



ALPHAGUARD

Your Radon lab everywhere



- All-in-one solution featuring a large digital display
- High sensitivity, strong reliability
- Up-to-date connectivity
- Suitable for any Radon measurement task

ALPHAGUARD



The reference instrument in radon monitoring

The new generation of AlphaGUARD offers **high detection efficiency in radon monitoring**, a wide measurement range (2 – 2 000 000 Bq/m³), **fast response** and permanent, maintenance-free operation with **long-term stable calibration**.

In addition to the radon concentration, AlphaGUARD simultaneously measures and records ambient temperature, relative humidity and atmospheric pressure with embedded sensors.

Optimal ergonomics, high responsiveness and a large digital display make AlphaGUARD a **reference device to perform measurement and analysis everywhere from a lab to the field**.

Applications



Research & Specific applications, calibration labs



Nuclear & NORM industries (mining, nuclear waste, oil & gas industry...).



Monitoring Radon in homes & workplaces

Radon monitoring for all purposes



Soil measurement

Emanations from the underground are measured with the gas soil probe



Water measurement

Radon gas in water is controlled with AquaKIT



Radon progenies

Radon progeny concentration is measured with AlphaPM



Air measurement

Thoron gas discrimination and measurement mode available



Technical features

TYPE OF DETECTOR
Ionization chamber

MEASUREMENT PRINCIPLE
3D Alpha spectroscopy and current mode

MEASUREMENT MODES*
diffusion, flow or sampling

MEASURING RANGE*
From 2 to 2.000.000 Bq/m³
(from 0.027 pCi/l to 54 nCi/l)

ADDITIONAL SENSORS
T, P, H, Reloc, QA, ext. sensors

DISPLAY
Graphic display, backlight

AUTONOMY
> 10 days (diffusion mode)

DIMENSIONS / WEIGHT
360 x 335 x 123 mm, < 7 kg

* According to the product version

Radon monitoring range

Discover other products of Bertin Instruments



Ultra-small continuous radon monitor

Calibration facilities



In combination with the radon chamber, AlphaGUARD allows the measurement of radon in material and the calibration of any other radon instruments



TECHNICAL DATASHEET

AlphaGUARD

/ MULTIPARAMETER FEATURES

Atmospheric air pressure - Type of sensor - Measurement range - Resolution displayed on Screen - Resolution under DataVIEW or DataEXPERT - Initial calibration uncertainty	piezo-resistive semiconductor sensor 700 mbar ... 1100 mbar 0,1 mbar 0,1 mbar +/- 3 mbar	Relocation sensor - Type of sensor - Events detected - Notation for DataEXPERT	Three-axis, capacitive semiconductor sensor Gentle acceleration (low-frequency only) Number of events per cycle (max. 254)
Ambient temperature (sensor in ionization chamber) - Type of sensor - Measurement range - Resolution displayed on Screen - Resolution under DataVIEW or DataEXPERT - Initial calibration uncertainty	Band gab semiconductor sensor - 20 °C ... + 70 °C (- 4 ... + 158 °F) 0,1 °C (0,1 °F) 0,1 °C (0,1 °F) +/- 1,5 °C (+/-2,5 °F)	Mains power monitor - Operating principle - Events detected - Notation for DataEXPERT	Monitors ext. 10 ... 32 VDC supply from mains adapter Loss or restart of mains supply, charging Irrevocable flag set for loss or restart and charging
Relative air humidity (sensor in ionization chamber) - Type of sensor - Measurement range - Resolution displayed on Screen - Resolution under DataVIEW or DataEXPERT - Initial calibration uncertainty	Capacitive semiconductor sensor 0 % rH ... 99 % rH 0,1 % rH 0,1 % rH +/- 3 % rH	External counter signal channel 1 & 2 - Operating principle - Events detected - Measuring range - Notation for DataEXPERT	Pulse counter Counts per minute (cpm) 0 ... 10 kHz Series of statistical values of pulse rate
External sensor channel 1 & 2 - Measurement range - Resolution under DataVIEW or DataEXPERT - Signal sampling rate - Total signal error - Input impedance - Input connector type	0 VDC ... 2,5 VDC 0,00061 VDC 30 per minute +/- 0,01 VDC plus +/- 3 % 10 kOhm HIROSE HR10A-10R-10PB	Gamma dose rate channel (option) - Type of sensor - Measuring range - Initial calibration uncertainty - Resolution displayed on Screen	Geiger-Müller tube 20 nSv/h ... 10 mSv/h +/- 20 rel.-% 1 nSv/h

