



BETA-1S

SCINTILLATION BETA SPECTROMETER

INTENDED USE

BETA-1S is designed to measure the specific activity of beta-emitting radionuclides in environmental samples.

APPLICATION

BETA-1S can be used in laboratory conditions for radiation monitoring of environmental objects and various products during their extraction, processing, and release.

FEATURES

- 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
- The possibility of software, hardware and methodological coupling with the GAMMA-1S Scintillation Gamma 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 reports in accordance with regulations in force; reports are issued on the following product categories:
 - food products;
 - forestry products;
 - feed and feed additives.
- Printing out of processing results and spectrum

DESIGN AND OPERATION

BETA-1S is a UDS-B-USB scintillation digital beta detecting device placed inside the lead shield. The lead shield helps decrease gamma background influence and increase accuracy of activity measurement.

The investigated sample is prepared in accordance with the applied sample preparation method and is placed in a standard cuvette, leveled and compacted in it using the supplied sample compacting device. AFA filters can also be measured by the spectrometer.

BETA-1S comes with the Operator's Workstation with the installed specialized software (SpectralLineBG) used to control data accumulation, display, data processing and to output results of data processing to external devices.





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SPECIFICATIONS

Range of detected beta energies	0.2 to 3 MeV
Relative energy resolution for the 624 keV conversion electrons line (^{137}Cs), max	15 %
Range of specific activity measurement for ^{90}Sr :	(30^* to $1 \cdot 10^5$) Bq/kg – excluding gamma path result (17 to $1 \cdot 10^5$) Bq/kg – including gamma path result for ^{137}Cs and ^{40}K
Limits of tolerable basic relative error for activity measurement of ^{90}Sr radionuclide ($P=0.95$)	$\pm(10 \text{ to } 50) \%$
Operating mode setting time, max	30 minutes
Continuous operation, min	24 hours
Time instability over the period of continuous operation, max	$\pm 1 \%$
Power supply	$\sim 220 \text{ V}$, $(50 \pm 1) \text{ Hz}$, $250 \text{ V} \cdot \text{A}$
Environmental	10 to 35°C , humidity up to 75 % at $+30^\circ \text{C}$ and lower temperatures without moisture condensation
Operating geometry	Standard cuvette: ($\varnothing 70 \times 8$) mm, volume is 30 ml, sample weight is up to 30 g AFA filter: working surface is 20 cm^2
Dimensions and weight: – Ekran-1SB protective shield – UDS-B-USB detecting device	($\varnothing 300 \times 467$) mm; 95 kg ($\varnothing 91 \times 290$) mm; 1.3 kg
Weight	95 kg (Shield-1SB Protective shield) 1.3 kg (UDS-B-USB)

* The lower limit of the measured activity range (i.e. minimum measured activity) is given for the measurement time of 2 hours and error of 50%, measurement geometry is a standard cuvette

CERTIFICATION

- Registered in the State Register of Measuring Instruments under No. 15292-09
- Complies with the requirements for products of safety class 4N according to NP-001-97, NP-001-15, NP-016-05, NP-033-11
- Complies with the requirements of the Technical Regulations of the Customs Union on safety of low voltage equipment (TR CU 004/2011) and Technical Regulations of the Customs Union on electromagnetic compatibility of technical means (TR CU 020/2011)

