



*State Sanitary-Epidemiological  
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### ***Branches of Use***

- Customs and Border Services
- Law enforcement agencies (Ministry of Internal Affairs, State Security Services)
- Vehicles monitoring, seaports and airports
- Environmental inspectorates
- Sanitary and epidemiological services
- Radioactive waste storage sites

### ***Purpose of Use***

- Measurement of gamma and X-ray radiation ambient dose equivalent rate (photon-ionizing radiation DER).
- Determination of neutron radiation intensity (for MKS - 1 1 GN only).
- Identification of radionuclide type.
- Accumulation, storage of amplitude gamma spectra in the nonvolatile memory and their identification.

### ***Application***

The MKS-1 1 "SPECTRA" search dosimeter-radiometer is designed to detect, localize and identify radioactive and nuclear materials of gamma and neutron (for MKS - 1 1 GN only) radiation for prevention of their illicit trafficking, as well as at enterprises and organizations handling gamma and neutron (for MKS - 1 1 GN only) radiation sources.

### ***Features***

- High sensitivity gamma scintillation (CsI) detector, Geiger-Muller counter, scintillation (LiI) detector of neutron radiation (for MKS - 1 1 GN only).
- Indication and automatic testing mode of power supply status.
- Data communication between the detecting device (DD), the control and indication device (CID) and the PC is done via Bluetooth wireless technology.
- Storage and transfer of 1 28 complete gamma radiation spectra.

- Identification of radionuclides and their category(ies) (in compliance with IAEA requirements):
  - medical radionuclides:  $^{18}\text{F}$ ,  $^{67}\text{Ga}$ ,  $^{99\text{m}}\text{Tc}$ ,  $^{111}\text{In}$ ,  $^{123}\text{I}$ ,  $^{131}\text{I}$ ,  $^{201}\text{Tl}$ ;
  - industrial radionuclides:  $^{57}\text{Co}$ ,  $^{60}\text{Co}$ ,  $^{133}\text{Ba}$ ,  $^{137}\text{Cs}$ ,  $^{192}\text{Ir}$ ,  $^{152}\text{Eu}$  and  $^{241}\text{Am}$ ;
  - special nuclear materials:  $^{233}\text{U}$ ,  $^{235}\text{U}$ , Pu [Reactor grade plutonium (more than 6%  $^{240}\text{Pu}$ )];
  - naturally occurring radioactive materials:  $^{40}\text{K}$ ,  $^{226}\text{Ra}$ ,  $^{232}\text{Th}$ -decay series,  $^{238}\text{U}$ -decay series.

**Note.** List of nuclides that the device can identify may be extended if needed.

- Threshold alarm system with three independent threshold levels:
  - search threshold level (threshold level of photon-ionizing count rate from the detector);
  - safety threshold level (threshold level of photon-ionizing radiation DER);
  - threshold level of neutron count rate from the detector.

### Specifications

Gamma radiation sensitivity for $^{137}\text{Cs}$ , not less than	$\frac{\text{cps}}{\mu\text{Sv/h}}$	100
Neutron radiation sensitivity for (for MKS - 11GN only):		
- fast neutrons, not less than	$\frac{\text{pulse} \times \text{cm}^2}{\text{n}}$	$0.120 \pm 0.012$
- thermal neutrons, not less than		$1.2 \pm 0.12$
Measurement range of photon-ionizing radiation DER	$\mu\text{Sv/h}$	0.01 ... 9999
Indication range of photon-ionizing radiation count rate	cps	1 ... 9999
Indication range of neutron radiation count rate (for MKS - 11GN only)	cps	0.01 ... 9999
Main relative permissible errors limit of photon-ionizing radiation DER measurement in the range of 0.01 - 9999 $\mu\text{Sv/h}$ ( $^{137}\text{Cs}$ )	%	$\pm(15 + 1/\dot{H}^*(10))$ , where $\dot{H}^*(10)$ is a numeric value of measured DER equivalent to $\mu\text{Sv/h}$
Energy range of registered photon-ionizing radiation	MeV	0.033 ... 3.000
Energy dependence of the device readings during photon-ionizing radiation DER measurement in the energy range from 0.05 to 3.00 MeV relative to 0.662 MeV energy ( $^{137}\text{Cs}$ )	%	$\pm 25$

***Specifications (continued)***

Energy range of registered neutron radiation (for MKS -11GN only)	MeV	from thermal neutrons to 14.00
Number of amplitude gamma spectrum channels	channel	1024
Setup time of operating mode of the device, not more than	min	1
Calibration time relative to gamma background	s	2 ... 60
Time of continuous operation with fully charged storage batteries at gamma background (not more than 0.5 $\mu$ Sv/h) with switched off display backlight and under non-alarm conditions, not less than	hours	30
Operating temperature range	$^{\circ}$ C	- 20 ... + 50
Dimensions of the detecting device (DD), not more than	mm	110 x 36 x 83
Weight of the DD, not more than	kg	0.4
Dimensions of the control and indication device (CID) without a strap, not more than	mm	70 x 80 x 32
Weight of the CID, not more than	kg	0.13
Weight of the device kit in packaging, not more than	kg	1.5

***Delivery Kit***

- control and indication device;
- detecting device;
- AA NiMH storage battery;
- AAA NiMH storage batteries (2 pcs.);
- battery charger;
- leather case;
- screwdriver;
- operating manual;
- packing case.

