



# 'Pocket' Soil Moisture Meter

PAL-Soil

Cat. No. 4571

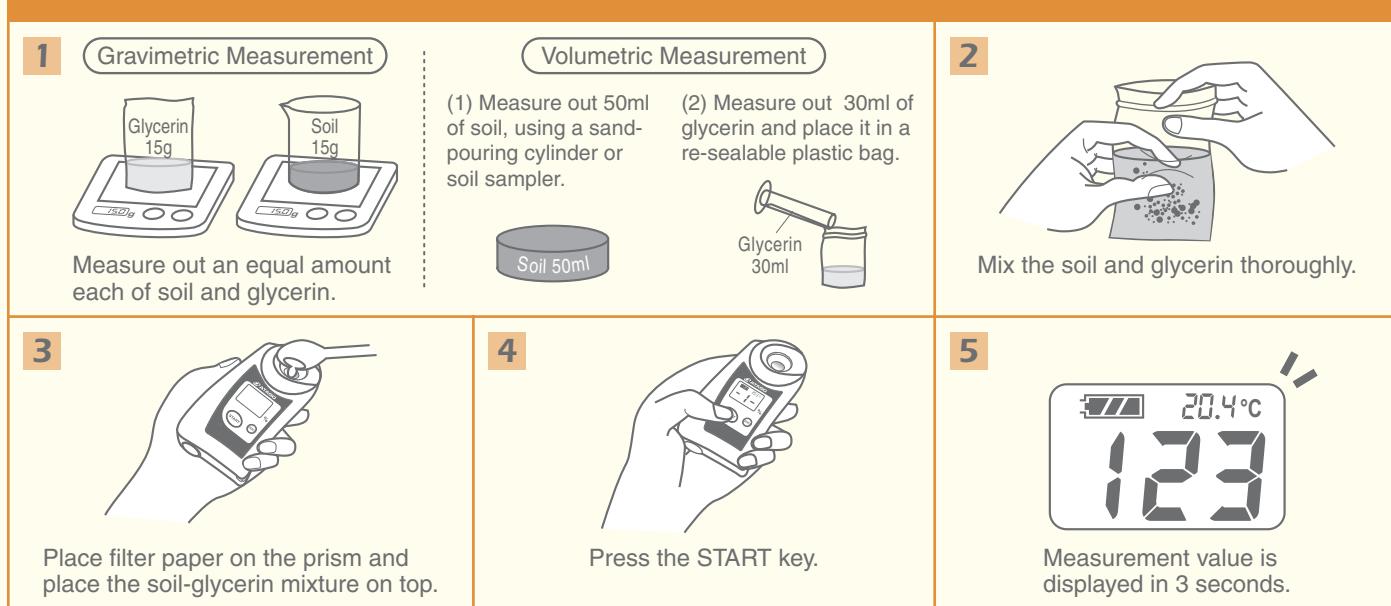
Measurement method in accordance with ISO 16586:2003 "Soil quality – Determination of soil water content as a volume fraction on the basis of known dry bulk density – Gravimetric."



## Save on time, labor, and material with PAL-Soil.

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## Commentary

### What is gravimetric soil moisture?

As defined by ISO 16586:2003, soil quality is the water content % of soil expressed by mass (weight). It is the mass of water relative to the mass of oven-dried soil. Soil is dried in an  $110^{\circ}\text{C} \pm 5^{\circ}\text{C}$  oven.

\*This measurement method was developed by Professor Wada at Kyushu University and has proven to have a strong correlation with ISO 16586:2003.

$$w = \frac{Ma-Mb}{Mb} \times 100$$

•  $w$  = Gravimetric soil moisture (%)      •  $Mb$  = Mass of soil after drying in the oven  
 •  $Ma$  = Mass of soil before drying in the oven      •  $Ma-Mb$  = Mass of water in soil

### What is volumetric soil moisture?

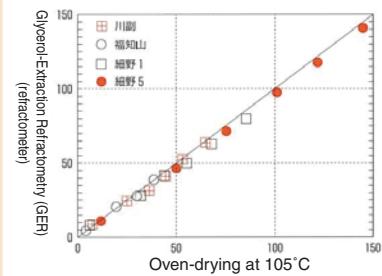
It is the water content % of soil expressed by volume. It is the volume of water relative to the total volume of a soil sample. A sand-pouring cylinder is commonly used.

The PAL-Soil calculates the water content of soil by measuring a decline in the refractive index of glycerin after it is mixed with water at the 5:3 ratios. It utilizes the water-absorbing properties of glycerin.

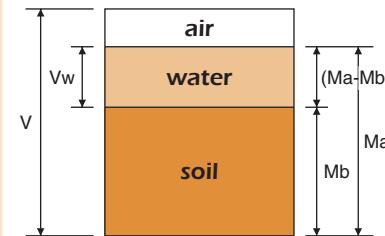
$$\theta = \frac{Vw}{V} \times 100$$

•  $\theta$  = Volumetric soil moisture (%)      •  $V$  = Total volume of soil sample  
 •  $Vw$  = Volume of water

Comparison between refractometers and oven-dry method for determination of gravimetric water content (%) of soil



### Soil Moisture



## Specifications

Measurement range	<ul style="list-style-type: none"> <li>Gravimetric soil moisture: 0 to 200% (Automatic Temperature Compensation)</li> <li>Volumetric soil moisture: 0 to 100%</li> <li>Temperature: 10.0 to 40.0°C</li> </ul>		
Resolution	<ul style="list-style-type: none"> <li>Gravimetric soil moisture: 1%</li> <li>Volumetric soil moisture: 1%</li> <li>Temperature: 0.1°C</li> </ul>		
Measurement accuracy	<ul style="list-style-type: none"> <li>Gravimetric soil moisture: <math>\pm 2\%</math> (0 to 40%), <math>\pm 5\%</math> (41 to 100%)</li> <li>Volumetric soil moisture (Repeatability): <math>\pm 1\%</math> (0 to 60%), <math>\pm 2\%</math> (61 to 100%)</li> <li>Temperature: <math>\pm 1^{\circ}\text{C}</math></li> </ul>		
Measurement temperature	10 to 40°C	Power supply	AAA alkaline battery × 2
Ambient temperature	10 to 40°C	Battery life	About 11,000 measurements (when an alkaline battery is used)
Option	Pocketable Scale		<ul style="list-style-type: none"> <li>AAA alkaline batteries</li> <li>Filter paper</li> <li>Re-sealable plastic storage bags</li> <li>Beaker</li> <li>Plastic tweezers</li> <li>Plastic spoon</li> </ul>
International Protection class	IP65 Water Resistant	Accessories	
Dimensions and weight	55(W) × 31(D) × 109(H)mm 100g		



Always clean and shiny -  
can be cleaned under  
running water.

\*Purchase a premium quality glycerin reagent from a local pharmacy or reagent store.

All ATAGO refractometers are designed and manufactured in Japan

HACCP GMP GLP ATAGO products comply with HACCP, GMP and GLP standards

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