T8

Pressure Transducer Tensiometer

- **Integrated amplifier**
- **Integrated soil temperature sensor**
- **External refilling**
- **Filling status indicator**

The T8 is characterised by maximum user comfort. As an advancement of the well-proven T6, the options were technically improved and are integrated in the T8 as standard:

Integrated amplifier

✗ Offers linear and single-ended output signals 0 ... 1,85 V for water tension and soil temperature, readable by nearly any datalogger or data recording device.

✗ No special or even stabilised power supply is needed - connect the T8 directly to a battery, mains power unit, ...

✗ Extension cables up to 100 m can be connected, the electromagnetic sensitivity (EMC) is minimised.

Improved soil temperature measurement

✗ The tip of the highly accurate Pt1000 temperature sensor dips directly into the Tensiometer cup's water resulting in the best possible thermal contact to the soil.

External refilling

✗ Through two capillary tubes the T8 can be refilled respectively deaerated without removing it from the soil.

Improved IR-fill level indicator

✗ The filling status of a T8 in a downwardly installation can be checked without removing the Tensiometer from the soil: a photo-sensor will detect bubbles and turn a switch from "0V" (switch is open) for correct filling to "V_{supply}" (power supply voltage, switch is closed) indicating that the Tensiometer needs to be refilled. The IR-"switch" can be burdened with 50 mA, so LEDs or relays can be connected for alarms or quality assurance.

✗ The IR-indicator threshold value is programmable.

Internal EPROM and digital pots

✗ The calibration data is stored and can be programmed for re-calibration, recalibration is performed via digital pots and an INFIELD7 unit.

Long-lasting quality

✗ All electronic components integrated in the sensor body, made of glass-fibre reinforced synthetic, are completely covered with epoxy resin - the optimal and everlasting protection against moisture and corrosion.

✗ Custom made UMS ceramic cups have a guaranteed homogeneous porosity, bubble point higher than 6000 hPa and good water conductivity but gas impermeability. Extremely high firmness making it much more durable than conventional porous ceramics. Withstands even frost.

Why Tensiometers?

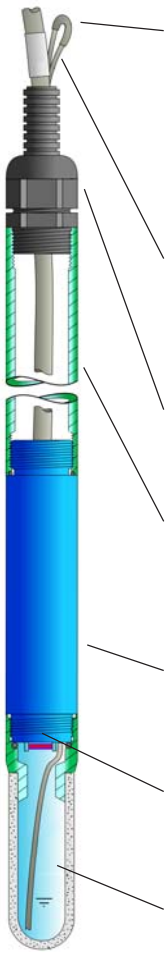
All water movements in the soil are directly depending on the soil water tension, as water will always move from the lower to the higher potential.

Compared to other methods, only with Tensiometers ...

- the sum of the water holding forces is measured,
- no knowledge of the soil's pF-characteristic and no soil calibration is necessary,
- installation disturbances are inhibited as the measured volume is much higher, ...

A few of many applications:

- Studies on drain water, ascending or lateral water and infiltration processes
- Agricultural and forest research on plant water availability and plant physiology
- Water balance and transport studies
- Layer impermeability in landfill and dumpsites
- Regulation of irrigation systems
- Control sensor for soil water extraction systems
- Monitoring studies with data-logger or fieldbus
- Lysimeter sites
- Ecological conservation of evidence



External refilling
Installed Tensiometers, if still saturated, are refilled or deaerated through two stainless steel capillary tubes. The tubes can be extended. Using the supplied refilling syringe a measuring range of approx. 800 hPa can be achieved. With the optional refilling tools, the full range can be refurbished.

Reference pressure
The reference atmospheric pressure is conducted through a watertight membrane on the cable and the cable interior. The membrane must always have contact to atmosphere.

Cable gland
The T8 can be buried completely. Special cable glands can be fixed for a watertight connection of optionally available protective tubes.

Acrylic glass shaft
One-piece shafts can have any length from 10 to 200 cm. Over 200 cm, the shafts are dividable. More or less "unlimited" shaft extension is possible.

Sensor body with amplifier
No stabilised power supply is required! Connect the T8 directly to a rechargeable battery, mains power unit, etc.

Sensor area
Position of the pressure transducer inlet, IR-indicator, temperature probe and first refilling tube opening.

High-grade ceramic cup
Water filled, with second end of refilling tube.

Technical Specifications

Soil water tension

0 ... 1,850 V	corresponds to -1000 ... +850 hPa
Accuracy	± 5 hPa

Temperature sensor

0 ... 2 V	corresponds to -30 ... +70°C
Accuracy	± 0,2 K (-10°C ... +10°C)
	± 0,4 K (-30°C ... +30°C)

IR-Indicator switch

0 V or U_{supply}	Filling status "ok" or "insufficient"

Power supply	6 ... 20 V_{DC}
Current consumption	7 mA
Ceramic cup	∅ 24 mm; length 60 mm
Shaft	∅ 25 mm; PMMA
Plug	male, 8-pin, M12/IP67

Ordering information	*Art. no.*
Pressure Transducer Tensiometer	**T8-...***

* *Note **shaft length** on an order, total length = shaft + 16 cm*

Cable length on sensor body:
for shafts up to 120 cm: 1,5 m from sensor body
for shafts over 120 cm: 5 m from sensor body
Effective cable length is cable length minus shaft length.
The reference air membrane is fixed close to the plug.
Order connecting cables separately.

Contents of supply: T8 (filled), user manual, shaft water retaining disc, refilling syringe, calibration certificate

Accessories

Connecting cables

Each T8 is fitted with a watertight 8-pin male plug connector, type M12/IP67. Separately ordered connecting cables have a female plug and free wire ends. Extension cables have one male and one female plug.

External refilling kit

To reach a measuring range of 900 hPa or if the refilling tubes are longer than 5 m (!), the *BKTex* refilling kit for in-the-field use is available. Incl. manual vacuum pump, vacuum bottle, syringe.

Laboratory refilling kit

For a total degassing of ceramic cup and pressure sensor, the Tensiometers should be refilled in the laboratory with the laboratory refill kit *BKT468* and a vacuum pump (not incl., min. 8 mbar).

INFIELD7 handheld unit

The *INFIELD7* handheld read-out device is used for spot readings of the soil water tension (in hPa), the soil temperature and the filling status. 250 readings can be stored. In combination with the laboratory refill kit, T8 can be re-calibrated with the INFIELD7.
The INFIELD7 reads out all UMS Tensiometers, but also certain types of gypsum blocks, temperature and FD-probes (volumetric water content).

Gouge auger set TB-25

The gouge auger has a specially shaped tapered blade tip for an accurate fitting of the cup in the borehole - the slurrying of the cup becomes unnecessary.

Ordering information accessories	*Art. no.*
Connecting cable, 5 m *(plug to wire ends)*	**CC-8/5**
Connecting cable, 10 m	**CC-8/10**
Connecting cable, 20 m	**CC-8/20**
Extension cable, 5 m *(plug to plug)*	**EC-8/5**
Extension cable, 10 m	**EC-8/10**
Extension cable, 20 m	**EC-8/20**
Handheld measuring device	**INFIELD7**
Refill kit with manual vacuum pump	**BKTex**
Laboratory refill kit *(without pump)*	**BKT456**
Gouge auger set	**TB-25**

Product Info
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