Soil moisture catalogue

All it takes for **environmental** research

Eijkelkamp
Agrisearch Equipment

Eijkelkamp Agrisearch Equipment BV, a subsidiary of Eijkelkamp Earth Sampling Group BV, is an international organisation that supplies an extensive range of equipment, consumables and materials for environmental and agricultural research. This brochure provides information about our range of products for measuring soil moisture, soil moisture tension and related parameters.

If this brochure does not include the product you are looking for, please request the complete Eijkelkamp product catalogue or contact us.

Call +31 313 88 02 00 or email info@eijkelkamp.com

Soil moisture; for a liveable world

Soil moisture has an all-determining influence on our life on earth. It ensures that trees and crops can grow, that roads and green hillsides are stable and that we are not permanently enveloped in dust storms. A wide range of measures can influence soil hydrology. Therefore, measuring the amount of soil moisture is extremely important for nature management and the maintenance of plants and soil. The chemical composition of the moisture in the pores of the soil is important for agriculture and for the prevention of future groundwater pollution. This is why this brochure also addresses this subject (see 'Rhizon soil moisture samplers' on page 12).

Two measurement principles must be distinguished for measuring soil moisture:

- moisture present in the soil expressed as a percentage of volume or weight
- moisture available for plant growth and soil stability expressed as the soil moisture tension

If the moisture characteristic (pF) of the soil is known, it is still possible to derive a soil moisture tension based on a percentage volume measurement and then measures can be taken (for instance irrigation). By carrying out measurements, decisions about the measures to take can be better substantiated and the effects evaluated. Everytime we use the term moisture percentage -or just %- in this brochure, we mean volume percentage soil moisture. This the percentage soil moisture in undisturbed soil. 50% means 500 litre water per 100 litre soil or 0.5 m^3 water/m^3 soil. The soil moisture value is also an important parameter for geo engineering. Soil moisture influences the soil shear strength (landslides), compaction options, dust formation and soil mass. The amount of soil moisture determines when certain earth-related activities (excavation) can be carried out. A soil moisture measurement is required (in the Netherlands) when sampling, transporting and dumping various products (including soil suspected of containing asbestos).

For every user, suitable equipment is available to allow the soil moisture or soil moisture tension to be measured. Eijkelkamp Agrisearch Equipment's sales staff and the Eijkelkamp-trained distributors can, together with you and based on your wishes, help you to choose the correct method and equipment. In addition, the Product Knowledge Database (PKD) on www.eijkelkamp.com can be of assistance.

To measure the current situation in the soil, manual measuring equipment can be used, while for on-going research moisture sensors with a logger are ideal. A series of historic data can be used to study the soil moisture and external conditions (e.g. evaporation, drought, rainfall) can be assessed. Using additional telemetry, the measurement data (including alarms) can be sent to the location you desire. Based on the current measurement values, measures can be taken quickly (e.g. open irrigation channels, turn on sprinklers, lower the groundwater table). Even a fully automated system for an irrigation installation is possible.

Applications:

Possible applications for the equipment described in this brochure:

- Measuring soil moisture and soil moisture tension for forestry, cultivation and agriculture
- Monitoring the moisture situation of recently planted trees and large old trees (telemetrically if desired)
- Measuring soil moisture and conductivity in areas with a high natural salt load
- Measuring soil moisture to allow the groundwater table to be controlled for the benefit of agriculture and nature
- Measuring soil moisture to control irrigation
- Researching trends in moisture profiles during the growing season
- Measuring soil moisture for hydrological research into the total water chain
- Studying the stability of embankments and inclines
- Sampling soil moisture for analysing the soil quality

Overview of instruments

This brochure covers the following instruments:

1. **Soil moisture sensors (volumetric) and the associated data loggers**
2. **Tensiometers including readout units**
3. **Rhizon soil moisture samplers**

1 Soil moisture sensors and the associated loggers

1.1 Frequency Domain soil moisture sensors

11.41.11.SA e+ SOIL MCT sensor/logger

The e+ SOIL MCT sensor is one of the products in the Eijkelkamp e+ sensor range. This compact sensor measures volumetric soil moisture, soil conductivity and temperature. The measured data are stored in the internal logger and can be read out via the e-SENSE® telemetric system, directly through the e+ CONTROL readout unit or by using a laptop.

