Spectrometer AT6101D

No-sampling radiometry

Applications

- ^{137}Cs content control in various plant raw materials
- Radioactive waste control
- Construction material and products radiation monitoring
- Nuclear industry
- Geological survey
- Research activities
- Emergency situations
- Monitoring of soils and subsoils contamination by ^{137}Cs radionuclide in naturally-occurring conditions

AT6101D Portable multifunction scintillation gamma spectrometer is designed to measure specific effective activity value for ^{40}K, ^{226}Ra, ^{232}Th natural radionuclides in construction materials, raw and manufactured products, manufacturing waste and other objects of environment, as well as measurement of ^{137}Cs surface activity in soils and subsoils, and ^{137}Cs specific activity in agricultural raw materials, forestry products and construction materials.

In situ measurement are made for 2π and 4π geometries without preliminary sampling.

Operating principle

Detection unit in a shock-resistant, dust-and-moisture-proof container registers gamma radiation of controlled radionuclides.

Spectrometric information from the detection unit is transferred into processing unit (PU) and is displayed on LCD screen.

Instrumental spectra processing algorithm allows data display in the form of specific effective activity of natural radionuclides, their concentration, specific effective activity of ^{137}Cs natural radionuclide and its concentration.

Ambient gamma radiation dose equivalent rate value in inspection point is determined by instrument spectrum analysis with “spectrum-dose” operational function.

Radioactive anomalies are searched in integral count rate measurement mode.

Features

- Spectrometric detection unit
- Measurement in 2π and 4π geometries (on a surface and inside a well)
- Continuous automatic LED stabilisation of identification device energy scale, periodic readjustment of identification device energy scale with integrated reference KCl sample
- Digital measurement path temperature compensation
- Recording and storing in memory up to 300 spectra
- Ready for field operation
- Shock-resistant, dust-and-moisture-proof construction

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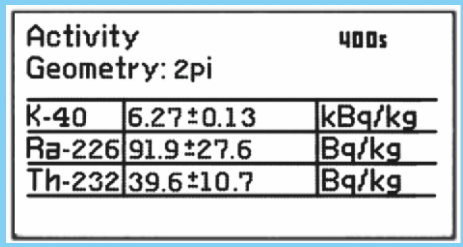
Specification

Detectors	
BDKG-11	Scintillator NaI(Tl),Ø63x63 mm
Energy range	40 keV...3 MeV
Activity measurement range	
Geometry: 2π	
Surface activity of ^{134}Cs and ^{137}Cs	4 – 3700 kBq/m^2 (0.1 – 100 Ci/km^2)
Specific effective activity of ^{40}K, ^{226}Ra, ^{232}Th	100 – 10^4 Bq/kg
Geometry: 4π	
Specific activity of ^{134}Cs and ^{137}Cs	50 – 10^6 Bq/kg
Specific effective activity of ^{40}K, ^{226}Ra, ^{232}Th	50 – 10^4 Bq/kg
Intrinsic relative error of monitored radionuclide concentration measurement	±20% max.
Measurement range of ambient radiation dose rate equivalent	0.01...100 μSv/h
Sensitivity to gamma radiation	
^{241}Am	11600 cps/μSv·h^{-1}
^{137}Cs	2200 cps/μSv·h^{-1}
^{60}Co	1200 cps/μSv·h^{-1}
Response time for dose rate change from 0.1 μSv/h to 1 μSv/h	<2 s (accuracy error ≤±10%)
Intrinsic relative error of ambient gamma radiation dose equivalent rate measurement	±20% max.
Integral nonlinearity	±1% max.
Typical resolution at 662 keV (^{137}Cs)	8%
Maximum input statistical load	≥5·10^4 s^{-1}
Number of ADC channels	512
Internal battery run time	≥12 h
Energy scale instability during continuous service	±1.5% max.
Operation mode setup time	≤10 min
Working temperature range	-20°C...+50°C
Relative humidity with air temperature ≤35°C without condensation	≤95%
Burn-up life	≥100 Sv
Protection class	IP54
Power supply	Internal battery
Overall dimensions, weight	
BDKG-11 in protection container	Ø121x477 mm, 4.0 kg
Processing unit	110x230x38 mm, 0.8 kg

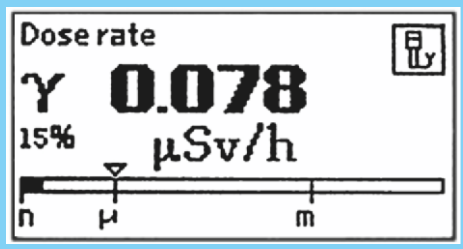
Design and specifications are subject to change without notice

Capabilities

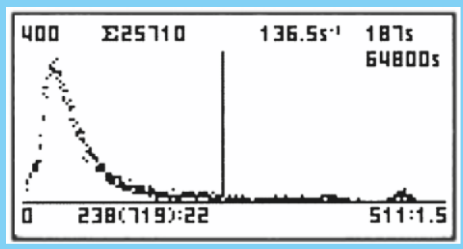
Radionuclide activity identification



Gamma radiation dose rate measurement



Spectrum displaying and processing



AT6101D Spectrometer meets Safety standard requirements:
IEC 61010-1:1990
EMC requirements:
EN 55011:2009
IEC 61000-4-2:2008
IEC 61000-4-3:2008
IEC 61000-4-6:2008

AT6101D Spectrometer has the pattern approval certificates of Republic of Belarus, Russian Federation, Ukraine and Kazakhstan.

ATOMTEX®
http://www.atomtex.com
5, Gikalo st.,220005 Minsk, Republic of Belarus
Tel./fax: +375 17 2928142
E-mail: info@atomtex.com

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