EQF 3300

Radon/Thoron Gas & progeny 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 factor
- use at workplaces, in mining and for geophysical investigations for measurements in the air, in soil gas, in water samples, etc.
- 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 the radon/thoron decay products and determination of the equilibrium factor
- processor-controlled rotary vane pump
- outstanding sensitivity and perfect separation of the individual radon decay products using alpha spectroscopy, therefore long-term contamination by ^{210} Pb is excluded
- no desiccant cartridge required
- stores the complete alpha spectrum for each measured value
- optional gamma probe (NaJ detector) (MCA 1024 channels)
- numerous customer-specific additional sensors possible
- optional GPS module, optional water ingress protection
- DAkkS-accredited calibration for Radon gas according to DIN EN ISO/IEC 17025:2018, factory calibration for Radon progeny

Radon measurement	
Detector type	4 x 200mm² Si detector with HV-chambers
Internal volume	250 ml (total volume of the internal air loop)
Range	1 … 10 000 000 Bq/m³
Accuracy	<= 5%
Sensitivity	3 / 6.5 cpm/(kBq/m³) for fast / slow mode
Response time	15 / 120 min for fast / slow mode
Results/ Analysis	radon concentration fast (excl. Po-214) and slow (incl. Po-214) thoron concentration storage of record related spectra and time distribution
RD sampling head	*External RP-head*
Detector type	400mm² ion-implanted silicon detector
Filter	membrane filter, d=27mm, 1µm pore size active filter monitoring against perforation, exhaustion no tool for filter replacement required
Pump	rotary vane type 1.65 l/min, processor controlled
Range	1 … 1 000 000 Bq/m³ (EEC)
Sensitivity	approx. 600 cpm/(kBq/m³) (EEC)
Response time	120 min
Results / Analysis	determination EEC, PAEC for both, Radon und Thoron storage of record related spectra and time distribution
Gamma probe (option)	*Connected to the front panel of the EQF 3300 by cable*
Detector type	Sodium-Iodid (NaJ(Tl)) with integrated PMT and Bias Scintillation crystal 2“ x 2“
MCA	1024 channels
Energy range	25keV – 3MeV
Resolution	<7.5% (Cs-137)
Results / Analysis	dose rate, 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)

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Additional sensors	
Standard	rel. Humidity 0 …100%, uncertainty ± 2% temperature -20 … 40°C, uncertainty ± 0.5°C bar. pressure 800 … 1200mbar, uncertainty 0.5% MW flow rate 0 … 4 l/min, uncertainty ± 5%
Air analytics (option)	CO, CO2, CH4, 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) Integration interval from 1 second to several weeks
Warning thresholds	Up to 30 warning thresholds for several parameter possible
Data storage	SD Card, 2 GByte
Display	Coloured touchscreen, 6 x 9 cm
Interfaces	USB, RS232, 2x analog outputs (4-20mA), 2x RS485 (one with ModBusRTU), 2x AUX (one used for RP-head), optional WI-FI. Two interfaces are working at the same time (see manual)
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 (via Wi-Fi), visualization, data management dCONFIG: system configuration, creating / changing cycles (also via Wi-Fi) 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	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 fixed on the front panel
Environmental conditions	0…40 °C 0…95 % rH, non- condensing 800…1100 mbar

Accessories

Scope of delivery	USB-cable Dust filter (x2) Aerosol filter (1+10 pcs.) Fuse (x2) PVC tube 6x4mm (1,5 m) Charger/power supply adapter (x1) Transportation case User manual & software (electronical version) DAkkS-accredited calibration certificate for Radon, factory calibration certificate for Radon progeny
Optional	Measuring case PVC tubes 10x6mm (1,5 m) for measuring case Soil gas kit simple Packer probe for Rn in soil gas measurements Exhalation bonnet Emanation barrel AquaKit with IR-thermometer for measurements of Radon in water Tripod for Radon progeny measuring head (up to 180 cm, adjustable) Water intake protection and much more.

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