

★ MKS-11GN SPECTRA SPRD Search Dosimeter-Radiometer



NSN 6665 61 016 9200

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SPRD SPECTRA intended to detect, localize and identify radioactive and nuclear materials by their gamma and neutron radiation as well as the amplitude gamma spectra. The device identifies radionuclides with indication of the category that they belong to (in compliance with the IAEA requirements). It is used to prevent illicit transfer of these materials across the state borders, as well as at the companies and institutions dealing with gamma and neutron radiation sources.

Available in two colours: yellow and olive green (NATO green). Upon customer's request we can produce SPECTRA in only gamma version (without neutron channel).

Complies with the ANSI 42.48 & ANSI 42.32, ANSI 42.33.

Purpose Of Use

- Identification of the radionuclides type by their amplitude gamma spectra
- Determination of gamma and neutron radiation intensity
- Measurement of ambient dose equivalent rate (DER) of gamma and X-ray radiation (photon-ionizing radiation)

- Indication of ambient dose equivalent rate (DER) of neutron radiation
- Measurement of ambient dose equivalent (DE) of gamma and X-ray radiation
- Saving amplitude gamma spectra and events logs in the non-volatile memory

Features

- High sensitivity CsI(Tl) scintillation detectors of gamma and LiI(Eu) of neutron radiation with solid state (silicon) photomultiplier
 - Color display with high resolution
 - Storage and transfer of 250 complete gamma radiation spectra
 - Powerful CPU and improved algorithms for spectra processing
 - New software for detailed laboratory research and spectra processing
 - No "microphone effect"
 - High thermal stability
 - Powered by built-in lithium polymer storage batteries that can be charged via USB cable
 - The dosimeter communicates with a PC via USB port
 - Real-time identification of spectra
 - Identification of radionuclides with specification of the categories they belong to (in compliance with IAEA requirements):
 - medical radionuclides: ^{18}F , ^{67}Ga , ^{51}Cr , ^{75}Se , ^{89}Sr , ^{99}Mo , $^{99\text{m}}\text{Tc}$, ^{103}Pd , ^{111}In , ^{123}I , ^{125}I , ^{131}I , ^{153}Sm , ^{201}Tl , ^{133}Xe
 - industrial radionuclides: ^{57}Co , ^{60}Co , ^{133}Ba , ^{137}Cs , ^{192}Ir , ^{152}Eu , ^{22}Na , ^{241}Am
 - special nuclear materials: ^{233}U , ^{235}U , ^{237}Np , Pu [[Reactor grade plutonium (more than 6% ^{240}Pu)]]
 - naturally occurring radioactive materials: ^{40}K , ^{138}La , ^{226}Ra , ^{232}Th -decay series, ^{238}U -decay series
- Note: The list of nuclides the device is able to identify may be extended if needed

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- Threshold alarm system with four independent threshold levels:
 - search threshold levels (threshold level of count rate from the detector photon and neutron ionizing radiation)
 - safety threshold level (threshold level of photon ionizing radiation DER)
 - accumulated dose threshold level
- Light color alarm (indication) of threshold levels exceeding (gamma radiation – red color, neutron – blue) and visual alarm on the side of the device
- Software is used for:
 - reading measurement results and critical events from the dosimeter memory into the PC
 - report preparation and printout

- display of the obtained dosimetric information with the GPS coordinates on the area map
- display of the accumulated spectra

Delivery Kit

- search dosimeter-radiometer
- charger
- shielded USB cable
- software
- operating manual
- packing case
- sample ^{232}Th (for detector age compensation)

Specifications

Photon-ionizing radiation sensitivity of (^{137}Cs) CsI(Tl) scintillation detector	400 cps/($\mu\text{Sv/h}$)
Upon customer's request the sensitivity can be changed to a value of not less	200 cps/($\mu\text{Sv/h}$)
Neutron radiation sensitivity while using the LiI(Eu) scintillation detector	1.2 ± 0.12 pulse·cm ² /n
• for thermal neutrons, not less	0.12 ± 0.012 pulse·cm ² /n
• for fast neutrons, not less	
Total measurement and display range of photon-ionizing DER	0.01 ... 10^6 $\mu\text{Sv/h}$
• from built-in scintillation detecting unit of photon-ionizing radiation	0.1 ... 50 $\mu\text{Sv/h}$
• from built-in Geiger-Muller counter	50 ... 10^6 $\mu\text{Sv/h}$
Measurement and display range of photon-ionizing DE from the Geiger-Muller counter	0.1 ... $9.9 \cdot 10^6$ μSv
Display range of count rate of photon-ionizing radiation	1 ... 25 000 cps
Display range of neutron radiation DER	0.01 ... 10^4 $\mu\text{Sv/h}$

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Display range of pulse count rate of neutron radiation from the scintillation neutron detecting unit 0.01 ... 19 000 cps

Main relative permissible error limit when measuring photon-ionizing radiation DER from the scintillation detecting unit of photon-ionizing radiation at 0.95 confidence probability (^{137}Cs), where $H^*(10)$ is a dimensionless value numerically equal to value of DER measured in $\mu\text{Sv/h}$ $(15+1/H^*(10))\%$

Main relative permissible error limit when measuring photon-ionizing radiation DER and DE from the Geiger-Muller counter at 0.95 confidence probability (^{137}Cs) 15 %

Energy range of detected photon-ionizing radiation 0.02 ... 3 MeV

Energy dependence of the device's readings when measuring photon-ionizing radiation DER in the energy range from 0.05 MeV to 1.25 MeV relative to 0.662 MeV energy (^{137}Cs) $\pm 25\%$

Resolution of scintillation detecting unit of photon-ionizing radiation for ^{137}Cs , not more 8 %

Energy range of detected neutron radiation $2.5 \cdot 10^{-8}$... 14 MeV

Set-up time of the device operation, not more 1 min

Calibration time by the level of gamma background 2 ... 90 s

Response time to over 10 times change of photon-ionizing radiation DER 0.25 s

Operating supply voltage 3.7 V

Time of continuous operation of the device when powered from the charged lithium-polymer battery under background of gamma radiation not more than $0.5 \mu\text{Sv/h}$

- a switched-off display backlight, with no alarm triggering and a switched-off GPS receiver, not less 200 hrs
- a switched-off display backlight, with no alarm triggering and a switched-on GPS receiver, not less 50 hrs

Operating temperature range $-20 \dots +50 \text{ }^\circ\text{C}$

Dimensions of the device, not more $69 \times 128 \times 45 \text{ mm}$

Weight of the device, not more 0.32 kg

WATCH THE VIDEO



ON YOUTUBE