MULTICHANNEL DOSIMETER-RADIOMETER MKS-2020

Purpose

A stationery multifunctional professional device is aimed to measure:

- ambient dose equivalent rate of gamma-radiation Ḣ*(10);
- ambient dose equivalent rate of neutron-radiation Ḣ*(10);
- flux density of thermal neutrons.

The dosimeter is intended for use at nuclear stations, plants of nuclear industry, nuclear fuel cycle enterprises, and also at the companies which use the sources of ionization radiation. It can be used as an independent device or a part of automated radiation monitoring system for operative and periodical control of radiation situation.

Console USR-05

BUS-04

Features

- a light three-coloured (green, yellow, red) and sound alarm about exceeding threshold which are viewed from the distance 20 m;
- an automatic identification of radiation detector connected to the measurement console;
- there is a possibility to set a sensitivity coefficients, dead time and thresholds (preliminary and alarm) in radiation detector by user;
- there is available of indication by console USR-05 and send to the upper level via communication line RS-485 with using exchange protocols Modbus RTU or DiBUS (at the Customer's choice) such information as: efficiency of radiation detectors, measurement results and cases of exceeding of setting threshold levels;

- there is a possibility of connection from 1 to 8 mono or different type radiation detectors from the dosimeter-radiometer;
- to provide a light-sound alarm at the installation place by means of block BUS-04 (if there is in the order);
- it is available to connect to personal computer and work with dosimeter-radiometer via software «TETRA_Checker», «TETRA_Reporter», «Atlant-Monitor»;
- storage of up to 10 000 measurement results in the non-volatile memory of the measurement console and there is available to send this data to a personal computer or to the systems of upper level;
- a protection degree against penetration of solid objects and water – IP67;
- a dosimeter-radiometer consists of a measurement console UIK-05 and radiation detectors (any type according to the supply agreement.). The Customer chooses the list of radiation detectors while making an order. The parameters and characteristics of the MKS-2020 dosimeter are determined by the respective parameters and characteristics of the radiation detectors that are part of the dosimeter;
- the radiation detectors of MKS-2020 has a technical ability to operate without measurement console UIK-05 in the automatic system of radiation control.

BDBG-310

BDKS-310

BDVG-310

BDMN-310

BDKN-310

SPECIFICATIONS[1]

Measurement range of ambient dose equivalent rate of gamma-radiation	
BDBG-310	from 0,04 μSv•h^{-1} to 30,0 Sv•h^{-1}
BDKS-310	from 0,01 μSv•h^{-1} to 30,0 Sv•h^{-1}
BDVG-310	from 0,01 μSv•h^{-1} to 100,0 μSv•h^{-1}
Measurement range of ambient dose equivalent rate of neutron-radiation	
BDMN-310 BDKN-310	from 0,1 μSv•h^{-1} to 0,1 Sv•h^{-1}
Measurement range of flux density of neutron radiation	
BDMN-310 BDKN-310	from 0,1 to 1•10^{5} s^{-1}·cm^{-2}
Energy range	
BDBG-310	from 50 keV to 3 MeV
BDKS-310	from 15 keV to 10 MeV
BDVG-310	from 50 keV to 3 MeV
BDMN-310[2]	from 0,025 eV to 14 MeV
BDKN-310	from 0,025 eV to 14 MeV

[1] The parameters and technical specifications MKS-2020 depend from the list of radiation detector(s) of MKS-2020 (at the Customer's choice).

[2] The radiation detector BDMN-310 and BDKN-310 without moderators measure the flux density of thermal neutrons in energy range from 0,025 eV.

Limits of tolerable intrinsic relative error, %	
BDBG-310	± (15 + 2/Ax)
BDKS-310	± (15 + 2/Ax)
BDVG-310	± (15 + 2/Ax)
BDMN-310	± (20 + 2/Ax)
BDKN-310	± (20 + 2/Ax)
Type of detector	
BDBG-310	a Geiger–Muller counter
BDKS-310	tissue equivalent scintillation detector (Ø 30 · 15 mm)
BDVG-310	scintillation detector (Ø 63 · 63 mm)
BDMN-310	scintillation detector of thermal neutrons (Ø 30 × 5 mm)
BDKN-310	neutron counter
Sensitivity, not less	
BDBG-310: ▪ sensitive subrange ▪ rough subrange	 4,0 $s^{-1}\cdot\mu Sv^{-1}\cdot h$
BDKS-310: ▪ sensitive subrange ▪ rough subrange	 4,0 $s^{-1}\cdot mSv^{-1}\cdot h$ 4,0 $s^{-1}\cdot\mu Sv^{-1}\cdot h$ 2,0 $s^{-1}\cdot mSv^{-1}\cdot h$
BDVG-310	2500,0 $s^{-1}\cdot\mu Sv^{-1}\cdot h$
BDMN-310 (in polyethylene moderator, sphere Ø 240 mm)	0,40 $s^{-1}\cdot\mu Sv^{-1}\cdot h$
BDKN-310 (in polyethylene moderator, cylinder Ø 100 mm)	1,0 $s^{-1}\cdot\mu Sv^{-1}\cdot h$
Energy dependence, %	
BDBG-310, BDKS-310	± 25 (calibration by ^{137}Cs)
BDVG-310	it is not standardized
BDMN-310	± 40 (calibration by Pu-⟨-Be) at the ionization radiation 1 keV – 14 MeV
Anisotropy of radiation detector, no more	
	± 20 %
Time of setting the operating mode	
	no more 10 minutes
Time of continuous work	
	no less 24 hours
Communication interface	
	RS-485
Power at rated supply voltage does not exceed	
console USR-05	15,0 VA
BDBG-310	0,30 VA
BDKS-310	0,75 VA
BDVG-310	0,30 VA
BDMN-310, BDKN-310	0,30 VA
BUS-04 in alarm mode	0,60 VA
Relative humidity (at 35°C)	
	up to 95 %
Atmospheric pressure	
	from 86 to 108 kPa
Protection class, not worse	
	IP67
Ambient temperature range	
BDBG-310, BDMN-310, BDKN-310 console USR-05, BDKS-310, BDVG-310 warning device BUS-04	from minus 40 to +60 °C from minus 20 to +40 °C from minus 20 to +30 °C
Dimensions and weight, no more	
USR-05	225·140·115 mm, 2,0 kg
BDBG-310	Ø 51x280 mm, 0,7 kg
BDKS-310	Ø 61x260 mm, 1,2 kg
BDVG-310	Ø 88 · 315 mm, 2,3 kg
BDMN-310	260·260·380 mm, 11,0 kg
BDKN-310	Ø 101·360 mm, 2,4 kg
BUS-04	180·90·90 mm, 0,8 kg

Delivery set: a measurement console USR-05, a radiation detector(s) (at the Customer's choice), a warning device BUS-04*, a junction box KK-2*, an operation manual, a service log.

Additional: software «TETRA_Checker», «TETRA_Reporter», «Atlant-Monitor» (if there is in the order).
* - if there is in the order.

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Devices of radiation and technological control