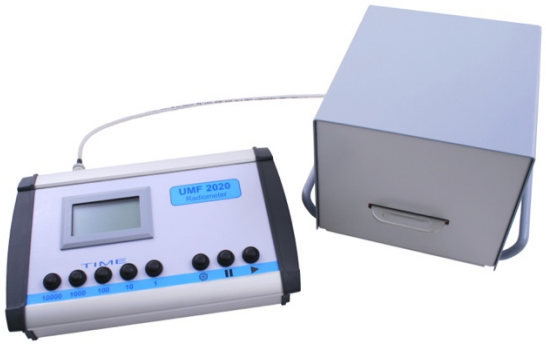
RADIOMETER OF GROSS ALPHA AND BETA ACTIVITY UMF-2020

Purpose



A radiometer is a stationery laboratory device that consists of a measurement console USR-06 and a detection device UDES-02. This is a counter of alpha- and beta-particles that fall on the detector from the sample located in the measuring cuvette.

A radiometer is aimed to measure:

- a total quantity of pulses from alpha-emitting radionuclides in the count samples;
- a total quantity of pulses from beta-emitting radionuclides in the count samples;
- a total quantity of pulses from external alpha- and beta-emitting of sources type 1С0, 1П9.

The radiometers also can use for measurements which make according to appropriate methods to determine:

- a total activity of beta-emitting nuclides in the count samples which obtained from the samples of food, soil, water, air filters and sorbents;
- an activity of radionuclides in the samples which obtained after selective radiochemical extraction;
- a total activity of alpha-emitting nuclides in “fat” and “thin” of the count samples of environment objects.

The radiometers apply as a a stationery laboratory measurement device in radiological control laboratories to measure of radionuclide activity in the studied samples if there are the appropriate measurement methods, certified under the established procedure.

Features

- two independent channels that provide simultaneous measurement of alpha and beta radiation of the sample;
- a measurement console provides an ability of continuous control for change of registered pulses in each of the channels according to the display and the operator can set the exposure time. Also, the console provides audible alarm of the completion of the measurement process;
- an access to the measurement data via a display and communication lines by interface RS-485.

Specifications

Type of detector	
- beta[1]- and alpha channel[2]:	- semiconductor detector
- compensation gamma-background	- Geiger–Müller counter
Measurement range	
- alpha-emitting radionuclides	from 0,01 to 10 000 Bq
- beta-emitting radionuclides	from 0,1 to 10 000 Bq
Energy range	
- alpha-radiation	3500 ÷ 8000 keV
- beta-radiation	50 ÷ 3500 keV
Limits of the main relative error	± 15 %
Sensitivity (semiconductor detector), no less	
- alpha-channel (^{239}Pu)	0,3 $s^{-1}\cdot Bq^{-1}$
- beta-channel (^{90}Sr+^{90}Y)	0,2 $s^{-1}\cdot Bq^{-1}$
Background pulse count rate in the registration channel	
- alpha-radiation, no more	0,001 s^{-1}
- beta-radiation, no more	0,03 s^{-1}
Range of set time intervals of measurements	
	from 1 to 99999 s
Minimum measured activity in the alpha channel (radionuclide Pu-239)	
	no more 0,02 Bq
Start time of radiometer, no more	
	30 minutes
A contribution to the beta channel account from the alpha channel for a thin alpha source does not exceed	
	1%
Run time of radiometers is not less	
	24 h
Power supply of radiometers is made from a direct current power supply with voltage	
	from 9 to 36 V
The power consumed by radiometers at natural radiation background and nominal supply voltage consists of the power consumption of the console and the detection device and does not exceed	

[1] For beta-sources with radionuclides ^{90}Sr+^{90}Y

[2] For alpha-sources with radionuclides ^{239}Pu

- a console USR-06	1,2 VA
- a detection device UDES-02	0,8 VA
Communication interface for connecting to upper-level equipment	
	RS-485
Ambient temperature range	from +5 °C to +50 °C
Dimensions	
- a console USR-06	295 x 185 x 80 mm
- a detection device UDES-02	244 x 240 x 175 mm
Weight	
- a console USR-06	1,3 kg
- a detection device UDES-02	34 kg

Delivery set: a console USR-06, a detection device UDES-02, a measuring cuvette (10 pcs), a clamping ring (for filters АФА-РСП-10), an operation manual, a data sheet.

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