



# GAMMA-BETA-1S COMBINED SPECTROMETRIC SYSTEM

## INTENDED USE

The GAMMA-BETA-1S combined spectrometric system is used for qualitative and quantitative analysis of environmental samples, sanitary and hygienic check of food raw materials and food products, forestry products, building materials, as well as for radiation and technological process monitoring.

## APPLICATION

The combined spectrometric system can be used in laboratory conditions for radiation monitoring of environmental objects and various products during their extraction, processing, and release.

## FEATURES

- Lower minimum measurable activity of beta-emitting radionuclides due to possibility to make combined measurements on gamma- and beta spectrometers
- Integrated gain stabilization system based on the LED reference peak ensures high stability of the detecting device, thus eliminating the need of daily energy calibration of the spectrometer
- Wide range of functions to work with spectra and results of their processing, generation and printing out of reports in accordance with the effective regulatory requirements
- Applied digital signal processing methods ensure the stability of the gamma detecting device parameters in high load conditions
- Possibility of individual adjustment for specific measuring tasks of the customer

## DESIGN

GAMMA-BETA-1S is a combination of the GAMMA-1S scintillation gamma spectrometer and the BETA-1S scintillation beta spectrometer at one operator's workstation.

GAMMA-1S includes a NaI(Tl) (63×63) mm based digital scintillation gamma detecting device UDS-GC-63×63-USB, and BETA-1S includes a UDS-B-USB scintillation digital beta detecting device. The detecting devices are placed inside lead shields to decrease gamma background influence and increase accuracy of activity measurement.

The combined spectrometric system allows combined measurements on gamma- and beta spectrometers using a specialized software (SpectralLineBG for two paths), which makes it possible to lower the minimum measurable activity of beta-emitting radionuclides.





# GAMMA-BETA-1S

## SPECIFICATIONS

Range of registered energies	0.05 to 3 MeV (gamma energies) 0.2 to 3 MeV (beta energies)
Range of measured specific activity for radionuclide	1.5 to 10 <sup>5</sup> Bq/kg ( <sup>137</sup> Cs) 17 to 10 <sup>5</sup> Bq/kg ( <sup>90</sup> Sr) 25 to 10 <sup>5</sup> Bq/kg ( <sup>40</sup> K) 3 to 10 <sup>5</sup> Bq/kg ( <sup>232</sup> Th) 3 to 10 <sup>5</sup> Bq/kg ( <sup>226</sup> Ra)
Maximum statistical load, min	1.5×10 <sup>5</sup> cps
Integral non-linearity, max	1 %
Confidence limits of activity measurement error (P = 0.95)	±(10 to 50) %
Time instability over the period of continuous operation, max	±1 %
Operating mode setting time, max	30 min
Continuous operation, min	24 hours
Power supply	~220 V, (50±1) Hz, 500 V·A
Operating conditions	+10 to +35 °C, humidity up to 75% at +30 °C and lower temperatures without moisture condensation
Operating geometry	volumetric, not exceeding 1 l, density of measured samples not more than 3 g/cm <sup>3</sup> standard cuvette: (Ø70×8) mm, volume is 30 ml, sample weight is up to 30 g AFA filter: working surface is 20 cm <sup>2</sup>
Dimensions and weight of the combined spectrometric system parts:	
- UDS-GC-63×63-USB detecting device	(Ø88×345) mm; 2.3 kg
- Ekran-1SG protective shield	(560×595×772) mm; 231 kg
- UDS-B-USB detecting device	(Ø91×290) mm; 1.3 kg
- Ekran-1SB protective shield	(300×467) mm; 95 kg

## CERTIFICATION

- BETA-1S is registered in the State Register of Measuring Instruments under No. 15292-09
- GAMMA-1S is registered in the State Register of Measuring Instruments under No. 15294-08
- BETA-1S and GAMMA-1S comply with the requirements for products of safety class 4N according to OPB-88/97
- BETA-1S and GAMMA-1S comply with the requirements of the Technical Regulations of the Customs Union on safety of low voltage equipment (TR CU 004/2011), Technical Regulations of the Customs Union on electromagnetic compatibility of technical means (TR CU 020/2011)

