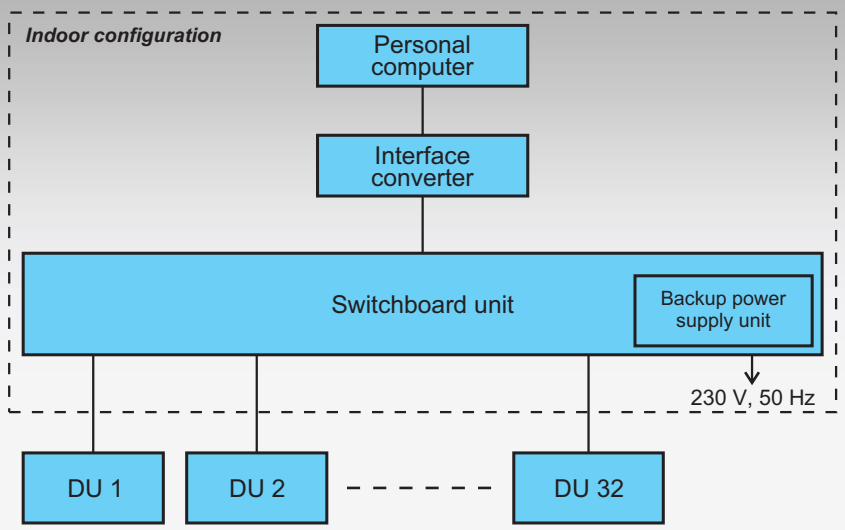
AT6105 Spectrometric System for Radiation Monitoring

AT6105 system architecture



This stationary system is designed for continuous and uninterrupted dosimetric and spectrometric radiation monitoring of land, facilities, wells and other sites.

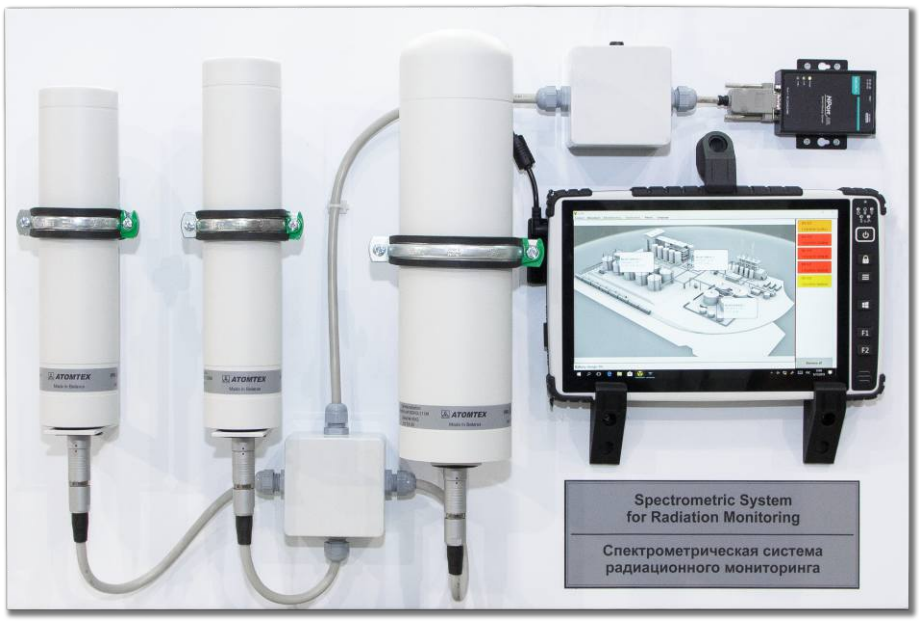
The System is a network of interconnected gamma radiation detection units with connection to PC. Detection units are monitored and controlled by "SSRM" software to collect and display all measurement data on PC screen.

No switchboard unit is used for single-channel variant (AT6105 with one detection unit).

Operating principle

AT6105 operating principle is based on intermittent reading of dose rate measurement result and instrument spectrum of gamma radiation for each detection units in the system. The measured spectrum is used to identify the composition of gamma radiation source.

If dose rate value transmitted by the Detection unit exceeds "Alarm" threshold setting or an "alarming" nuclide has been identified (software setting for each detection unit), the system initiates a sound and visual alarm on the PC.



Applications

- Well monitoring in radioactive waste disposal sites
- Monitoring of radioactive and nuclear material waste repository areas
- Part of radionuclide certification service
- Induced-radioactivity well survey
- Liquid radioactive waste monitoring

Features

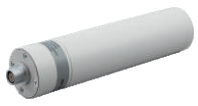
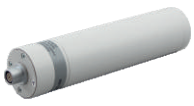
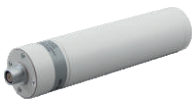
- Separate display of spectra and dose rate data by each detection unit on site plan or terrain map
- Energy range expandable to 5 MeV
- Up to 32 detection units
- Sealed detection unit construction

