RTM 2200 Soil Gas

Radon/Thoron Monitor

Applications:

- for measurements of the activity concentrations of airborne **radon (^{222} Rn) and thoron (^{220} Rn)** in water, air, exhalation, emanation, building materials, etc.
- for geological investigations, volcanism and earthquake research
- for soil air measurements regarding the radon risk in building projects

Features:

- determination of the radon and thoron concentration **with integrated simultaneous soil permeability measurement** with water ingress protection
- fastest possible response and decay times of the Radon signal
- no falsification of measured values by thoron (^{220} Rn) - this is measured separately - thanks to real spectroscopy
- no long-term contamination by ^{210} Po even with constant measurement of high radon soil air concentrations
- handy, robust case with a high degree of protection (at least IP54)
- warning lamp signals the end of a soil air measurement or insufficient soil permeability
- GPS receiver enables later display on a map (GoogleTM)
- optional TDR probe for simultaneous measurement of soil moisture as another important parameter for evaluating the radon potential
- optional sensors for CO2 (0-10%) and/or CH4 (0-5%) in the air circuit
- DAkkS-accredited calibration according to DIN EN ISO/IEC 17025:2018

Radon measurement	
Detector type	4 x 200 mm² Si-detector with HV-chambers
Internal volume	300 mm³ (total volume of the internal air loop including water ingress protection)
Range	1 … 10 000 000 Bq/m³
Sensitivity	3 / 6.5 cpm/(kBq/m³) for fast / slow mode
Accuracy	<=5%
Response time	12 / 120 min for fast / slow mode
Measurement/Analysis	alpha spectroscopy with separate calculation of radon and thoron concentration storage of the alpha spectrum for each data record
Pump	high quality membrane pump flow rate 0.4 or 1.2 l/min controlled by processor
Fresh air flushing	automatic switch over between fresh air and sample air inlet
Soil permeability	
Measuring principle	measurement of the pressure difference at regulated flow rates (0.4 or 1.2 l/min)
Range	$8 * 10^{-12}$ m² … $8 * 10^{-14}$ m²
Sampling	tube connection to soil gas probe
Control function	
Battery voltage	measurement will be stopped in case of discharged battery; hardware protection against deep discharge
Flow rate	alert signal if flow rate cannot be maintained by the regulator (e.g. permeability too low)
Current consumption pump	measurement will be stopped in case of damaged or worn pump
Water ingress protection	pump will be stopped as soon as water is sucked stainless steel can may be removed to drain the water
Internal sensors	
Rel. Humidity	0 …100%, accuracy ± 2%
Temperature	-20 … 40 °C, accuracy ± 0.5°C
Bar. Pressure	800 … 1200 mbar, accuracy 0.5% MW
Flow	0 … 2 l/min, accuracy ± 5% @ 1 l/min humidity/temp. sensors integrated in the internal air loop

General	
GPS receiver	high accuracy by simultaneous reception of GPS, Galileo and GLONASS
Measuring cycles	continuous sampling (1, 5, 15, 30 and 60 minutes) cycle for soil gas measurement (20 minutes) additional cycles may be programmed by the user
Data storage	SD Card, 2 GB (>1 Mio. data records)
Operation/ Display	touchscreen 6 x 9cm, visible in direct sunlight
Interfaces	USB, RS232
Power supply	internal 12V NiMH rechargeable battery (>100 h), AC/DC mains adapter 100-240V ~50/60Hz, 1,8A
ATEX category	no
Environmental conditions	0 ... 40°C 0 ... 95% rH, non-condensing 800...1100mbar
Dimensions	235mm x 140mm x 255mm
Weight	6 kg (excl. accessories)
Measuring case	with bulkhead fittings and signal light (W x D x H, mm: 417 x 221 x 334, weight 2,9kg)
Software	dVISION/dCONFIG
Acessories	
Scope of delivery	USB- & RS232-cable, dust filter (x2), fuse (x2), PVC tubes 10x6mm (1,5 m), 6x4mm (1,5 m), incl. transition pieces, water intake protection (x1), charger/power supply adapter (x1), case for field applications, user manual & software (on CD), DAkkS-accredited calibration certificate
Optional	on request / soil gas probes, AquaKit, exhalation bonnet, emanation barrel, packer probe, and other

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