The sensor uses the 'Frequency Domain (FD) Method' measurement principle, as described by the Wageningen University and Research centre (Van Balendonck and Hillhorst). The soil moisture content can be derived based on the measured dielectric constant of the soil. The sensor contains a special chip, developed by Agrotechnology & Food Innovations, a data logger with integrated software to facilitate a wide range of usage options and batteries for long-term use.

The sensor derives the following parameters from the measured values of permittivity and conductivity
- Volumetric soil moisture
- Bulk soil conductivity (ECb)
- Soil temperature

The standard set (sensor/ logger including required battery) is suitable for taking measurements at surface level. Longer sensors are available for depths down to 1 metre.

14.26 Soil moisture meter with Thetaprobe

The Thetaprobe used to take soil moisture measurements determines the percentage of soil moisture using the Frequency Domain (FD) Method as previously mentioned. The sensor consists of a robust, watertight plastic housing that contains the electronics and is equipped with four stainless steel measuring probes that can be easily pushed into the soil. The measurement data can be read using a hand-held meter or be logged using a data logger.

Measurement range:	0...50% [1]
Accuracy:	± 1% for soil specific calibration [2]
Signal:	0...1 V [3]

Remarks:
[1]: 0...100% for reduced accuracy
[2]: ± 1% for soil specific calibration
[3]: corresponding to 0...50%

The standard set consists of a Thetaprobe sensor, the HH2 hand-held meter, a manual gauge used to guide the measuring probes into the soil, spare measuring probes and a carrying/ storage case.

14.26.82 Soil moisture profile probe

Using the profile probe, the soil moisture can be measured at multiple depths at the same time. Four to six sensors are integrated in a single sensor housing. The short profile probe is suitable for measuring at four depths (up to 40 cm) in the shallower root zones, while the longer profile probe has two additional sensors (60 and 100 cm) for the deeper root zone. To take a measurement, the probe is slid into a preinstalled, thin-wall glass-fibre tube.

Measurement range:	0...40% [1]
Accuracy:	± 4%
Signal:	0...1 V [2]

Remarks:
[1]: 0...100% for reduced accuracy
[2]: corresponding to 0...60%

14.24 Soil moisture meter with an SM200-sensor

In the past, choosing to use an economically priced soil moisture sensor meant compromising stability and accuracy. The SM200 soil moisture sensor offers good temperature stability and low sensitivity to salts or fertilisers dissolved in the soil moisture. Therefore, the SM200 can measure the soil moisture accurately and it is attractively priced.
The HH2 soil moisture meter can also be used for measurements with the SM200 sensor. Multiple SM200 sensors can be connected to a data logger.

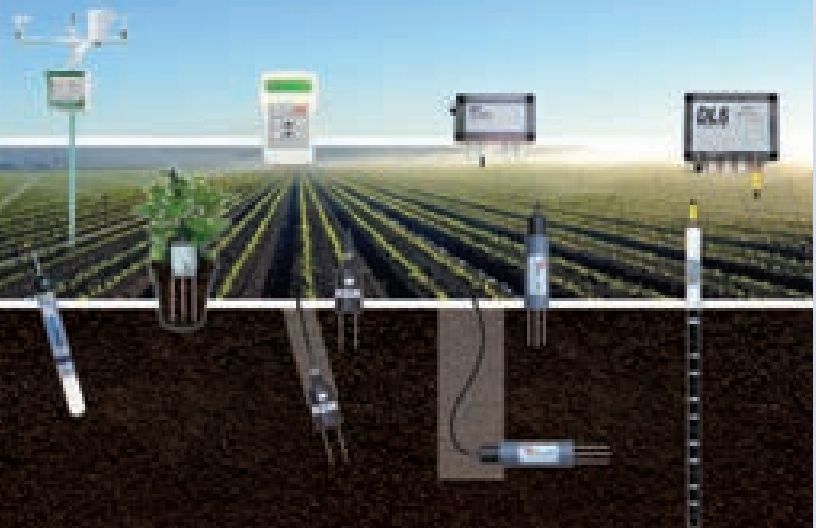
Measurement range:	0...50% [1]
Accuracy:	± 3%
Signal:	0...1 V [2]

