

Tensiometers

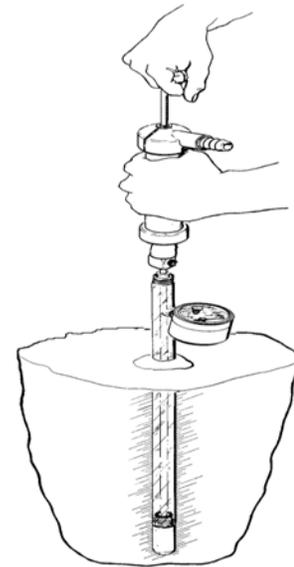
Installation

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Tensiometers are used in the landscape to measure soil moisture levels. They should be installed in the root zone of plants that are subject to stress in soils prone to moisture extremes. Potential installation areas include soils which may be too wet or dry, new plantings, trees in construction areas and trees and shrubs with root disease.

For more routine measurements, tensiometers may be installed near the trunks of important trees, within hedgerows, or near the base of any important plant. These locations will provide information on existing irrigation programs and, if used to regulate the irrigation timing, can significantly reduce water use.

Care should be taken in tensiometer placement so they will not be damaged. This usually means installing in mulch or bare soil where no mowers or other machinery will hit them. For installation in turf, use a square cinder block, control valve box or other means to protect the tensiometer. If a control valve box is used, the tensiometer should be installed horizontally rather than vertically so that the box does not reduce the amount of precipitation reaching the soil. Twisting the gauge 90 degrees will allow reading of the meter.



Once installed, the tensiometer should remain in place for as long as the moisture needs to be monitored in that area. It must, however, be removed before subfreezing temperatures.

Installation Instructions

Firmly attach the ceramic tip and vacuum gauge to the tensiometer tube. Both 'O' rings must be installed properly for the tensiometer to work. Often, the gauge 'O' rings are not tightly seated which causes air to enter. Fill the tensiometer with *Soilmoisture blue fluid* solution so that the ceramic tip is saturated prior to installation.

To install a tensiometer in the selected site, remove the mulch layer to expose the soil surface. Remove a 7/8-

inch diameter soil core to a depth of six inches. If a longer tensiometer is used, the depth of the core must be proportionally deeper. Save the soil in the soil sampler for later use.

Insert the tensiometer into the hole so that the ceramic tip contacts the bottom of the hole and the gauge is just above the soil surface. Seal around the tube using the soil removed by the soil probe. This will reduce movement of water along the tube from rain or irrigation.

Once inserted into the soil:

1. Remove the plastic cap from the top of the tensiometer and refill with *Soilmoisture blue fluid*, if needed. 2. Attach the screw cup at the end of the neoprene tubing of the vacuum hand pump to the top of the tensiometer. Pull the vacuum pump handle at least three times. Bubbles should be seen leaving the inside of the vacuum gauge. If bubbles are seen coming from the below ground portion of the tube or from the stem of the vacuum gauge there is a problem which will need to be corrected. The problem may be a poorly seated 'O' ring or improper contact with the soil due to the use of an oversized soil probe. Refill the tube again if the level of *Soilmoisture blue fluid* has dropped. Replace the cap.

The tensiometer should reach equilibrium with the soil within 60 minutes of installation. At that time, an accurate reading can be made.

Equipment Requirements

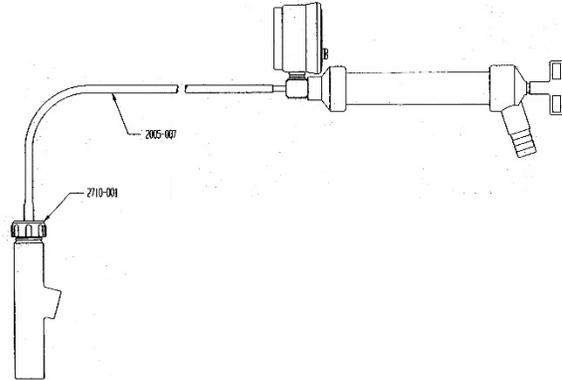
The following equipment is necessary for tensiometer installation:

1. 7/8 inch diameter soil probe #401.04.
2. A plastic squeeze bottle with a 1/8-inch O.D. tube containing tensiometer fluid composed of water plus *Soilmoisture blue fluid concentrate*.
3. A vacuum pump capable of drawing 100 centibar of pressure from a tensiometer model #2005G1.

Items 2 and 3 are available as a Service and Installation Kit #2710K1.

Pump Attachment

Please note that the method of attaching the vacuum hand pump to the tensiometer for removal of air from the tensiometer has changed.



The new method is as follows:

1. Remove the cap from the tensiometer.
2. Attach the screw cap (2710-001) to the tensiometer.
3. Insert the tip of the adapter fitting on the pump into the neoprene tubing (2005-007).
4. Follow the instructions on page 2 of the operating instructions for the model 2005G1 vacuum hand pump, model 2005G2 vacuum test hand pump for the removal of air from tensiometers, starting with the third sentence.



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