



## GAMMA-1S

### SCINTILLATION GAMMA SPECTROMETER

#### INTENDED USE

Quantitative estimation of radioactivity level and identification of radionuclides in samples of various types.

The spectrometer allows solving such traditional tasks of spectrometric analysis as monitoring the specific activity of gamma-emitting radionuclides in environmental samples (food products, animal feed, vegetation, soil, building materials and raw materials for them, forestry products, surface water and bottom sediments, finished products, metal alloys, components). It can also be used for radiation monitoring and control of technological processes and inspection for radioactive contamination.

#### APPLICATION

The spectrometer is used in laboratories of the services engaged in radiation monitoring of environmental objects and various products during their extraction, processing, and release.

#### DESIGN AND OPERATION

GAMMA-1S is a NaI(Tl) (63×63) mm based digital scintillation gamma detecting device UDS-GC-63x63-USB placed inside a lead shield.

The sample to be measured is prepared in accordance with the applied sample preparation technique, placed in the standard measurement geometry and installed in the shield on the detecting device cover to perform measurements. The following measuring geometries can be used: Marinelli vessel 1 l, Denta vessel 0.12 l, Petri dish 60 ml.

GAMMA-1S comes with an operator's workstation with installed specialized software (SpectraLineBG) used to manage accumulation, display, processing of information and output of processing results to external computer devices.

#### FEATURES AND FUNCTIONAL CAPABILITY

- Integrated gain stabilization system based on the LED reference peak ensures high stability of the detecting device
- Applied digital signal processing methods ensure the stability of the detecting device (UDS-GC) parameters in high load conditions
- The possibility of software, hardware and methodological coupling with the BETA-1S Scintillation Beta Spectrometer
- Wide range of functions to work with spectra and results of their processing: measurement with time exposure (live or real time), automatic accumulation and processing mode, visualization on the monitor screen, storage in database
- Generation of protocols in accordance with regulations in force; reports are issued on the product categories (building materials, mineral fertilizers, ceramics, food industry products, minerals, forest products, metals, etc)
- Efficiency calibration of the spectrometer is done for a 1 litre Marinelli vessel geometry. Calibrations using other geometries are also possible.





# GAMMA-1S

## SPECIFICATIONS

Operating range of detected gamma energies	50 to 3000 keV
Relative energy resolution for 662 keV ( <sup>137</sup> Cs) peak, max	8 %
Integral non linearity, max	1 %
Maximum statistical load, min	150,000 cps
Range of measured specific activity (the lower limit of the measuring range is defined as the minimum measurable activity (MIA) for a measurement time of 2 hours and an error of 50%, the measurement geometry is a Marinelli vessel 1 l, with water.)	<sup>137</sup> Cs: 1.5 to 10 <sup>5</sup> Bq/kg <sup>40</sup> K: 25 to 10 <sup>5</sup> Bq/kg <sup>232</sup> Th: 3 to 10 <sup>5</sup> Bq/kg <sup>226</sup> Ra: 3 to 10 <sup>5</sup> Bq/kg
Confidence limits of activity measurement error (P=0.95)	±(10 to 50) %
Operating mode setting time, max	30 minutes
Continuous operation, min	24 hours
Time instability for continuous operation period, max	±1 %
Operating geometries	volumetric, not exceeding 1 l
Power supply	~220 V, (50±1) Hz, 250 V·A
Operating conditions	+10 to +35 °C, humidity up to 75% at +30 °C and lower temperatures without moisture condensation
Overall dimensions and weight of the spectrometer parts:	
- Ekran-1SG protective shield	(560×595×772) mm; 231 kg
- UDS-GC-63×63-USB detecting device	(Ø88×345) mm; 2.3 kg

## CERTIFICATION

- Registered in the State Register of Measuring Instruments under No.15294-08
- Complies with the requirements for products of safety class 4N according to OPB-88/97
- Complies with the Customs Union Technical Requirements “Safety of Low Voltage Equipment” (CU TR 004/2011) and “Electromagnetic Compatibility of Technical Means” (CU TR 020/2011)