Remarks:
[1]: 0...100% for reduced accuracy
[2]: corresponding to 0...50%

19.33 WET sensor

The WET sensor measures three important soil properties: soil moisture, electrical conductivity and temperature. The WET sensor is also based on the 'Frequency Domain (FD) Method'. As the electrical conductivity and temperature are also measured, the WET sensor is also extremely suitable for monitoring the fertilisers in the soil or cultivation medium. Irrigation and fertilisation advice can therefore be given based on more insight and with increased accuracy. The measurement volume is rather small, which makes it possible to also take measurements in (larger) pot plants. The WET sensor can be connected to a hand-held readout unit and a data logger.

Soil moisture measurement range:	0...100% (± 3%)
Conductivity measurement range:	0...300 mS/cm (± 10 mS/cm)
Temperature measurement range:	-5...50 °C (± 1.5 °C)



14.26.02 Soil moisture meter HH2 (hand-held readout unit)

The HH2 soil moisture meter is used to take manual measurements using the Thetaprobe, WET sensor, Profile probe and SM200 soil moisture sensors. The readings from the HH2 soil moisture meter can be read via a laptop and (free) software. The hand meter has a capacity of 500 to 1,500 measurements (sensor-dependent). The soil types can be set (mineral, organic) in the menu of the HH2 hand meter. In addition, it is possible to set soil specific calibration curves. Together with one of the sensors mentioned above, a measurement value can be rapidly obtained.

21.12.01 GP1 Data Logger

The attractively priced GP1 Data Logger can log the measurement values of the Thetaprobes, SM200 and WET sensors at specified measurement intervals. This weather-resistant logger can store a maximum of 600,000 measurement values and, if extended with a GSM modem, can also make the measurement data available immediately. The logger can be powered by batteries, an external power supply or a solar panel.

The GP1 logger can be used to log the measurement data from multiple soil moisture sensors. Dependent on the application, one to five soil moisture sensors, two temperature sensors and two counter sensors (for instance a rain meter) can be connected. The fact that the GP1 loggers can be interconnected allows a complete network to be built.

Each GP1 logger has an intelligent relay. Limit values for the sensors can be set In the software. If these values are exceeded, the intelligent relay can be activated. The relay can be used with a delay, which makes it also very suitable for irrigation purposes. Incidentally, the GP1 logger can also be used for various other purposes, for instance in a weather station.

14.26.04 DL6 Data Logger

The DL6 Data Logger can log the measurement values of the Thetaprobes, SM200 and WET sensors and profile probes at specified measurement intervals. This weather-resistant logger can store a maximum of 16,000 measurement values and, if extended with a GSM modem, can also make the measurement data available immediately. The logger is powered by batteries.

The DL6 logger can log the measurement values of at the maximum six soil moisture sensors, one soil temperature sensor and one counter sensor. The fact that the DL6 loggers can be interconnected allows a complete network to be built.

Each DL6 logger has an intelligent relay. Limit values for the sensors can be set In the software. If these values are exceeded, the intelligent relay can be activated. The relay can be used with a delay, which makes it also very suitable for irrigation purposes.

