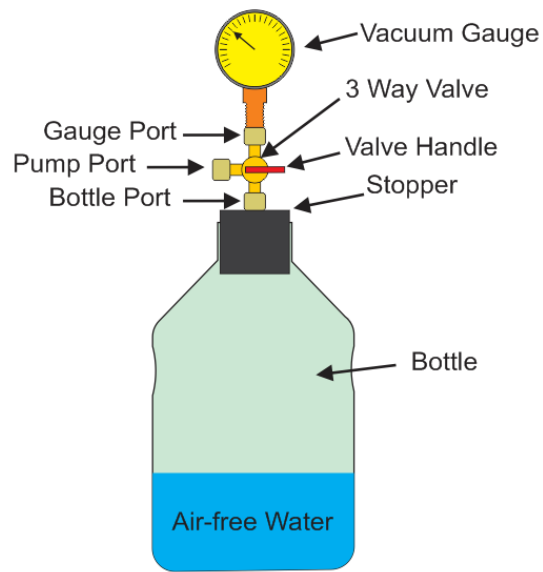
Three possible connection options

SYSTEM MAIN COMPONENTS

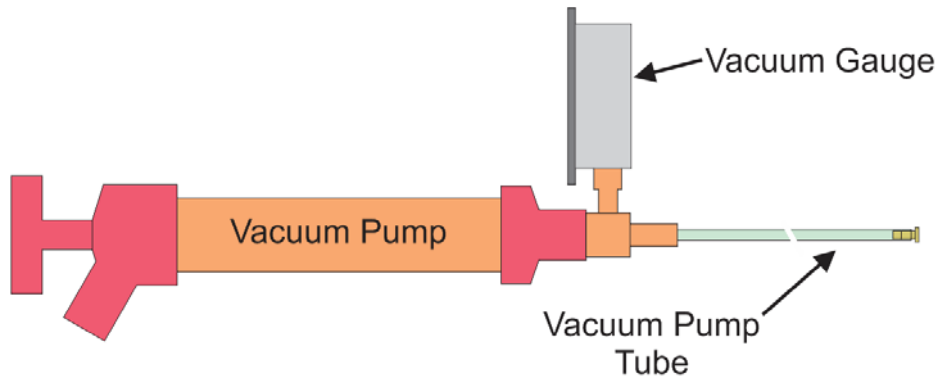


Pencil Tensiometer (Model 2705L#)
Where # is the Body Tube Length in inches: 12, 24, or 36





Air-Free Water Bottle Assembly (Model 2705K3)

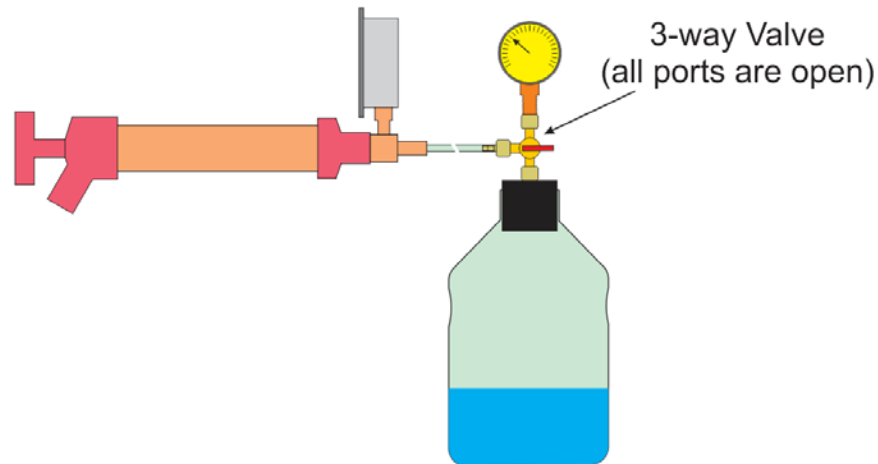


Vacuum Pump (Model 2705K2)

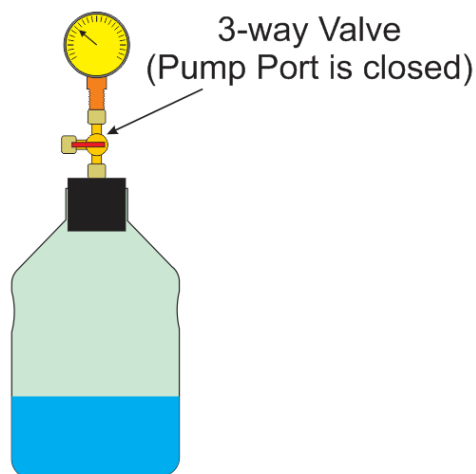
PREPARING AIR-FREE WATER

Pour approximately 500 ml hot water (about 75 °C = 170 F) in 1 liter bottle. This is the temperature of a cup of hot tea or coffee.

