

MultiDisk

Automated minidisk tension infiltrometer

Specifications

This instrument was developed in the framework of the project funded by Technology Agency of the Czech Republic

Type of apparatus: automated tension minidisk infitrometer for measuring unsaturated hydraulic conductivity of soils

Outside dimensions complete MultiDisk (w x l x h):..... 66 x 46 x 35 cm
Outside dimensions of free Infiltration modules held in a T frame (w x l x h):
..... 43 x 40 x 33 (41⁽¹⁾) cm
Weight (without water):..... 13.5 kg
Weight (including water):..... 15 kg
Data logger: CR1000 (Campbell Scientific, Inc.)
Battery:..... NiMH 12 V 1500 mAh
Charger: Ni-MH specific wall charger
Typical maximum time of operation per charge:..... 36 hours⁽²⁾
Control:..... a) via CR1000KD keyboard (Campbell Scientific, Inc.)
..... b) via laptop PC
No. of aluminum T-shaped frames: 2
No. of infiltration modules:3 per frame (6 in total)
Number of Mariotte's bottles:1 per frame (2 in total)
Range of pressure heads (h_0):0.5 to 60 mm tension head

Infiltration module specifications

Height: 33.0 cm
Height usable for water storage: 16.0 cm
Reservoir diameter:.....5.0 cm
Vertical bar measuring buoyancy force:2.5 cm dia., 22.5 cm length
Sintered stainless steel disk:4.45 cm dia., 0.3 cm thickness
Usable reservoir volume: 148 ml
Total max. volume of water in reservoir:..... 190 ml
Sensor type:..... console load cell with bridge sensor
Maximum sensor load:..... 300 g

Load sensor properties:

- nonlinearity, hysteresis : $\pm 0.184 \text{ mm } (z_w) \text{ or } \pm 0.162 \text{ ml } (V_w)$
- temperature effect
 - a) +20 to +40°C = $\pm 0.107 \text{ mm} / 10 \text{ K } (z_w)$
= $\pm 0.095 \text{ ml} / 10 \text{ K } (V_w)$
 - b) -10 to +20°C = $\pm 0.072 \text{ mm} / 10 \text{ K } (z_w)$
= $\pm 0.063 \text{ mm} / 10 \text{ K } (V_w)$

Mariotte's bottle

Total height: 19.5 cm

Diameter:.....5.0 cm

Length of suction adjustment tube:..... 15.0 cm

Volume of water:..... 160 ml

⁽¹⁾ vheight at maximum extension of infiltration modules and adjusting legs

⁽²⁾ depending upon measuring regime

z_w – actual water level height in the resevoir of the infiltration module

V_w – actual water volume in the reservoir of infiltration module