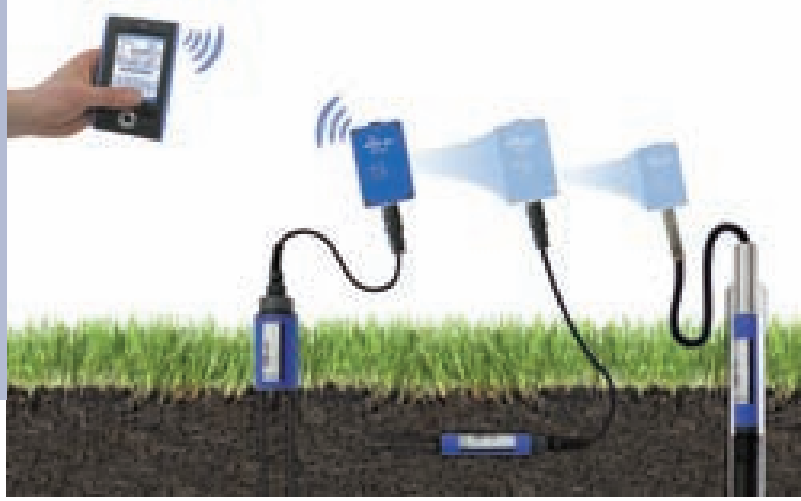
21.11.01 DL2e Data Logger

The DL2e Data Logger can log the measurement values of the Thetaprobes, SM200 and WET sensors and profile probes at specified measurement intervals. This weather-resistant logger can store a maximum of 128,000 measurement values and, if extended with a GSM modem, can also make the measurement data available immediately. The logger can be powered by batteries, an external power supply or a solar panel.

The DL2e data logger distinguishes itself by the large number of channels that are available. There are up to 60 analog/ digital channels available, two counter channels (extension optional) and two relays. Therefore, this logger is mainly used to connect a lot of sensors at a compact location.

The DL2e data logger is also used for weather stations that have many sensors.

1.2. Time Domain Reflectrometry soil moisture sensors



14.65 TRIME-PICO soil moisture measurement system (TDR method)
The TRIME-PICO soil moisture measurement system is a total solution for taking and recording soil moisture and temperature measurements simply in the field. It uses the advanced and accurate Time Domain Reflectrometry technology. TDR measurement technology measures with a higher accuracy than the FD technology and is also suitable for other media than soil (for instance substrates, nutrients, etc.)

The sensor generates an electrical pulse in the soil. The pulse reflected by the soil is received by the sensor and converted into a measurement signal. The shape of the reflected pulse strongly depends on the amount of moisture in the medium around the probes. With this device, the permittivity of the soil can be rapidly and accurately (to 2%) determined. The associated PICO sensors (available in various versions) can be used in a mobile way and the measurement data can be read out and stored in the Bluetooth module (including software). The system has been specially developed for use in the field under the most extreme conditions. Communication between the Bluetooth module and the PDA is possible up to at the maximum 10 metres.

The above picture shows all components of the TRIME-PICO soil moisture measurement system.

14.65.06 PICO64 sensor
The PICO64 sensor is a soil moisture sensor with an integrated system for measuring the temperature of the soil. This sensor measures a large volume of more than 1,250 ml soil, as a result of which (even in heterogeneous soils) representative and accurate measurements can be obtained. The PICO64 sensor is simply pushed into the soil or can be buried horizontally.

The intelligence of the PICO sensor is in the sensor itself, so that it does not need to be directly connected to specific readout equipment. Therefore, these sensors can also be connected to standard data loggers (0...1 V).

The PICO64 sensor can be used in soils with a conductivity of up to 1,200 mS/m and a soil moisture content up to 100%. For soils with a conductivity of 1,200 to 5,000 mS/cm a soil specific calibration can be carried out. The soil moisture content can be measured with an accuracy of 1% (up to 40% soil moisture) or 2% (up to 70% soil moisture). In addition to soil moisture, the temperature is also measured (-15...+50 °C).

14.65.03 PICO32 sensor
The PICO32 sensor is a smaller variant of the PICO64. Due to its compact size, it is even easier to push it into the soil. The measurement volume, with at the maximum 250 ml soil, is considerably smaller than that of the PICO64, which makes it possible to take measurements in thinner layers and smaller volumes (pots). The PICO32 sensor is ideal for monitoring irrigation systems and perfect for use in sandy and peaty homogeneous soils.