Connect the Vacuum Pump to the Air-Free Water Bottle. Make sure that all ports on the 3-Way Valve are open.



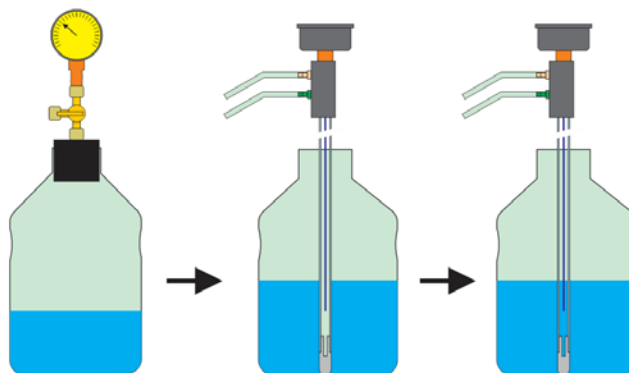
- Apply about 0.7 bar vacuum to the Bottle with the Vacuum Pump. The water will start to boil.
- Maintain a vacuum of about 0.7 bars for 10 minutes. If the vacuum drops below 0.7 bars, apply more vacuum using the Vacuum Pump.
- Close the Pump Port (see figure below) and let the bottle set until the water cools to room temperature.
- If the vacuum is below 0.7 bars, apply more vacuum with the Hand Pump.
- Keep the Air-Free Water Bottle sealed for future use.



WETTING A NEW, DRY PENCIL TENSIOMETER

When you receive your Pencil Tensiometer (PT) the ceramic tip will be dry. Prior to use, the Ceramic Tip must be properly wetted to prevent trapping air bubbles in its pores. To prepare the Ceramic Tip for use follow the steps below:

- Open the Bottle containing previously prepared Air-Free Water.
- Slowly place the PT in the Air Free Water Bottle. The water level must be high enough to completely submerge the Ceramic Tip.
- NOTE: Do not stir or disturb the water, otherwise air will dissolve into the water.
- Make sure that both the Vent Port and the Filling Port of the PT are open. Remove the Clamping Rings from the Port Tubes if necessary.
- Leave the PT sit in the Bottle until the water level rises in the TP cavity (see figure below).



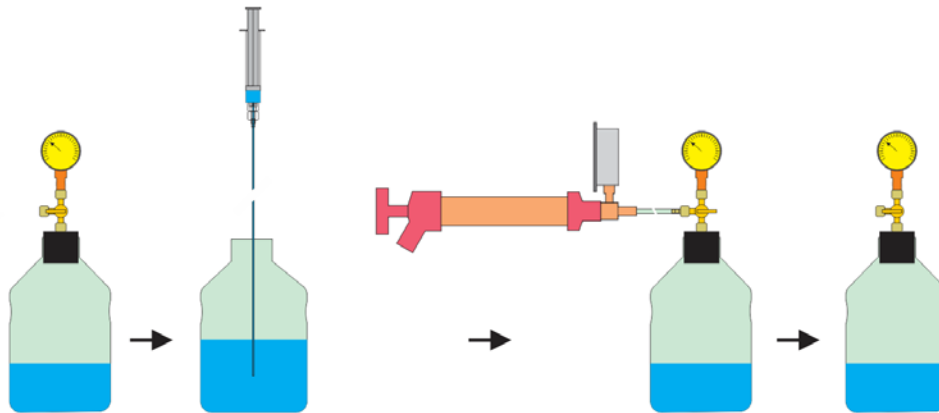
- Now the ceramic tip will be properly wetted for use and only a minimal amount of air bubbles may be trapped in the ceramic pores.

NOTE: After the PT is ready for use, we recommend you maintain a vacuum charge on the Air-free Water Bottle for future use.

