

# Radiometer



## RKBA-01 «RADEK»

*laboratory equipment*

**In configuration with the detection unit of alpha-radiation BDA-60**

provides the measurement of total specific activity of alpha – radiating radionuclides in foodstuffs, biological samples and water samples.

**In configuration with the detection unit of beta-radiation BDB-60**

provides the measurement of total specific activity of beta – radiating radionuclides in foodstuffs, biological samples and water samples.

### Features

- Simultaneous and selective measurement of beta- and alpha-radiation
- Software in Windows 98/ME/2000/XP/Vista/7 environment
- Possibility to connect to a PC via different interfaces
- Visualization of measuring process
- Performance of mathematical operations on spectrums
- Performance of activity calculations in process of set of spectrum
- Realization of coincidence schemes/anticoincidence schemes
- Utilization of a barcode-printing system "Shtrih-3" for automatization of routine measurements
- Utilization of changers of samples APU-01 "RADEK"
- Software and hardware compatibility with spectrometer-radiometer of gamma- and beta-radiation MKGB-01 "RADEK"



### Sphere of application

- in laboratories of radiation control for examination of finished goods, starting material, intermediate and concomitant products of technological processes;
- in laboratories of outdoor radiation control centers in the course of environment monitoring;
- in radiological laboratories of the State Sanitary and Epidemiological Supervision, timber industry departments, veterinary and agricultural services;
- in nuclear centers for research in various fields of fundamental and applied physics



### Modifications (standard versions):

- RKBA-01 "RADEK" alpha-beta tract
- RKBA-01 "RADEK" alpha tract
- RKBA-01 "RADEK" beta tract



**Radiometer of alpha- and beta-radiation RKBA-01 "RADEK" is registered in the State Register of Measuring Instruments of RF under № 46530-11.**

**Pattern Approval Certificate of Measuring Instruments RU.C.38.001.A № 42303**

# Radiation ecology

# Radiometer RKBA-01 «RADEK»

## Main characteristics

### Detection units - alpha-radiation

BDA-60.....scintillator (ZnS) Ø 60 mm

### Detection units – beta-radiation

BDB-60.....plastic scintillator Ø60x1 mm

### Energy range

alpha-radiation.....3 – 8 MeV

beta-radiation.....150-3000 keV

### Sensitivity

to alpha – radiation of radionuclide  $^{239}\text{Pu}$  (3P9)..... > 0,3 (imp/s)/Bq

to beta-radiation of radionuclide  $^{90}\text{Sr}$ - $^{90}\text{Y}$  (3S0)..... > 0,24 (imp/s)/Bq

### Background

BDA-60..... < 0,002 imp/s

BDB-60..... < 0,5 imp/s

### Minimum detectable activity with measuring time 3 hours

BDA-60 (of radionuclide  $^{239}\text{Pu}$  of source 3P9)..... < 0,01 Bq

BDB-60 (of radionuclide  $^{90}\text{Sr}$ - $^{90}\text{Y}$  of source 3S0)..... < 0,2 Bq

Maximum input statistical load..... >  $5 \cdot 10^4 \text{ s}^{-1}$

### Instability of readings

(change of sensitivity) per 8 hours of working.....  $\pm 2\%$

Operation mode set time..... < 30 min.

Continuous operation time..... 24 h

Power, from the AC mains with frequency 50 Hz ..... 220 V

Power consumption..... < 200 VA

### Number of channels

for alpha-spectrums..... 1024 - 8192

for beta-spectrums..... 1024 - 8192

### Basic relative error of activity determination

BDA-60 (r/n  $^{239}\text{Pu}$  of source 3P9) ..... <10%

BDB-60 (r/n  $^{90}\text{Sr}$ - $^{90}\text{Y}$  of source 3S0)..... <10%

### Range of total activity measurement

alpha-radiating radionuclides..... 0,05 – 400 Bq/kg

beta-radiating radionuclides..... 0,2 – 400 Bq/kg

### Sensitivity of radiometer to beta-radiation of radionuclides in reference to the sensitivity to beta-radiation of radionuclide $^{90}\text{Sr}$ + $^{90}\text{Y}$ in sources of ORIBI type

$^{90}\text{Sr}$  +  $^{90}\text{Y}$   $E_{\beta\text{max}} = 2200 \text{ keV}$ ..... 1

$^{14}\text{C}$   $E_{\beta\text{max}} = 156 \text{ keV}$ ..... no less than 0,01

$^{137}\text{Cs}$   $E_{\beta\text{max}} = 660 \text{ keV}$ ..... no less than 0,64

$^{60}\text{Co}$   $E_{\beta\text{max}} = 318 \text{ keV}$ ..... no less than 0,34

$^{204}\text{Tl}$   $E_{\beta\text{max}} = 763 \text{ keV}$ ..... no less than 0,70

### Software

“ASW”

## Overall dimensions, weight

№	Name of component part of radiometer RKBA-01 “RADEK”	Dimensions, mm	Weight, kg
1	Detection unit BDA-60	Ø 90x170	3,3
2	Detection unit BDB-60	Ø 90x170	3,3
3	Analog-digital converter (ADC) (analyzer) MD-198	55x155x180	0,5
4	Low-background chamber with passive shielding for BDA-60 unit	Ø 210x380	12
5	Low-background chamber with passive shielding for BDB-60 unit	Ø 210x380	50
6	Radiometer in assembly (without PC)	-	80

## The complete set

**The complete set “basic”:** radiometric detection units of alpha- and beta- radiation; low-background chambers with passive shielding for detection units; analog-digital converter MD-198; gasket of samples; set of measuring vessels; set of calibration sources; software – “ASW” program; passport, user manual; certified method of measurements (MVI); Certificate of Attestation of MVI; Pattern Approval Certificate of Measuring Instruments; Approved Sample Muster Certificate, issued by FSUE “VNIIM of D.I.Mendeleev”; modern personal computer IBM-PC; laser printer.

**Additionally you can order:** a system for automatization of registration and of marking of counting norms “Shtrih-3”; automated device of samples supply for alpha- and beta- tracts **APU-01 - Alpha; APU-01 - Beta.**