The intelligence of the PICO sensor is in the sensor itself, so that it does not need to be directly connected to specific readout equipment. Therefore, these sensors can also be connected to standard data loggers (0...1 V).

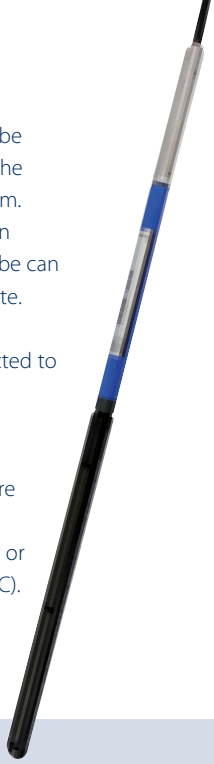
The PICO32 sensor can be used in soils with a conductivity of up to 1,200 mS/m and a soil moisture content up to 100%. For soils with a conductivity of 1,200 to 5,000 mS/cm a soil specific calibration can be carried out. The soil moisture content can be measured with an accuracy of 1% (up to 40% soil moisture) or 2% (up to 70% soil moisture). In addition to soil moisture, the temperature is also measured (-15...+50 °C).

14.65.08 PICO IPH/T3 tube sensor

This sensor makes it possible to rapidly and reliably measure complete soil moisture profiles. A PICO tube sensor has a cylindrical PVC housing that can resist extreme measuring conditions. The tube in which the measurements occur must be installed in the soil in advance, using a specially developed drilling system. These tubes are installed at a maximum depth of three metres, after which measurements can be taken using the tube sensor at any desired depth in the tube. When removing the tube sensor, the plastic tube can be sealed with a cap and left in the soil without problem for a possible next measurement at a later date.

The intelligence of the PICO sensor is in the sensor itself, so that it does not need to be directly connected to specific readout equipment. Therefore, these sensors can also be connected to standard data loggers (0...1 V).

The PICO IPH/T3 sensor can be used in soils with a conductivity of up to 1,200 mS/m and a soil moisture content up to 100%. For soils with a conductivity of 1,200 to 5,000 mS/cm, an adapted tube sensor is supplied. The soil moisture content can be measured with an accuracy of 2% (up to 40% soil moisture) or 3% (up to 70% soil moisture). In addition to soil moisture, the temperature is also measured (-15...+50 °C).



14.65.01 PICO Bluetooth measurement module

A single PICO Bluetooth measurement module can collect the data from a variety of sensors at various locations. The measurement module is physically connected to the PICO sensor that is to be read. The internal battery of the Bluetooth module then also serves as the power supply for the PICO sensor. The measurement values can be read using a robust PDA (can be supplied) and PICO-TALK software. The software recognises the serial number of the connected sensor and stores its data in the system.

14.65.01 PDA

Using the supplied PDA and Bluetooth, a wireless connection can be made with the Bluetooth measurement module.

14.65.SA Standard set

A PICO64 sensor with the associated Bluetooth measurement module (incl. software) and PDA is recommended as the standard measurement system.

Special sensors are available on request for special applications, such as measuring moisture content in other materials (e.g. grain, compost). These sensors can also be built into drying systems.

In addition, an intelligent and very easily extendable data logger can be supplied: the GlobeLogger. All of the TDR sensors can be connected to the GlobeLogger, so that the measurement data can be monitored and tracked, even in real time (GPRS). An intelligent extension set can be used to connect a large number of digital, analog and pulse sensors.

14.63.SA MiniTrase Kit

The MiniTrase Kit is a complete kit for measuring and storing moisture data, using the TDR technology. The meter has a measurement range of 0 – 100 volume percent moisture and is supplied together with a multiplexer card, standard connector for wave guides, Palm IIIC computer, battery, cables and charging equipment. It also includes software for downloading and using data on the PC.

