

AT6101CE Spectrometer

**Backpack-based
Radiation
Detector
with high
energy
resolution**



BDKG-35 (γ)

BDKG-05S (γ)

BDKN-05M (n)

The spectrometer is designed for inconspicuous detection of radiation sources and is an effective tool for prevention of radiological threats and other unauthorized activities, e.g. illicit storage, use, transfer and traffic of radioactive materials.

Can be used for radiation monitoring of areas, routes, buildings with GPS-referencing.

Basic version of the spectrometer fits in a backpack (Backpack-based Radiation Detector). For better experience on-board a vehicle, the spectrometer can be delivered in a rugged case (*option*).

The spectrometer fitted in plastic cabinet (*option*) can be used as spectrometric radiation portal monitor to scan pedestrians at checkpoints.

**Rugged Android
smartphone
(4.7" or 6")
for control
and indication**



AT6101CE configuration:

- **BDKG-05S** SrI₂(Eu)-based spectrometric gamma radiation detection unit (*basic version*)
- **BDKG-35** High-sensitivity plastic-based gamma radiation detection unit
- **BDKN-05M** He-3-based neutron radiation detection unit (*option*)

Application

- Control of radioactive materials traffic
- Control of public events radiation safety
- Radiation protective measures in case of nuclear emergencies
- Radiation control of facilities and areas
- Dosimetric and spectrometric survey of land and facilities, radioactive mapping

Our Customers

- Organisations for nuclear energy use control
- Security service
- Customs service
- Border control service
- Radiation monitoring service
- Emergency rescue squads

Features

- SrI₂(Eu) scintillator with high energy resolution: 3.2% for 662 keV (¹³⁷Cs)
- Reliable identification of complex radionuclide mixtures
- 20 hours of continuous operation time, memory for 130 hours of scan time
- Automatic simultaneous gamma and neutron radiation scanning with radionuclide identification
- Continuous recording of scan data with GPS-referencing for further analysis
- Automatic accommodation to changes in radiation background level
- Simultaneous measurement of gamma radiation spectral distribution and dose rate
- Expert-level "GARM" software for further data processing and analysis



ATOMTEX[®]

INSTRUMENTS AND TECHNOLOGIES FOR NUCLEAR
MEASUREMENTS AND RADIATION MONITORING

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Operating principle

All detection units are smart devices and can transmit measurement data over Bluetooth wireless link into the smartphone.

The spectrometer operates in continuous radiation environment scan mode: continuous search, detection, localization and identification of gamma sources; search and detection of neutron radiation sources.

When a radioactive source is detected, the spectrometer generates an alarm and identifies radionuclide composition of the source.

The smartphone displays the types of identified radionuclides and operator hears a corresponding voice message in a wireless headset. The scan results are continuously saved into memory for further processing and analysis on a PC and can be mapped using the application software.



Basic spectrometer arrangement

Inside a backpack without identification marks for concealed operation

Optional spectrometer arrangement

Inside a rugged case for better experience on-board a vehicle



Inside a fixed plastic cabinet for comfortable operation at checkpoints

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Specification		AT6101CE	
GAMMA RADIATION DETECTION UNIT		BDKG-05S	BDKG-35
Detector		Scintillator, SrI ₂ (Eu) Ø38x38 mm	Scintillation plastic Ø70x150 mm
Energy range		20 keV – 3 MeV (In Spectrometric mode) 50 keV – 3 MeV (In Dosimetric mode)	
Measurement range of ambient dose equivalent rate		0.03 – 150 µSv/h Limits of tolerable intrinsic relative error: ±20%	
Typical sensitivity to gamma radiation		cps/(µSv·h ⁻¹) 15000* (²⁴¹ Am) 4500* (¹³⁷ Cs) 2400* (⁶⁰ Co)	
Identified radionuclides		Industrial, natural, medical (The library content can be modified on request)	
Detectable activity of ¹³⁷ Cs source, moving at the speed of 0.6 m/s and located at the distance of 1 m in a time not longer than 2 s		350 kBq* 95% probability of source detection with false alarm rate not above 1 in 10 min	
Alarm activation time		<2 s	
Typical resolution at 662 keV (¹³⁷ Cs)		3.2% (BDKG-05S)	
Number of ADC channels		1024 (BDKG-05S)	
Maximum input statistical load		≥2·10 ⁴ s ⁻¹ (BDKG-05S)	
* Configuration with BDKG-05S and BDKG-35 detection units			
NEUTRON RADIATION DETECTION UNIT		BDKN-05M	
Detector		2 proportional counters ³ He Ø30x360 mm in a polyethylene moderator	
Energy range		0.025 eV – 14 MeV	
Typical sensitivity to ²⁵² Cf neutron radiation		20 cps/(neutron·s ⁻¹ ·cm ⁻²) (5.00±1.25)·10 ⁴ neutron/s	
Detectable activity of Pu-Be source, located at the distance of 1.25 m in a time not longer than 3 s		95% probability of source detection with false alarm rate not above 1 in 1 h	
Other parameters and operating conditions			
GPS		Smartphone with integrated GPS receiver; Positioning accuracy ≥3 m	
Burn-up life		≥100 Sv	
Protection class	backpack rugged case plastic cabinet	IP55 IP65 IP30	
Continuous operation time		~20 h	
Working temperature range		-20°C to +50°C	
Relative air humidity		≤95% (with air temperature ≤35°C without condensation)	
Overall dimensions	backpack rugged case plastic cabinet	520x380x220 mm 594x473x215 mm 500x500x190 mm	
Weight**	backpack rugged case plastic cabinet	7.5 kg 16 kg 19 kg	
** Configuration with BDKG-05S, BDKG-35 and BDKN-05M detection units			

Design and specifications are subject to change without notice