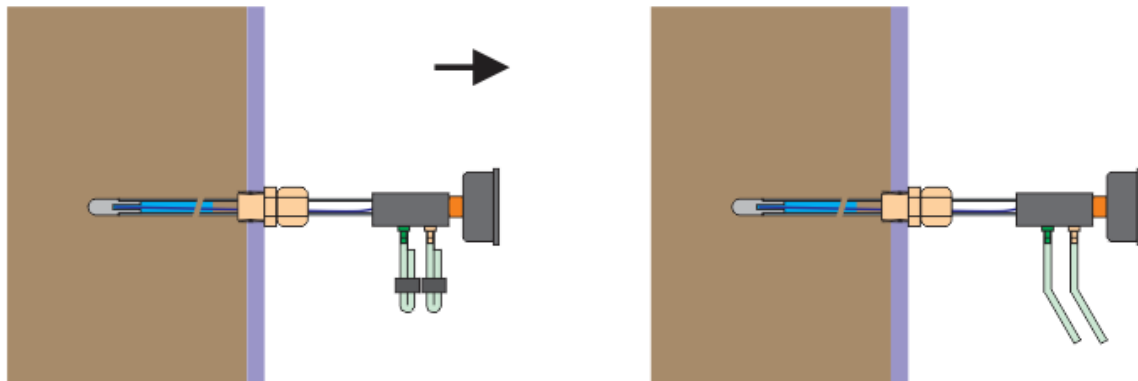
NOTE: Never expose a dry ceramic part to water from inside and outside at the same time. This will trap a considerable amount of air in the ceramic pores and reduce the PT's accuracy. Always use Air-Free Water for wetting the Ceramic Tip.

FILLING THE PENCIL TENSIOMETER

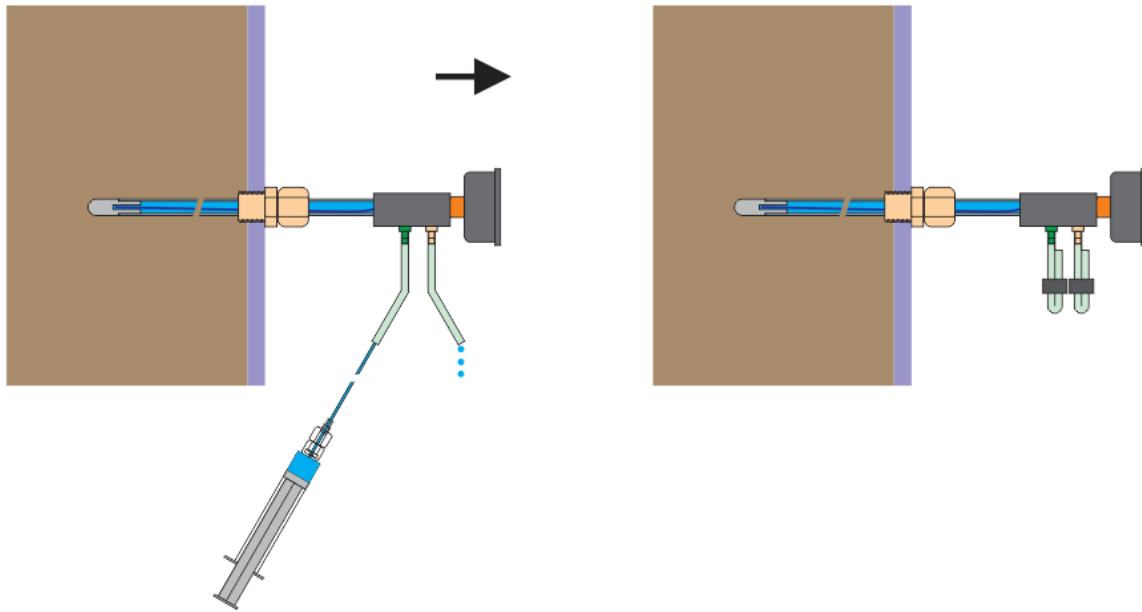
- Open the Air-Free Water Bottle with prepared Air Free Water.
- Using the supplied syringe, slowly pull about 20 ml of Air-Free Water into the syringe. Remember that air dissolves in water by creating a disturbance on the water surface.
- Reseal the Bottle. Using the Vacuum Pump, apply approximately 0.7 bars vacuum to the Air-Free Water Bottle.
- Make sure that there are no bubbles in the Syringe Tube.



- If the ceramic tip of the PT is dry, refer to the wetting instructions above before use.
- Make sure that both the Vent Port and Filling Port of the PT are open. Remove the Clamping Rings from the port tubes if necessary.