The meter has sufficient memory to store 200 graphs or 6,300 measurement values. The rechargeable battery has sufficient capacity to take approximately 750 manual or 1,500 automatic measurements. Due to its low weight and compact size, the MiniTrase can easily be transported in the supplied backpack.

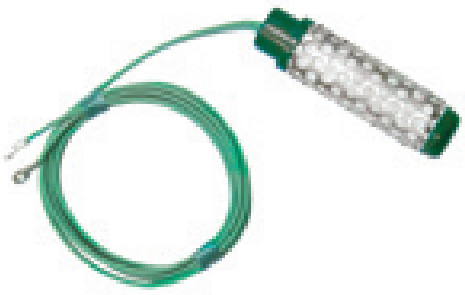
1.3 Other sensors

14.27 Watermark soil moisture meter

In contrast to all of the equipment mentioned above, this device does not measure the soil moisture, but the soil moisture tension between the soil particles (which has relevance with respect to plant growth and soil stability). The Watermark system is a much-improved alternative to the classic gypsum blocks. The sensors do not dissolve in the soil and are insensitive to salt. In addition, they monitor the current situation in the soil much faster. An alternating current is applied to a sensor that is sensitive to soil moisture tension. The soil moisture meter converts the impedance measured into a soil moisture tension measurement in kPa. By entering a soil temperature measurement, the measured moisture tension can be corrected for the actual temperature.

Watermark sensors

A precondition that must be satisfied to allow reliable measurements to be taken is optimum contact between the sensor and the soil. After first being wetted, the sensors (measurement range 0...200 kPa) are buried permanently in the soil and have an average life of 3 - 5 years. In addition, a model is available that is installed in a tube making it easy to insert it into a small bore hole.

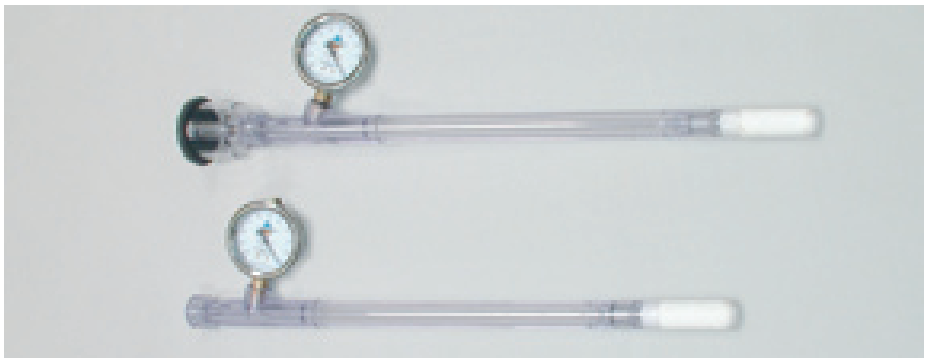


The Watermark system is extremely suitable for use for extensive crops or for monitoring young tree plantations. The meter can also be replaced by a special easy-to-operate data logger for a maximum of six sensors.

The soil moisture sensors can be used in most irrigation systems for agricultural and landscape irrigation as a replacement for tensiometers. The advantage when compared to a tensiometer is that the sensors require no maintenance, have a considerably larger measurement range and can be included in an automated measuring system.

2 Tensiometers including readout unit(s)

The most simple and most frequently employed method for determining the soil moisture tension (and with it the moisture content of unsaturated soil) directly in the field, uses the tensiometer. Tensiometers are available in various versions and can be used in mineral and organic soil types, but also in compost for pot plants and in other organic and inorganic substrates. The measurement range is limited (850 hPa), which makes the tensiometer mainly suitable for use when growing intensive crops in fields and greenhouses, the fruit growing sector and tree nurseries. A tensiometer directly measures the moisture stress that a plant is subject to and therefore can be used to provide immediate irrigation advice for the specific crop. Before a tensiometer is installed in the soil or a substrate, a hole must be drilled and the tensiometer filled with water and de-aerated. Tensiometers are not frost proof.