/ CHARACTERISTICS AND APPLICATION AREAS

	D50	D2000	DF2000
Flow mode (internal pump)	✗	✗	✓
Measuring cycles (Diffusion)	10 min 60 min Overhead cycling	10 min 60 min Overhead cycling	10 min 60 min Overhead cycling
Measuring cycles (Flow)	✗	✗	1 min 10 min 10 min (Rn/Tn mode) Overhead cycling
Radon in air	✓	Diffusion	✓ Diffusion and flow
Radon/Thoron discrimination	✗	✗	✓
Radon in soil gas (Soil gas probe)	✗	✗	✓
Radon in water samples (AquaKIT)	✗	✗	✓
Radon progenies (AlphaPM)	✓	✓	✓
Gamma dose rate (ODL Module)	✓ (with gamma dose rate module)	✓ (with gamma dose rate module)	✓ (with gamma dose rate module)
Multisensor Unit	✓	✓	✓
Calibration measurements	✓	Inside container by diffusion	✓ Inside / outside container by diffusion/flow
Emanation measurements	✓	Inside container box by diffusion	✓ Inside / outside container by diffusion/flow
Exhalation measurements	✓	Inside Radon box by diffusion	✓ Inside / outside Radon box by diffusion/flow

/ TECHNOLOGY

	D 50	D 2000	DF 2000
Type of radon detector	Ionization chamber, HV \approx 750 VDC		
Mode of operation	3D-alpha spectroscopy and current mode		
Total detector volume	0,62 liter (38 cubic inches)		
Active detector volume	0,56 liter (34 cubic inches)		
Type of Radon progeny filter (detector entry window)	Fine dust filter (retention coefficient >99,9 %)		
Detector filling mechanism	Design-optimized for fast passive diffusion		
Transient response function (time delay)	Signal > 30 % after 10 min Signal > 70 % after 20 min Signal > 90 % after 30 min		
Detector signal acquisition	fast digital signal sampling network, using three separate ADC channels		
Spectral signal extraction	DSP (Digital Signal Processing), on-line-cross correlation algorithms		
Detector efficiency	1 CPM at 20 Bq/m ³ (or at 0,55 pCi/l)		
Detector efficiency in Rn/Tn discrimination mode for radon for thoron at 1l/min flow rate for thoron at 2l/min flow rate	-	-	1 CPM at 60 Bq/m ³ (1,6 pCi/l) 1 CPM at 200 Bq/m ³ (5,5 pCi/l) 1 CPM at 140 Bq/m ³ (3,8 pCi/l)
Background signal due to internal detector contamination	< 1 Bq/m ³ (0.03 pCi/l)		
Measurement range Radon (Rn-222)	2 Bq/m ³ ... 50 000 Bq/m ³ (<0.05 pCi/l ... 1 350 pCi/l)	2 Bq/m ³ ... 2 000 000 Bq/m ³ (<0.05 pCi/l ... 54 000 pCi/l)	
Measurement range Thoron (Rn-220)	-	-	2 Bq/m ³ ... 2 000 000 Bq/m ³ (0.05 pCi/l ... 54 000 pCi/l)
Resolution on LCD display	1 Bq/m ³ (0.01 pCi/l)		
Fold back protection	> 10 000 000 Bq/m ³ (> 300 000 pCi/l) verified		
System linearity error	< 3% within total range		
Instrument calibration error (Rn-222)	\pm 3 % (plus uncertainty of the primary standard)		
Flow range of pump	-	-	Flow-regulated: 0,05 - 0,5 l/min, 1 l/min, 2 l/min
Data capacity (non-volatile)	Up to 60 000 measurement points ~ 400 days at 10 min measuring cycle ~ 2 500 days at 60 min measuring cycle		Up to 60 000 measurement points ~ 40 days at 1 min measuring cycle ~ 400 days at 10 min measuring cycle ~ 2 500 days at 60 min measuring cycle

/ PHYSICAL CHARACTERISTICS

	D 50	D 2000	DF 2000
Dimensions without handle (L x W x H) Dimensions with handle (L x W x H)	282 mm x 340 mm x 123 mm 329 mm x 355 mm x 123 mm		
System operating range - Temperature - Atmospheric pressure - Humidity	-10 °C ... +50 °C (+14 ... +122 °F) 700 mbar ... 1100 mbar 0 % rH ... 95 % rH (non-condensing)		
Weight (incl. Internal battery)	6,2 kg (13,7 lbs)		7 kg (15,4 lbs)
Resolution of graphic display	160 x 104 pixels		
Operation from internal battery in diffusion mode	> 10 days		