System functions

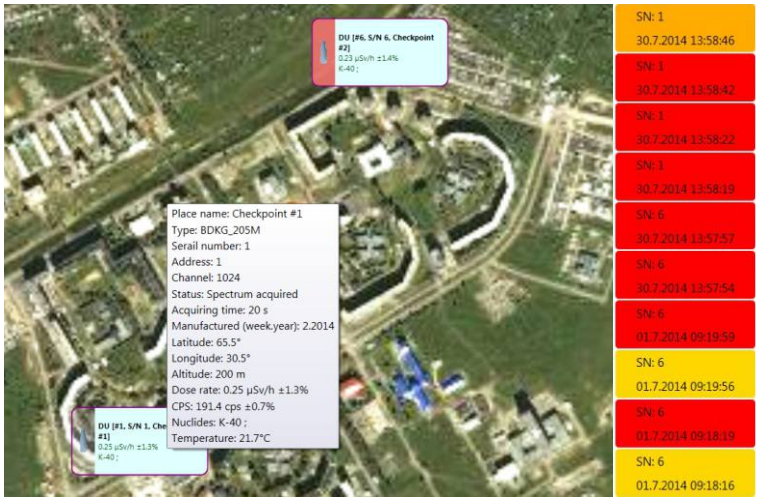
- Continuous measurement of gamma radiation spectra in a set period of time
- Measurement of gamma radiation dose rate
- Identification of source radionuclide composition
- Evaluation of exceeded dose rate threshold
- Activation of sound and light alarm when threshold levels are exceeded or monitored radionuclides are identified
- All data stored in a log and event history
- Test of detection unit operation
- Detection unit stabilisation by check sample

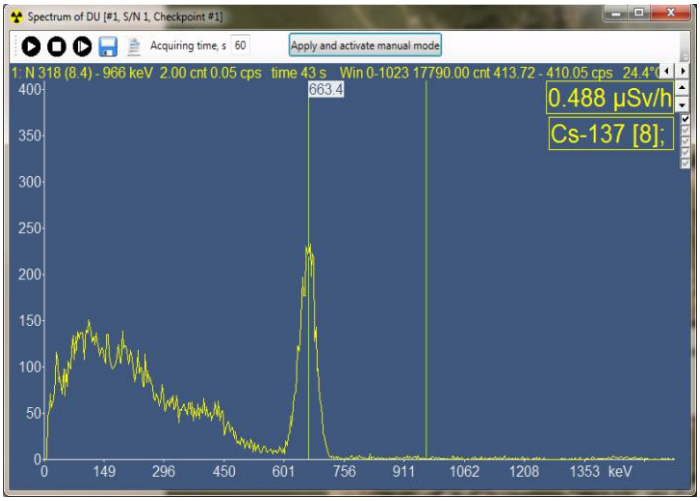
AT6105 Spectrometric System for Radiation Monitoring

System specification	
Number of detection units	1 – 32
Maximum communication line distance between detection units and PC	1000 m
Maximum communication line distance between switchboard unit and PC	100 m
Identified radionuclides	Medical ▪ Industrial ▪ Natural *(Library of identified radionuclides can be modified)*
Initialisation time	≤1 min
Continuous run time	24 h for AC supply, 110-230 V, 50-60 Hz; 6 h for self-contained power supply from fully charged battery pack
PC interface	USB / Ethernet / Bluetooth (via interface adapter)

System detection units specifications						
Detection unit		**BDKG-201M**	**BDKG-203M**	**BDKG-205M**	**BDKG-211M**	**BDKG-219M**
Scintillation detector		NaI(Tl) Ø25x16 mm	NaI(Tl) Ø25x40 mm	NaI(Tl) Ø40x40 mm	NaI(Tl) Ø63x63 mm	NaI(Tl) Ø63x160 mm
Energy range		20 keV – 3 MeV				
Measurement range of ambient dose equivalent rate		50 nSv/h – 1 mSv/h	30 nSv/h – 500 μSv/h	30 nSv/h – 300 μSv/h	30 nSv/h – 120 μSv/h	30 nSv/h – 50 μSv/h
		Limits of tolerable intrinsic relative error: ±20%				
Energy dependence relative to 662 keV (^{137}Cs)		±15% (for energy range from 50 keV to 3 MeV)				
Typical resolution at 662 keV (^{137}Cs)		8.5%	8%	7.5%	7.5%	8%
Typical sensitivity to gamma radiation, cps/(μSv·h^{-1})	^{241}Am ^{137}Cs ^{60}Co	1400 165 80	3600 400 190	5400 800 420	13900 2450 1300	37000 6000 2500
Response time for dose rate change from 0.1 to 1 μSv/h		≤2 s (accuracy error ≤±10%)				
Maximum input statistical load		10^5 s^{-1}				
Number of ADC channels		1024				
Radiation overloading		Detection unit withstands 10-fold measurement range upper limit increase for up to 5 min during gamma radiation dose rate measurement				
Burn-up life		≥100 Sv				
Protection class		IP68 (Fresh water measurement at depths up to 50 m. Holds hydrostatic pressure up to 5 atm or 0.6 MPa)				
Interface		RS485				
Operation temperature range		-35°C to +55°C				
Relative humidity		≤98% (with air temperature ≤35°C without condensation)				
Overall dimensions, weight		Ø63x313 mm, 1 kg	Ø63x333 mm, 1 kg	Ø63x333 mm, 1 kg	Ø90x350 mm, 2 kg	Ø90x430 mm, 3.3 kg
Design and specifications are subject to change without notice						

"SSRM" Software





ATOMTEX®
http://www.atomtex.com

Corporate Member of European Nuclear Society

Zievert
a CapeSym Company

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