14.04.03 Standard tensiometers
The standard tensiometer consists of a transparent plastic tube with a ceramic cup on the bottom and a manometer at the top. This tensiometer, which has a screwed-in ceramic cup and soil moisture tension meter, is available in various lengths (15, 30, 60, 90, 120 and 150 cm), so that measurements can be taken at locations next to each other at various depths in the root zone.

14.04.04 Jetfill tensiometers
In essence, a Jetfill tensiometer consists of the same parts as a standard tensiometer, however, it is fitted with a water reservoir and a pump mechanism at the top. If the soil and tensiometer dry out, the tensiometer can be easily filled by pressing the button on the pump mechanism a couple of times. This will cause water to flow in and air to flow out. This tensiometer is also available in various lengths.

14.04.05 Quickdraw tensiometers
The Quickdraw tensiometer is a small tensiometer than can easily be moved and, using the supplied gouge auger, can be simply installed in the soil. The small diameter, the super porous ceramic cup and the possibility of setting the underpressure in advance allow a measurement to be taken in just a few minutes. After every measurement, the tensiometer is stored in a storage cylinder in which it remains wet and is therefore immediately available to take a following measurement.

14.04.08 Tensior 3 with electronic pressure sensor
The Tensior 3 is a tensiometer with an electronic sensor that gives a continuous measurement signal (in hPa). The measurement results are read out using a readout instrument or data logger. The tensiometer is fitted with an overpressure safety device and is available in various lengths.

The Tensior 3 has a measurement range of +100 to -700 hPa and an outgoing signal of -10 to +70 mV (+/- 3 mV). As it allows a limited positive pressure to be measured, this tensiometer is also suitable for measuring the (risk of) oversaturation (embankments, landslides). The device requires a 10.6 V direct current power supply, it consumes 1.3 mA. The tensiometers are supplied with a cable and a calibration certificate.

14.04.09 Tensior 4 with electronic pressure sensor

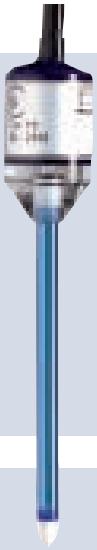
The sensor of the Tensior 4 is located at the bottom of the tensiometer tube, directly above the ceramic element. As long as this element is installed deep enough, this tensiometer can also be used in freezing conditions. The pressure sensor can simply be fitted to a tensiometer tube of a different length, making it possible to take measurements at various depths.

The Tensior 4 has a measurement range of +1,000 to -850 hPa and an outgoing signal of -100 to +85 mV (+/- 3 mV). This Tensior can measure considerable overpressures (up to 10 metres of water column) and is therefore also a valuable geotechnical measuring device that can be used to investigate the soil stability of embankments and inclines. The device requires a 10.6 V direct current power supply, it consumes 1.3 mA.

14.04.10 Tensior 5 mini-tensiometer with electronic pressure sensor

The Tensior 5 mini-tensiometer is characterised by its small ceramic cup (diameter 5 mm, surface area 0.5 cm^2) and the short length of the tube, that causes only minimum disruption of the soil. In addition, the response time is very short (seconds). The mini-tensiometer is mainly used for point measurements in soil columns, small lysimeters and pots. The sensor gives reliable measurement results and can also be used to take measurements in various positions.

The Tensior 5 has a measurement range of +1,000 to -850 hPa and an outgoing signal of -100 to +85 mV (+/- 3 mV). The Tensior 5, similar to the Tensior 4, can measure considerable overpressures (up to 10 metres of water column) and is therefore also a valuable geotechnical measuring device to investigate the flowability of soil in embankments and inclines. The device requires a 10.6 V direct current power supply, it consumes 1.3 mA.



