SOIL > PHYSICAL PROPERTIES

PORTABLE THERMAL CONDUCTIVITY & RESISTIVITY TESTER

Code : T148

- The Portable Meter is designed to determine thermal conductivity and thermal resistivity of soils and other soft materials using the thermal needle probe (transient line source) principle, supporting both laboratory investigations and in-situ field checks where heat transfer behavior is critical.
- The method is based on inserting a needle probe into the material, applying a controlled heat input for a defined test period, and evaluating the recorded temperature rise versus time to calculate the thermal property in accordance with the thermal needle probe procedure.
- Typical applications include geotechnical design, earthworks quality control, geothermal and ground-coupled heat transfer studies, and research programs where thermal performance of soils, pastes, powders, and similar media must be quantified with repeatable methodology.
- When used with the appropriate probe configuration, the system also supports soil thermal resistivity measurement aligned with the industry guide commonly used for underground cable backfills and thermal rating evaluations.

- The controller is built for practical workflow and traceability: tests are stored internally, results can be reviewed on the device, and datasets can be exported in CSV format via USB for reporting and archiving.
- Optional probe capability extends thermal characterization beyond conductivity/resistivity to include thermal diffusivity and volumetric specific heat capacity, enabling broader thermal modelling where multiple material properties are required.

STANDARDS

ASTM D5334

TECHNICAL SPECIFICATIONS

- Measurement principle: Transient Line Source (Thermal Needle Probe)
- Measured properties: Thermal Conductivity, Thermal Resistivity
- Optional measured properties (vCp configuration): Thermal Diffusivity, Volumetric Specific Heat Capacity
- Thermal conductivity range (probe dependent): 0.1 to 5.0 W/m·K
- Thermal resistivity range (probe dependent): 0.2 to 10 m·K/W
- Temperature range (probe dependent): -40 to 100°C
- Controller accuracy (typical): Better than 5%
- Controller repeatability (typical): Better than 2%
- Temperature resolution: 0.001°C
- Voltage measurement capability: Better than 0.01 V
- Time resolution: 1 ms
- Data format: CSV
- Internal storage (typical): 1000 measurements
- Interface: USB
- Display: 320 × 240 TFT color display
- Power: 4 × AA batteries or USB power

- Optional (vCp configuration) performance:
  - Thermal conductivity range: 0.02 to 5.0 W/m·K
  - Thermal diffusivity range: 0.1 to 1.5 mm^2/s
  - Thermal diffusivity accuracy (typical): 10%
  - Volumetric specific heat capacity (typical): Up to 3.5 $MJ/m^3 \cdot K$
  - Volumetric specific heat accuracy (typical): 15%

SET

- Controller unit
- Needle probe (standard configuration, as ordered)
- Thermal paste
- USB cable
- USB flash drive with data utility software
- Carrying case
- Batteries

ORDERING INFORMATION

Item Name	Item Code
PROBE for SOIL	T148P001H
PROBE for CONCRETE and ROCK	T148P002H
PORTABLE THERMAL CONDUCTIVITY & RESISTIVITY TESTER	T148X001B

OTHER PHOTOS