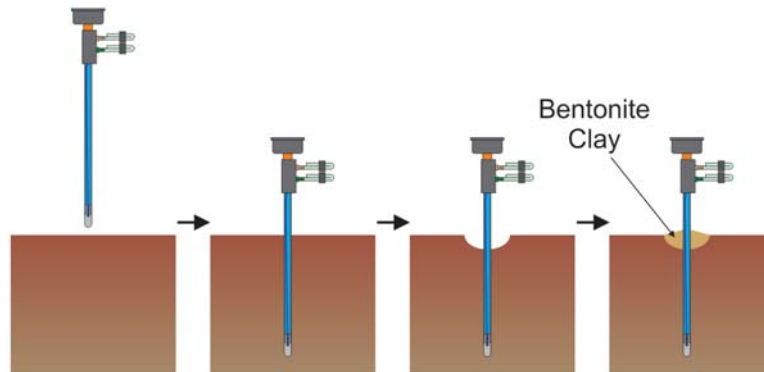


- Connect the Syringe Tube to the Filling Port Tube. If the PT is already installed, take special care not to move it. Moving the PT may disturb the hydraulic connection between Ceramic Tip and the soil profile.
- Slowly inject water into the PT cavity and fill completely. Continue injecting water until water comes out of the Vent Port. Try to get rid of all air bubbles in the PT cavity.
- Disconnect the Syringe Assembly from the Filling Port.
- Seal the Filling Port using a Clamping Ring.
- Seal the Vent Port using a Clamping Ring.

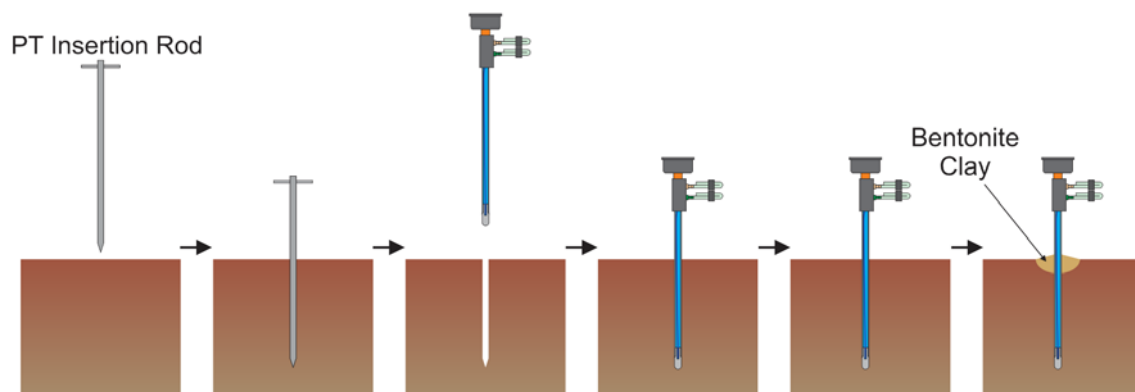


PENCIL TENSIOMETER INSTALLATION

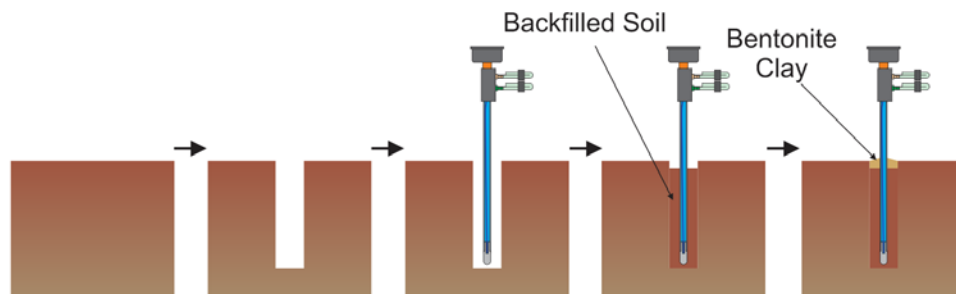
In most cases the PT can simply be pushed into the soil profile or soil column. Adding a layer of Bentonite Clay at the soil surface will seal the gap between the PT Body Tube and the soil surface to prevent preferential flow.



