

EQF 3220

Radon/Thoron Gas & progeny product monitor



Applications:

- for simultaneous measurements of airborne **radon (^{222}Rn) and thoron (^{220}Rn)** activity concentrations and airborne radon decay products (**EEC**) activity concentrations and/or potential alpha energy concentration (**PAEC**) with determination of equilibrium factors
- in mining and for geological investigations
- public radiological safety measurements and environmental monitoring
- radiological surveillance of places with sources of ionizing radiation

Features:

- determination of the activity concentrations of radon and thoron as well as concentrations of the radon/thoron progenies depending on the particle size of the carrier aerosol
- in addition to the free (< 5 nm) and attached (> 100 nm) part, the cluster component is also measured in the range of approx. 20...100 nm
- the small **aerosol measuring head can be removed** from the device and positioned anywhere in the room if required
- processor-controlled rotary vane pump
- outstanding sensitivity, full spectroscopy, therefore long-term contamination by ^{210}Pb is excluded
- stores the complete alpha spectrum for each measured value
- DAkkS-accredited calibration according to DIN EN ISO/IEC 17025:2018

Radon measurement

Detector type	4 x 200mm ² Si-detector with HV-chambers
Internal volume	250mm ³ (total volume of the internal air loop)
Range	1 ... 10 000 000 Bq/m ³
Accuracy	<=5%
Sensitivity	3 / 6.5 cpm/(kBq/m ³) for fast / slow mode
Response time	15 / 120 min for fast / slow mode
Results/ Analysis	radon concentration fast (excl. ²¹⁴ Po) and slow (incl. ²¹⁴ Po) thoron concentration storage of record related spectra and time distribution

RD sampling head

Dimensions	<i>Removable telescopic attachment on the device</i> diameter 44 mm, length 100 mm
Detectors	2 x 150 mm ² ion-implanted silicon detector
Filter	membrane filter, d=27mm, 1µm pore size
Screen	stainless steel grille, d = 15 mm
Pumpe	rotary vane type 1.65 l/min, processor controlled
Range	each 1 ... 1 000 000 Bq/m ³ (EEC) free/attached
Sensitivity	attached decay products approx. 600 cpm/(kBq/m ³) (EEC) free decay products approx. 150 cpm/(kBq/m ³)
Response time	120 min
Results/Analysis	EEC, PAEC each for free and attached radon and thoron decay products, storage of spectra and time distribution

Gamma probe (option)

Detector type	<i>Connected to the front panel of the EQF 3220 by cable</i> Sodium-Iodid (NaJ(Tl)) with integrated PMT and Bias Scintillation crystal 2" x 2"
Energy range	25 keV – 3 MeV
Resolution	<7.5% (Cs-137)
Results / Analysis	dose power, Net-activity of seven user defined nuclides Storage of record related spectra and time distribution
Probe dimensions	diameter 60mm, length 260mm cable 5m (optional 10m)

Additional sensors

Standard	rel. Humidity 0 ... 100%, uncertainty $\pm 2\%$ temperature -20 ... 40°C, uncertainty $\pm 0.5^\circ\text{C}$ bar. pressure 800 ... 1200mbar, uncertainty 0.5% value flow rate 0 ... 4 l/min, uncertainty $\pm 5\%$ humidity / temperature sensors in air circuit
Air analytics (option)	CO, CO ₂ , CH ₄ , combustible gases, several ranges
Water analytics (option)	pH-value, Redox potential, conductivity etc.
Process (option)	pressure, differential pressure, flow, velocity etc.
Meteorological (option)	wind direction, wind speed etc.

General

Sampling	simultaneous measurement with all detectors/sensors with respect to the selected sampling cycle
Sampling cycles	storage of up to 16 different sampling cycles with up to 32 steps (pre-defined or infinite repetition) Interval 1 Second to several weeks
Data storage	SD Card, 2 GByte
Operation / display	touchscreen, 6 x 9 cm
Interfaces	USB, RS232, optional LTE-modem and other
Power supply	12 V NiMH-rec. battery (>100 h continuously) mains adapter 100-240V ~50/60Hz, 1,8A
ATEX category	no
Dimensions / weight	235 mm x 140 mm x 255 mm / 6 kg
Software	dVISION: control and data transfer, visualization, data management dCONFIG: system configuration, creating / changing cycles (also via Net Monitors) dLIBRARY: Nuclid library for NaJ gamma probe (option)
Extensions	available at internal connectors: 8 analogous inputs, 3 counter inputs, 2 status inputs, 6 switch outputs, clock switch, PID regulator/analogous output
GPS (option)	GPS coordinates are recorded and stored together with the measurement results. GIS compatible *.kml files can be exported (can be opened by Google-Earth). antenna connected by cable
Environmental conditions	0...40 °C 0...95 % rH, non-condensing 800...1100 mbar

Accessories

Scope of delivery

charging adapter
USB cable, RS-232 cable
dust filter (2 pcs.)
aerosol filter (1+10 pcs.)
PVC-tube (2 m)
fuse (2 pcs.)
transport case
manual & Software (elektronical version)
DAkkS-accredited calibration certificate according DIN
EN ISO/IEC 17025:2018

Optional

soil gas kits (pile drive probe or packer probe)
exhalation bonnet
AquaKit for measurements of Radon in water
and many more.