



MPS-6 soil water potential

tensiometer-style, no maintenance, digital sensor

overview

The MPS-6 is the latest technology in soil water potential measurements. It performs measurements similar to a tensiometer but without any of the difficulties of tensiometers. The MPS-6 has zero maintenance – install in your soil, connect to a data logger or handheld meter, and start measuring. No water columns and no refilling is required.

It supersedes old technology, such as tensiometers and gypsum blocks, because it is more reliable, accurate, requires no maintenance, and it is digital. The MPS-6 is a must have for anyone who is serious about soil water potential measurements.

The MPS-6 is a matrix water potential sensor that provides long term, maintenance-free soil water potential and temperature readings at any depth without sensitivity to salts. The range of the MPS-6 goes from field capacity to air dry. Lab and field tests indicate that it can make accurate measurements at water potentials at least as dry as permanent wilting point.

The MPS-6 features:

- **Supersedes redundant soil water potential sensors** such as tensiometers and gypsum blocks.
- **Dramatically Improved Accuracy** – Accuracy comes from the MPS-6's six point factory calibration. Compare with confidence to other MPS-6 sensors or to other measures of water potential.
- **Tough, Long-Lasting Body** – Epoxy overmolding will withstand even difficult field conditions. Sensors are rated for long-term research studies.



- **No Recalibration** – Other matrix potential sensors have a tendency to degrade over time. The MPS-6 uses a silica based ceramic material that doesn't degrade and doesn't need replacement or recalibration.
- **Insensitivity to Salts** -The sensor is accurate in salty environments, a variety of soils, and even in locations where the salinity conditions change over time.
- **Affordability** – Breakthrough calibration technique gives the MPS-6 the accuracy of an individually calibrated sensor at a price comparable to most uncalibrated sensors.
- **Excellent Range** – The MPS-6 has sensitivity from -9 kPa all the way to air dry (-100,000 kPa), with accurate measurements to at least permanent wilting point.
- **Onboard Temperature Measurement** – Temperature measurements let you evaluate another important growing condition without adding a sensor.
- **Plug and Play Capability** – Just install the sensor, plug it into the Em50 series logger, set the clock and measurement intervals, and start logging data. No programming required.
- **Remote access to data** – Use the MPS-6 with an [ZL6 data logger](#) and access your data from your office, lab, classroom, or anywhere with an internet connection.
- **SDI-12 Compatible** – The MPS-6 is compatible with nearly all major commercial data loggers through SDI-12, a universal communications protocol.

more details

MPS-6 sensors are composed of a moisture content sensor and a porous substrate with a known moisture release curve. After the porous material has equilibrated with the surrounding soil, the moisture sensor measures the water content of the porous material, and the sensor uses the moisture release curve to translate moisture content into water potential.

range vs. accuracy

A sensor's range depends on the variation in pore sizes in the porous substrate; the wider the range of pore sizes, the bigger the measurement range. Commercially

available ceramics are designed to have a uniform pore size, which limits their range. The MPS-6 uses a ceramic specifically designed with a wide pore size distribution for wider measurement range.

However, a sensor's accuracy depends on how well the moisture release curve characterizes the porous substrate in that particular sensor. The more consistent the substrate is from sensor to sensor, the more accurate each sensor will be. Widely varied pore sizes lead to inconsistency from sensor to sensor, putting these two critical sensor goals in conflict.



calibration solution

This conflict can be resolved by individually calibrating each sensor. This has always been a time-consuming and expensive process, however.

The MPS-6's accuracy comes from breakthrough calibration methods that allow sensors to be individually calibrated using an automated calibration apparatus. These new techniques make the MPS-6 the first low cost matrix potential sensor with research-grade accuracy.

the grape monitor

In 2017, the New South Wales Department of Primary Industries commissioned Edaphic Scientific to install a phyto-monitoring system on various varieties of grapevines.

Known as The Grape Monitor, the phyto-systems are measuring stem growth (dendrometers), sap flow, soil moisture, canopy temperature, and more parameters.

Data is uploaded to the internet via the Edaphic Scientific telemetry system. These data can be viewed at anytime.

For more information, [visit The Grape Monitor](#).

whole system monitoring solutions



Edaphic Scientific is a one-stop shop for a whole system monitoring solution. We provide plant and soil monitoring systems for researchers and growers.

Our systems not only support dendrometers, but related sensors such as sap flow, soil moisture, weather parameters, and more.

At Edaphic Scientific we want to work with you from the start of your project through to its completion. We can provide:

- Assistance with project and experimental design
- Procurement of all monitoring equipment, including sensors, data loggers and data management software. Edaphic Scientific is a one-stop shop where we can source and find any necessary equipment for your project from our preferred suppliers or third party suppliers
- Installation and training
- On-going assistance with data interpretation and equipment maintenance
- Data correction and analysis, including statistical analysis with the R-package
- Report and publication preparation including tables, figures, graphs, and

manuscript writing

advanced data collection and management solutions



Edaphic Scientific recognises the need for flexible and adaptable sensor and [data logging solutions](#) for experimental or environmental monitoring projects.

Data can be downloaded directly in the field from data loggers. A direct connection between the data loggers and your computer, via a USB cable, can be used for manual downloading of data.

Alternatively, data can be [downloaded over the internet](#) on your iPhone, iPad or desktop computer with the Eagle.io cloud-based, data management software solutions. Through this remote based downloading capabilities, you can download, view and manage your data, and system, anywhere in the world and at anytime.

specifications

feature	specification
Measurement Principle	Frequency domain with calibrated ceramic discs, thermistor
Measurement Range	Soil Water Potential: -9 to -100,000 kPa Soil Temperature: -40° to 60°C
Resolution	Soil Water Potential: 0.1 kPa Soil Temperature: 0.1°C



feature	specification
Accuracy	Soil Water Potential: $\pm(10\% + 2 \text{ kPa})$ from -9 to -100 kPa (see manual for additional accuracy specifications past -100 kPa) Soil Temperature: $\pm 1^\circ\text{C}$
Power Requirements	3.6 - 15 VDC, 0.03 mA quiescent, 10 mA max during 150 ms measurement
Output	SDI-12
Cable Length	5 m (standard) 75 m (maximum)
Sensor Dimensions	9.6 cm (l) x 3.5 cm (w) x 1.5 cm (d)

manual & docs

- [MPS-6 Soil Water Potential Manual](#)
- [How the MPS-6 sensor has made the tensiometer and gypsum block obsolete](#)

related products

- [Data loggers & monitoring systems](#)
- [ProCheck portable handheld meter](#)
- [Soil moisture sensors, probes and meters](#)
- [Soil water potential sensors](#)
- [Plant water potential pressure chambers](#)
- [Sap flow sensors](#)
- [Weather stations](#)