

# EQF 3220

## Radon/Thoron Gas & progeny product monitor



### Applications:

- for simultaneous measurements of airborne **radon ( $^{222}\text{Rn}$ ) and thoron ( $^{220}\text{Rn}$ )** 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  $^{210}\text{Pb}$  is excluded
- stores the complete alpha spectrum for each measured value
- DAkkS-accredited calibration according to DIN EN ISO/IEC 17025:2018

**Radon measurement**

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

**RD sampling head**
*Removable telescopic attachment on the device*

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

**Gamma probe (option)**
*Connected to the front panel of the EQF 3220 by cable*

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

**Additional sensors**

<b>Standard</b>	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% MW flow rate 0 ... 4 l/min, uncertainty $\pm 5\%$ humidity / temperature sensors in air circuit
<b>Air analytics (option)</b>	CO, CO <sub>2</sub> , CH <sub>4</sub> , combustible gases, several ranges
<b>Water analytics (option)</b>	pH-value, Redox potential, conductivity etc.
<b>Process (option)</b>	pressure, differential pressure, flow, velocity etc.
<b>Meteorological (option)</b>	wind direction, wind speed etc.

**General**

<b>Sampling</b>	simultaneous measurement with all detectors/sensors with respect to the selected sampling cycle
<b>Sampling cycles</b>	storage of up to 16 different sampling cycles with up to 32 steps (pre-defined or infinite repetition) Interval 1 Second to several weeks
<b>Data storage</b>	SD Card, 2 GByte
<b>Operation / display</b>	touchscreen, 6 x 9 cm
<b>Interfaces</b>	USB, RS232, optional LTE-modem and other
<b>Power supply</b>	12 V NiMH-rec. battery (>100 h continuously) mains adapter 100-240V ~50/60Hz, 1,8A
<b>ATEX category</b>	no
<b>Dimensions / weight</b>	235 mm x 140 mm x 255 mm / 6 kg
<b>Software</b>	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)
<b>Extensions</b>	available at internal connectors: 8 analogous inputs, 3 counter inputs, 2 status inputs, 6 switch outputs, clock switch, PID regulator/analogous output
<b>GPS (option)</b>	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
<b>Environmental conditions</b>	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.