



TCR24

Integrated battery

Integrated monitor

Touch screen display

Measure of soil thermal conductivity

TCR24 is designed to measure soil heat transmission (soil tendency to transmit heat). This type of survey is usually carried out prior to install underground pipes, or prior to build geo-thermic wells to detect heat from the soil, for buildings heating or conditioning. Measurement can be done on site with the probe supplied, up to a depth of 120 cm, or in case of greater depths, it is possible to pick up samples of compact ground (logs) and perform measurement in laboratory with proper laboratory probe. Acquired data can be examined directly on site, at the end of the acquisition phase regulated automatically by the device and it is expressed graphically and numerically in watt / (metres x kelvin) where: watt = unit of power; metre = unit of distance; kelvin = unit of temperature. Operatively speaking, a hole is made into the ground using common drill (not supplied) and a perforation point of 20 mm diameter with prolonged rod (supplied). Then the probe is introduced into the hole and by pressing slightly, probe tip is fixed into the ground at about 20 cm, in order to obtain best coupling with soil. Data acquisition is initiated by pressing a button, it is managed automatically by the instrument and lasts few seconds. Numeric and graphic data is stored on SD memory and then elaborated with dedicated TCReader software supplied together with instrument.

Heat transmission of some types of soils

- Dry loose rocks: +/- 1.5 W/m K
- Gravel, sand, water table: 1.8 2.4W/m K
- Granite: 3.4W/m K

Methodologies

Ground thermal conductivity

General

CPU	ARM Cortex A9
Power supply	Li-ion 10,8V/12,4Ah
Autonomy	> 8 hours
Acquisition medium power consumption	350mA

General

CPU environmental conditions	Temperature (°C):-20 a 70; Humidity (RH): 0-90%
Monitor	TFT-LCD capacitive 7" touch-screen, 1280x800
Connections	USB
Data storage	Internal memory 5 GB (up to 300.000 acquisitions) / external USB
Case	Polypropilene, automatic pressure valve, IP67
Dimensions	cm 27 x 24,8 x 12,3
Weight	3 kg
Reference regulations	IEEE-442-2017 ; ASTM D5334-14

Acquisition

Type of measure	Resistivity and thermal conductivity
Number of channels	1
ADC converter resolution	24 bit
Measurement range Thermal conductivity	from 0,1 to 6 W/m*K
Measurement range Thermal resistivity	from 0,17 to 10 m*K/W
Accuracy	+/- 6%
Measure interval	300s - 900 s
Temporal measure resolution	25 ms
Standard probe total length (CTS120)	120 cm
Needle length (CTS120)	17 cm
Probe diameter	6,3 mm
Probe environmental conditions	0°C / 50°C