14.04.11 Tensior 8

The Tensior 8 is characterised by its optimum range of uses and high reliability. The Tensior 8 is even more attractive for long-term research. The T8 can be filled and then de-aerated via two capillary tubes without needing to remove the device from the ground. It has an indicator that shows the filling level and a ceramic part that remains saturated up to a soil moisture tension of -15 Bar. This offers the maximum guarantee that after a dry period, this tensior can be reused without even the slightest disruption of the measurement location. The accurate temperature correction and signal amplifier ensure that the measurements are additionally stable. In addition to the usual analog signal output, the Tensior 8 is also equipped with a digital output. The measurement range is from +1,000 to -850 hPa, therefore the Tensior 8 is also suitable for use in supersaturated soil. Furthermore, it has a selectable output signal of 0-1, 0-2 or 0-5 Volt (in addition to a digital output). Power supply 6...18 Volt, 3 mA. Lengths up to 2 metres.

14.04.08.98 Infield meter (hand-held readout unit) for manually reading out tensiors

The Tensiors can be connected to the INFIELD7 readout unit. This readout unit can store 250 measurement values that can be uploaded to a PC via a USB convertor. The measurement range is -1,000...+1,000 hPa with an accuracy of 1 hPa. The INFIELD7 operates on AA batteries and can be stored in a protective cover. In addition to Tensiors, other sensors can also be connected to the INFIELD7.

The Tensiors can also be connected to a data logger. This makes it possible to build a measuring network of Tensiors, the measurement values of which can be logged over a longer period. Dependent on the data loggers, the current measurement data can also be obtained via GSM or GPRS modules.

3 Rhizon soil moisture samplers

With the Rhizon soil moisture samplers, we offer a series of miniature samplers that can be used for the repetitive and reliable sampling of all dissolved components in the soil moisture.

The porous synthetic material (PES) with a diameter of just 2.5 mm, even after drying out, will wet spontaneously. Fine pores of 0.15 µm assure a high bubble point pressure as a result of which a complete vacuum can be created. The hollow porous part that is 5 or 10 cm long is reinforced with a stainless steel, or for MOM and MACRO types, a glass-fibre reinforced core.

The stainless steel core version (type **SMS**) is in particular suitable for macro parameters and (micro)organic substances. If the required precautions are taken, the reinforced synthetic version (type **MOM**) can be used for all micro and macro parameters and dissolved organic carbon (DOC). The Rhizon soil moisture sampler model **FLEX** with nylon core can be used for inserting in pots during filling.

In addition to the just 2.5 mm thick Rhizons, we also supply MacroRhizons. These are thicker (4.5 mm) and therefore more robust (epoxy core). They can be used very effectively in the field, even down to a depth of several metres. Installation at an angle of around 45° in a drilled and gouged out small-diameter hole guarantees good contact between the soil and the porous element. Moreover, this prevents the rainwater running into the hole. Extension tubes and hoses are available for installation at greater depths.

MacroRhizons can be used for all analyses. Of course, it is possible to take repeated samples. Because the Rhizons are attractively priced, valuable large-scale studies are now within reach of every researcher.

Rhizon soil moisture samplers are supplied in the following versions:

19.21.01 Rhizon soil moisture sampler, type SMS, length 10 cm
19.21.05 Rhizon soil moisture sampler, type SMS, length 5 cm
19.21.21 Rhizon soil moisture sampler, type MOM, length 10 cm
19.21.22 Rhizon soil moisture sampler, type MOM, length 5 cm
19.21.25 Rhizon soil moisture sampler, type FLEX, length 10 cm
19.21.35 MacroRhizon soil moisture sampler, length 9 cm
19.21.36 MacroRhizon soil moisture sampler, length 9 cm, fitted with 90-cm tube

Finally

Eijkelkamp Agrisearch Equipment has complementary products in its product range for measuring many other parameters than just soil moisture, these include:

- **rain and evaporation measurements**
- **(ground)water table measurements**
- **research into soil constitution and structure**
- **soil chemistry (salt concentration and fertility)**
- **measuring sensitivity to erosion**
- **water permeability measurements**

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For more information, please go to www.eijkelkamp.com or contact us directly.

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