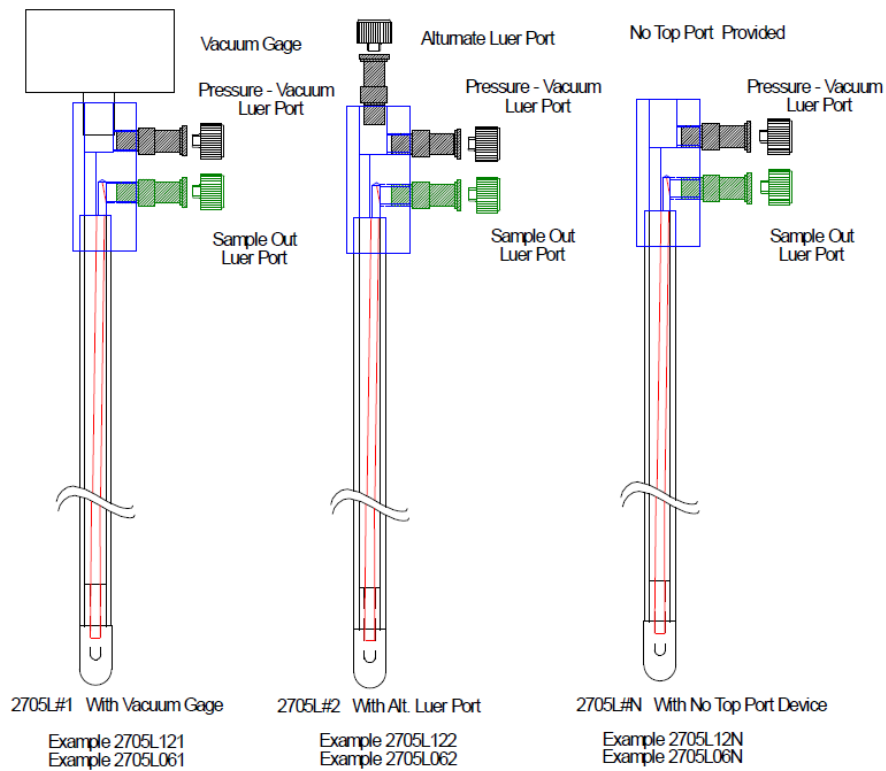
If the soil is too hard or has rocks, first hammer Insertion Rod into the soil profile to the proper depth. Then insert the PT in the hole created by the Insertion.



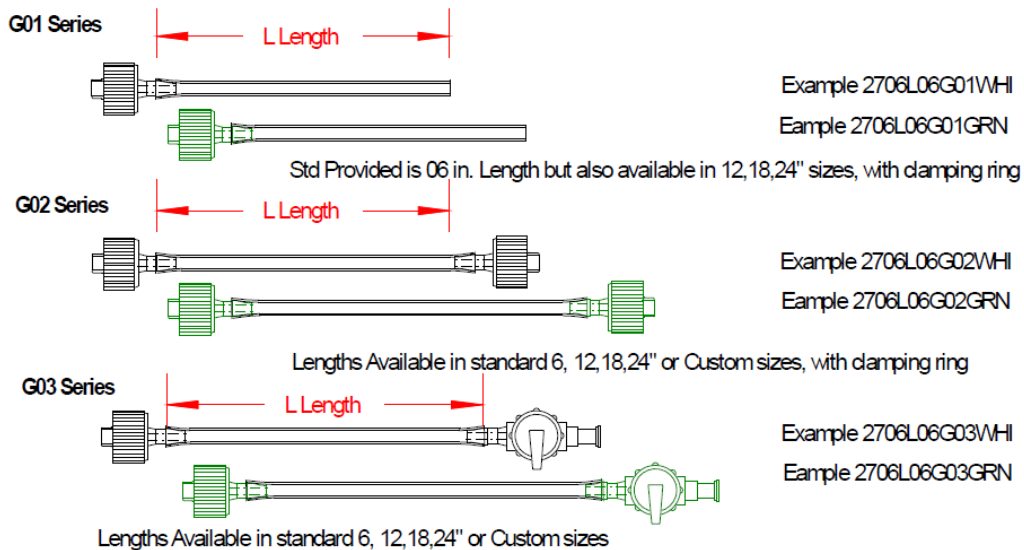
An alternative method for installing a PT is to bore a large diameter borehole (3 to 4 inches), insert the PT and then backfill the borehole to the same soil and bulk density. Always saturate and fill the PT with air-free water prior to installation.



2705L# Pencil Tensiometer/Sampler Assemblies Available



Pencil Tensiometer/Sampler Accessory Items Available



**With dealers throughout the world,
you have convenience of purchase and assurance
of after sales service.**



