

# AlphaGUARD D series

## Professional radon monitor

- High sensitivity and fast linear response at  
2 ... 2 000 000 Bq/m<sup>3</sup>, 5 cpm at 100 Bq/m<sup>3</sup>,  
0,05 ... 54 000 pCi/l, 5 cpm at 3 pCi/l
- Multiparameter features / flow & diffusion operation
- Long-term stable calibration
- Complete system for measuring Radon in air, water, soil  
gas and building material



AlphaGUARD D series

Characteristics		D50	D2000	DF2000
Type of radon detector	Ionization chamber, HV ≈ 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)			
Radon progeny filter, entry window	Fine dust filter (retention coefficient > 99.9%)			
Detector filling mechanism	Optimized design for fast passive diffusion or Flow through operation with internal pump			
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), online cross-correlation algorithms			
Detector efficiency	1 cpm at 20 Bq/m <sup>3</sup> (or at 0.55 pCi/L)			
Detector efficiency in Rn/Tn discrimination mode				
- for radon	N/A		1 cpm at 60 Bq/m <sup>3</sup> (1.6 pCi/L)	
- for thoron at 1 L/min flow rate			1 cpm at 200 Bq/m <sup>3</sup> (5.5 pCi/L)	
- for thoron at 2 L/min flow rate			1 cpm at 140 Bq/m <sup>3</sup> (3.8 pCi/L)	
Background signal due to internal detector contamination	< 1 Bq/m <sup>3</sup> (0.03 pCi/L)			
Radon (Rn-222) measurement range	2 Bq/m <sup>3</sup> ... 50,000 Bq/m <sup>3</sup> (<0.05 pCi/L ... 1,350 pCi/L)	2 Bq/m <sup>3</sup> ... 2,000,000 Bq/m <sup>3</sup> (<0.05 pCi/L ... 54,000 pCi/L)		
Thoron (Rn-220) measurement range	N/A		2 Bq/m <sup>3</sup> ... 2,000,000 Bq/m <sup>3</sup> (<0.05 pCi/L ... 54,000 pCi/L)	
LCD display resolution	1 Bq/m <sup>3</sup> (0.01 pCi/L)			
Fold-back protection	> 10,000,000 Bq/m <sup>3</sup> (> 300,000 pCi/L) verified			
System linearity error	< 3% within total range			
Instrument calibration error, Rn-222	± 3% (plus uncertainty of primary standard)			
Measurement modes and cycles	10 min, 60 min (diffusion)		10 min, 60 min (diffusion) 1 min, 10 min (flow) 10 min (Rn/Tn mode) Interval mode (applicable for flow mode)	
Flow range of pump	N/A		Flow-regulated: 0.05 - 0.5, 1, 2 L/min	
Data capacity (non-volatile)	Up to 60,000 measurement points ~ 400 days for 10 min measuring cycle ~ 2,500 days for 60 min measuring cycle		Up to 60,000 measurement points ~ 40 days for 1 min measuring cycle ~ 400 days for 10 min measuring cycle ~ 2,500 days for 60 min measuring cycle	
Graphic display resolution	160 x 104 pixels			
Battery life (diffusion mode)	Up to 10 days		Up to 10 days	
Battery life (flow mode)			> 10 h	
Weight (incl. internal battery)	6.2 kg (13.7 lbs)		7 kg (13.7 lbs)	
Dimensions without handle (L x W x H)	282 mm x 340 mm x 123 mm			
Dimensions with handle (L x W x H)	329 mm x 355 mm x 123 mm			
System operating range				
- Temperature	-10°C ... +50°C (+14°F ... +122°F)			
- Atmospheric pressure	700 mbar ... 1100 mbar			
- Humidity	0% rH ... 95% rH (non-condensing)			
External power consumption	100 - 240 V (400 mA)			
Line frequency	50 - 60 Hz			

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## AlphaGUARD Models – Characteristics and Application Areas

	D50	D2000	DF2000
<b>Measurement range</b>	2 to 50 000 Bq/m <sup>3</sup>	2 to 2 000 000 Bq/m <sup>3</sup>	2 to 2 000 000 Bq/m <sup>3</sup>
<b>Storage capacity</b>	60 000	60 000	60 000
<b>2 x ext. analog input</b>	✓	✓	✓
<b>2 x ext. counter input</b>	✓	✓	✓
<b>Diffusion mode</b>	✓	✓	✓
<b>Flow mode (internal pump)</b>	✗	✗	✓
<b>Measuring cycles (diffusion)</b>	10 min, 60 min	10 min, 60 min	10 min, 60 min
<b>Measuring cycles (flow)</b>	✗	✗	1 min, 10 min, 10 min (Rn/Tn mode), Interval mode
<b>Radon in air</b>	✓ Diffusion	✓ Diffusion	✓ Diffusion and flow
<b>Radon/thoron discrimination</b>	✗	✗	✓
<b>Radon in soil gas*</b>	✗	✗	✓ With soil gas probe
<b>Radon in water samples*</b>	✗	✗	✓ With AquaKIT
<b>Radon progenies*</b>	✓ With AlphaPM	✓ With AlphaPM	✓ With AlphaPM
<b>Dose rate*</b>	✓ With dose rate module	✓ With dose rate module	✓ With dose rate module
<b>Multisensor Unit*</b>	✓	✓	✓
<b>Calibration measurements*</b>	✓ Inside container by diff.	✓ Inside container by diff.	✓ Inside/outside container by diffusion/flow
<b>Emanation measurements*</b>	✓ Inside container by diff.	✓ Inside container by diff.	✓ Inside/outside container by diffusion/flow
<b>Exhalation measurements*</b>	✓ Inside radon box by diffusion	✓ Inside radon box by diffusion	✓ Inside/outside radon box by diffusion/flow

\*Optional/external accessories required

## Multiparameter features

<b>Atmospheric air pressure</b> - Type of sensor - Measurement range - Resolution / Initial calibration uncertainty	Piezo-resistive semiconductor 700 mbar ... 1100 mbar 0.1 mbar / ± 3 mbar	<b>Relocation sensor</b> - Type of sensor - Events detected - Designation for DataVIEW PRO or DataEXPERT 10	3-axis, capacitive semiconductor sensor Gentle acceleration (low-freq. only) Number of events per cycle (max. 254)
<b>Ambient temperature (sensor in ionization chamber)</b> - Type of sensor - Measurement range - Resolution / Initial calibration uncertainty	Band gap semiconductor - 20°C ... + 70°C (- 4°F ... + 158°F) 0.1°C (0.1°F) / ± 1.5°C (+/-2.5°F)	<b>Mains power monitor</b> - Operating principle - Events detected - Designation for DataVIEW PRO or DataEXPERT 10	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
<b>Relative air humidity (sensor in ionization chamber)</b> - Type of sensor - Measurement range - Resolution - Initial calibration uncertainty	Capacitive semiconductor 0% rH ... 99% rH 0.1% rH ± 3% rH	<b>External counter signal channels 1 &amp; 2</b> - Operating principle - Events detected - Measurement range - Designation for DataVIEW PRO or DataEXPERT 10	Pulse counter Counts per minute (cpm) 0 ... 10 kHz Series of statistical values of pulse rate
<b>External sensor channels 1 &amp; 2</b> - Measurement range - Resolution - 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 kΩ HIROSE HR10A-10R-10PB	<b>Gamma dose rate channel (option)</b> - Type of sensor - Measurement range - Initial calibration uncertainty - Resolution displayed onscreen	Geiger-Müller tube 20 nSv/h ... 10 mSv/h ± 20 rel. % 1 nSv/h