

AT6101DR/1 Spectrometer

Radiation background measurement and no-sampling radiometry



Multifunction portable spectrometer is designed for radiation control of water, agricultural products, seafood, raw materials and other substances without prior sampling and sample preparation.

Measurement in 4π geometry is supported when spectrometer's detection device is inserted into controlled material.

Spectrometer features:

- Identification of ^{134}Cs , ^{137}Cs , ^{40}K
- Measurement of specific activity for ^{134}Cs , ^{137}Cs , ^{40}K
- Measurement of gamma radiation ambient dose equivalent rate.



Detection device in a shock-resistant, dust-and-moisture-proof container registers gamma radiation of controlled radionuclides. Detection device sends spectrometric data to hand-held PC (Tablet PC) by wireless communication channel for displaying on screen.



Instrumental spectra processing algorithms in hand-held PC (Tablet PC) software are used for displaying data on radioisotope composition or specific activity for certain radionuclides.

The value of gamma radiation ambient dose equivalent rate in inspection point is determined by means of instrument spectrum analysis with "spectrum-dose" operational function.

Features

- Wireless communication between detection device and hand-held PC (Tablet PC) at distance up to 10 m
- Internal GPS-module for geo-referencing of measurement data
- Instant detection of near background dose rate level increase
- Automatic LED stabilisation and measurement path temperature compensation
- Setting up procedure and parameter check using check sample that contains KCl salt with naturally occurring radionuclide ^{40}K
- Expert mode for detailed instrument spectrum analysis with automatic sample radionuclide content identification
- Records and stores in non-volatile memory up to 140,000 measured instrument spectra
- All measurement data can be transferred to PC for further detailed processing by dedicated GARM software
- Display of measurement results with GPS-referencing (for Tablet PC version)

Specification

Gamma radiation detector	Scintillator, NaI(Tl) Ø63x160 mm	
Energy range	50 keV – 3 MeV	
Specific activity measurement range for 4π measurement geometry	^{134}Cs	10 – $1 \cdot 10^5$ Bq/kg
	^{137}Cs	10 – $1 \cdot 10^5$ Bq/kg
	^{40}K	150 – $1 \cdot 10^4$ Bq/kg
Limits of tolerable intrinsic relative error of specific activity measurement	±20%	
Ambient gamma radiation dose equivalent rate measuring range	0.03 – 50 $\mu\text{Sv/h}$	
Limits of tolerable intrinsic relative error of dose rate measurement	±20%	
Energy dependence relative to 662 keV (^{137}Cs)	±20%	
Typical sensitivity to ^{137}Cs gamma radiation	4750 cps/($\mu\text{Sv} \cdot \text{h}^{-1}$)	
Response time for dose rate change from 0.1 to 1 $\mu\text{Sv/h}$	<2 s (accuracy error $\leq \pm 10\%$)	
Typical resolution at 662 keV (^{137}Cs)	9.5%	
Maximum input statistical load	$\geq 5 \cdot 10^4 \text{ s}^{-1}$	
Number of ADC channels	1024	
Operation mode setup time	1 min	
Integral nonlinearity	1% max.	
Continuous run time	≥ 9 h	
Measurement instability during continuous service	1% max.	
Working temperature range	-20°C to +50°C	
Relative air humidity with temperature $\leq 35^\circ\text{C}$ without condensation	$\leq 95\%$	
Burn-up life	≥ 100 Sv	
Protection class	IP67	
Overall dimensions, weight	125x140x625 mm, 7 kg	
	Detection unit	4.7"
	Hand-held PC	10"
	Tablet PC	10"
The spectrometer complies with: GOST 27451-87, Safety requirements of IEC 61010-1:2010, EMC requirements of EN 55011:2009, IEC 61000-4-2:2008, IEC 61000-4-3:2008, IEC 61000-4-4:2004, IEC 61000-4-5:2005, IEC 61000-4-6:2008, IEC 61000-4-11:2004		

Design and specifications are subject to change without notice



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Zievert
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Zievert, Inc.
6 Huron Dr. Suite 1B
Natick, MA 01760 | +1 (508) 653-7100
www.zievert.com | sales@zievert.com
Official distributor in USA and Canada