



ThetaKit type TK3

The ThetaKit provides precision soil moisture data. It is easy to use, dependable, affordable - and ideal for use on golf courses

- ❑ **Spot check soil moisture content quickly and easily**
- ❑ **Check the performance of automatic sprinklers**
- ❑ **After saturation, determine the holding capacity of fairways, greens and tees, to optimise moisture level for best play and appearance**

Achieving the highest standards of turf management requires the very best equipment available. Designed originally for scientific applications, the ThetaKit gives greenkeepers access to research quality equipment - but with the complexity removed. You simply push the probe into the soil, press a button and read off the moisture content from the LCD.



Features

- Waterproof and rugged
- Stable performance - even in saline soils
- Minimal disturbance to soil
- Readout unit stores up to 2100 readings
- Readings can hold identification numbers for plot and sample

Irrigation monitoring

Irrigation systems, whether manual or automatic, can have problems with uneven water distribution. This can be caused by damage to sprinkler heads, poor positioning, wind effects or changes in water pressure. Dry spots or over-watered areas often develop unnoticed, but regular monitoring of soil moisture content can give the turf manager early warning and the opportunity to take preventative action.



ThetaKit

This portable kit contains everything you need to make rapid spot readings of soil moisture content:

- ❑ **ThetaProbe type ML2x/d** - with 2m cable length
- ❑ **Spare ThetaProbe rods** - pack of 4
- ❑ **Moisture Meter type HH2** - with spare battery
- ❑ **Insertion Kit type ML-INK1** - for use in hard soils
- ❑ **Carrying Case type HHCC1** - to hold all items in kit

ThetaProbe type ML2x

Simple to use The ThetaKit is a portable, reliable, accurate soil moisture measurement system for instantaneous readout of soil moisture. Simply insert the ML2x ThetaProbe into the soil, connect to your HH2 Moisture meter and within seconds you can be measuring soil moisture. Thousands of ThetaProbes are in use all over the world, in a wide range of applications.

The narrow rods with sharp tips minimize errors due to soil compaction. They are highly resistant to corrosion, can withstand repeated insertion in soil - and can be replaced at low cost if bent or damaged.

NB This leaflet only covers the use of the ThetaProbe as part of a ThetaKit. However, the ThetaProbe can also be used with extension tubes for deeper measurements, or buried at depths of up to 5m. It can also be connected to a data logger. Please request our Soil and Plant Water Measurement catalogue for further details, or visit www.delta-t.co.uk.

Calibration For convenience, many users simply apply one of the two standard calibrations supplied by Delta-T. With these "generalised" mineral or organic calibrations, 5% accuracy can be achieved. Alternatively, after a single two-point gravimetric calibration, ThetaProbes will meet their full 1% accuracy specification for your specific soil.

ThetaProbe Specification

Accuracy & range	Calibration	Response & stabilisation	Environmental	Input & output	Dimensions, sampling volume & cabling
± 0.01 m ³ .m ⁻³ ± 0.02 m ³ .m ⁻³	(1%): 0 to 40°C (2%): 40 to 70°C	After calibration to a specific soil type.	Response: <0.5 secs to 99% of change.	Requires 5 to 15V DC at 20mA (typical). Minimum >5.5V with 100m cable	Rods 60mm x 3mm diameter. Overall length 207mm, diameter 40mm.
± 0.05 m ³ .m ⁻³	(5%): 0 to 70°C	Using "generalised" soil calibrations supplied.	1 sec warm-up is advised.	Voltage output 0 to -1V DC for 0 to 0.6 m ³ .m ⁻³ , almost linear. Compatible with most data loggers.	Sampling volume: approx 60mm x 30mm diameter. 2m cable in ThetaKit
Accuracy figures apply over the range 0.05 to 0.6 m ³ .m ⁻³ . Full reading range is 0 to 1 m ³ .m ⁻³ .					
Salinity errors from 0.0 to 250 mS.m ⁻¹ , <-0.0001 m ³ .m ⁻³ change per mS.m ⁻¹ . Minimal change beyond 250 mS.m ⁻¹ . Can be calibrated up to 2000 mS.m ⁻¹ .					

Moisture Meter type HH2

Simple, versatile operation The ThetaKit includes the HH2 Moisture Meter which offers impressive functionality in a compact, hand-held unit, designed for field use. Readings are displayed on the LCD and can be stored to memory for later download to a PC. Up to 2100 time-stamped readings can be stored.

The unit can be operated with one hand, for convenience in the field.

Data is transferred to a PC using the RS-232 cable provided with each unit. The HH2Read Windows PC software provides a data import wizard for direct download into Excel or other PC spreadsheet packages, or into irrigation scheduling programs. Data can also be downloaded in comma-separated ASCII data file (.CSV) format.

Moisture Meter Specification

Soil moisture range	Zero to saturation. 0 – 1.5V on voltage range
Accuracy/Resolution	± (0.13% of mV reading ±1.0 mV). 1 mV resolution
Connection	1 x male 25-pin connector, used for RS232 communications and sensor connection
Sealing/environment	IP54 (Splashproof). Operating temp range 0°C - 40°C
Shock	Maintains functional specification after 1m drop onto concrete
EMC testing	Fully complies with European EMC regs. Tested to comply with EN 61326 class B
Size/weight	150 x 80 x 40mm, 450g
Battery life	Typically 6500 readings (9V PP3 alkaline cell)
Memory Capacity	Minimum 227 Typical 2186
Output	Soil Moisture content (m ³ .m ⁻³ or % Vol), or water deficit (mm), or unconverted mV output
Carrying Case type HHCC1	Case dimensions: 340(w) x 85(d) x 280(h) mm (height includes handle).

Ordering Information

TK3-Basic: ThetaKit v3 - portable soil moisture measuring kit. Includes ThetaProbe ML2x/d-02 (2m cable), pack of 4 x spare stainless steel rods, Moisture Meter HH2, Insertion Kit ML-INK1, User manuals and carry case.



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