Document Title: Description, AN, MPS-1 FAQ		Part # and Rev. 13495-01	
		Release Date:	
Rev.	Description	Revision By	Date

Production Filename: 13495 (In Product Library)

Path to Working Files: DecaDoc\Application Notes\Master

Dimensions: 8.5 inch wide, 11 inch tall

Material: Paper, 92 Bright White or better, 75g/m² or heavier

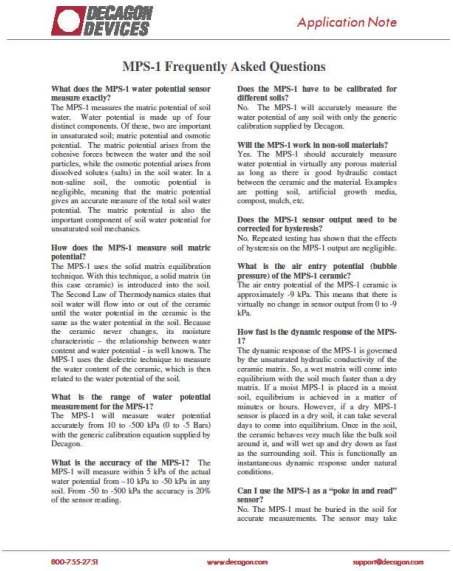
Colors: Color Print on White

Printer: HP Color LaserJet 8550-PS

Finish: None

Adhesive: None

Special Notes: Illustrations are Ref Only ** Not to Scale ** (Shown page 1 of 2)



DECAGON DEVICES Application Note

MPS-1 Frequently Asked Questions

What does the MPS-1 water potential sensor measure exactly?
The MPS-1 measures the matric potential of soil water. Water potential is made up of four distinct components. Of these, two are important in unsaturated soil; matric potential and osmotic potential. The matric potential arises from the cohesive forces between the water and the soil particles, while the osmotic potential arises from dissolved solutes (salts) in the soil water. In a non-saline soil, the osmotic potential is negligible, meaning that the matric potential gives an accurate measure of the total soil water potential. The matric potential is also the important component of soil water potential for unsaturated soil mechanics.

How does the MPS-1 measure soil matric potential?
The MPS-1 uses the solid matrix equilibration technique. With this technique, a solid matrix (in this case ceramic) is introduced into the soil. The Second Law of Thermodynamics states that soil water will flow into or out of the ceramic until the water potential in the ceramic is the same as the water potential in the soil. Because the ceramic never changes, its moisture characteristic – the relationship between water content and water potential - is well known. The MPS-1 uses the dielectric technique to measure the water content of the ceramic, which is then related to the water potential of the soil.

What is the range of water potential measurement for the MPS-1?
The MPS-1 will measure water potential accurately from 10 to -500 kPa (0 to -5 Bars) with the generic calibration equation supplied by Decagon.

What is the accuracy of the MPS-1? The MPS-1 will measure within 5 kPa of the actual water potential from –10 kPa to -50 kPa in any soil. From -50 to -500 kPa the accuracy is 20% of the sensor reading.

Does the MPS-1 have to be calibrated for different soils?
No. The MPS-1 will accurately measure the water potential of any soil with only the generic calibration supplied by Decagon.

Will the MPS-1 work in non-soil materials?
Yes. The MPS-1 should accurately measure water potential in virtually any porous material as long as there is good hydraulic contact between the ceramic and the material. Examples are potting soil, artificial growth media, compost, mulch, etc.

Does the MPS-1 sensor output need to be corrected for hysteresis?
No. Repeated testing has shown that the effects of hysteresis on the MPS-1 output are negligible.

What is the air entry potential (bubble pressure) of the MPS-1 ceramic?
The air entry potential of the MPS-1 ceramic is approximately -9 kPa. This means that there is virtually no change in sensor output from 0 to -9 kPa.

How fast is the dynamic response of the MPS-1?
The dynamic response of the MPS-1 is governed by the unsaturated hydraulic conductivity of the ceramic matrix. So, a wet matrix will come into equilibrium with the soil much faster than a dry matrix. If a moist MPS-1 is placed in a moist soil, equilibrium is achieved in a matter of minutes or hours. However, if a dry MPS-1 sensor is placed in a dry soil, it can take several days to come into equilibrium. Once in the soil, the ceramic behaves very much like the bulk soil around it, and will wet up and dry down as fast as the surrounding soil. This is functionally an instantaneous dynamic response under natural conditions.

Can I use the MPS-1 as a "poke in and read" sensor?
No. The MPS-1 must be buried in the soil for accurate measurements. The sensor may take