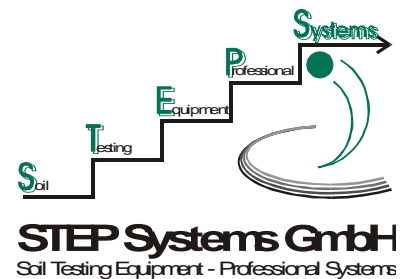


Digital Tensiometer



User Instructions for Digital Moisture Sensor

Digital tensiometer is a precision instrument for measuring soil moisture levels for both indoor and outdoor applications and for use with all soil substrates as well as clay granulate substrate. It displays the exact suction pressure that the roots need to exert in order to absorb water.

High values (for example, above 200 mbar) = dry soil
 Low values (for example, below 50 mbar) = moist soil

Installing:

1. Unscrew measuring head.
2. Soak plastic tube with ceramic tip in water for at least one hour or longer. **(DO NOT SUBMERGE MEASURING HEAD IN WATER!).**
3. Fill plastic tube to the brim with tap water.
4. Screw on measuring head until hand tight.
5. Insert into the soil.

Insertion depth: 15 – 18 cm.

Insertion position: in outer zone of roots, not too close to stem

For planting tubs: 5-8 cm from edge of tub.

By freshly re-potted plants: insert directly into the soft, new soil (not in the old root ball). Insert using a clockwise rotation, press down soil.

By dense rooting (for instance, in older planting tubs) or in very hard soil:

Pre-drill a hole in the outer root zone or remove a plug of earth (about 5-7 cm wide, 20 cm deep).

Fill hole half way with loose soil, add water, and then insert the tensiometer in the soft soil, thereby providing the ceramic tip with good soil contact. Finish by filling the hole with soil and pressing down.

After 2 – 3 hours the first measurement can be made.

Measuring:

Press "ON" briefly – Display shows the measurement in mbar for 10 seconds.

Suction Pressure Values (mbar) for plants in:				
Potting soil mbar	Garden soil, soil of average quality		Clay granulate substrate (Seramis) After re-potting First 3 months: Thereafter:	
10 – 40	30 – 150	Saturated to very moist		
50 – 120	150 – 250	Adequately moist	40 – 60	40 – 70
120 – 190	250 – 300	Moderately moist to beginning dryness (Watering should occur.)	60 – 70	70 – 100
200 – 300	310 – 500	Beginning dryness to dry (Watering absolutely necessary.)	80 – 100	110 – 150

Function

Measuring takes place via the porous ceramic tip; in dry soil, water is sucked outwards (resulting in higher values) and after watering takes place, water is sucked back into the tip (resulting in lower values). This causes a varying subpressure within the sensor, which is then measured and displayed.

The water levels in the sensor fluctuate depending upon the suction pressure. Water can be used up over time when instrument is used to measure constantly in ranges above 500 mbar. This typically results in measurements of "0" or very slow reaction times. Check the water level in the plastic tube in saturated soil and, if necessary, refill to the brim.

Transferring:

The digital tensiometer can remain in the soil substrate; however, it can also be transferred to other plants. It is best to prepare a hole in advance (see Installing) and then re-insert. Allow the tensiometer once again 2-3 hours adjusting time in order to achieve exact measuring results.

Over-wintering/ Maintenance

Remove measuring head and store frost-free. The ceramic sensor can remain in the earth; the water will simply flow through. If, after years of use, the sensor reacts more slowly than normal, then simply sand the dry ceramic sensor vigorously with sandpaper.

Possible Readings in the Display:

10 – 750	Normal measuring results in mbar.
0	Indicates air leak. Re-fill sensor with water and screw on again.
ERR	Over-pressure in the sensor after unscrewing the measuring piece, disappears automatically after a few minutes.
750 (blinking)	Measurement over 750 mbar, soil extremely dry, danger of water loss in the sensor, disappears automatically after plants have been watered.
Battery symbol (blinking)	Indicates weak battery

Readings during Testing Procedure (without the plastic tube)

0	System okay
ERR, 10, 20	Re-setting of 0-position necessary. For surrounding temperatures between 22 and 28°C briefly press "ON" button, after display of false reading press "ON" button until "ooo" appears. System should function normally again.

Changing the battery

Unscrew bottom of measuring head with a Phillips screwdriver, press the metal bracket holding the battery backwards until the battery is released. Replace with new battery (Lithium 3V CR 2032) and screw sensor together again. Take care that the positioning flap is correctly in place.