Radiation Detection and Measurement Solutions

DOZA

SUCCEEDING TOGETHER IN RADIATION PROTECTION OF PEOPLE, PROCESS AND ENVIRONMENT

Fast growing company

"Doza" is one of the leading research and production companies specialized in design, manufacture and supply of radiation monitoring solutions. We are also one of the biggest developers of methodologies and software in Russian Federation and neighboring countries.

Our company was founded in 1991 by a group of experts who came from the Center of ionizing radiation "VNIIFTRI" based in Moscow region. 20 years later our sales reached $30 mln (2015). At least 5% of annual sales are re-invested in R&D.

Our customers are essentially NPPs, fuel cycle companies, National Nuclear authorities, Emercom, Ministry of Health, Ministry of Defense, Ministry of the Interior, Federal Customs Service, national transport organizations and standardization authorities, research centers and laboratories, medical complexes, environmental organizations, etc.

Prior to the delivery of our equipment to the end-users, it passes through a sophisticated test system and function analysis. Most of our devices and equipment are supplied with the calibration procedures, which are adapted in compliance with the relevant normative documents. After-sales service and maintenance are ensured by our service center. We also organize trainings, provide day-to-day customer service, realize on-site servicing (assistance, mounting, installation, commissioning, maintenance) and make available a hot-line.

Manufacture and production capacities

New sophisticated machines and equipment ensure large production volume. Our own technology and highly skilled staff are key factors that allow us to guarantee the highest quality of offered products.

We use high technology laser metal sawing machines, powerful robotic processing equipment, automated machine for board surface mount and others. Few years ago "Doza" built up a new production building (1300 m^2). Currently we have totally 2000 m^2 of production facilities and other 2000 m^2 are used for office and warehouse. Now a new production and office building (13100 m^2) is under construction.

Our product portfolio

Our high scientific potential, extremely talanted R&D and high adaptability to customer specs and markets needs allow us to supply reliable and cost-effective solutions which meet all requirements of domestic and international (IEC, ISO) standards. Our key product lines are portable dosimeters and radiometers, spectrometers, radiation monitoring systems, environmental surveillance stations, critical accident alarm systems, medical equipment, calibration equipment. Spare parts policy: we commit to provide spare parts for our devices as soon as it is required by our customers.

Business development

We are actually selling more than 200 different products in 50 countries. We constantly increase our business volume in BRICS countries and other newly developed regional powers. We move fast forward in getting new customers in Europe, South America, Asia and Middle East. Our key target is to develop our business through new partnership all over the world. Any new partner is very welcome.

ANRI magazine

We have been releasing "The ANRI Journal" (Radiation monitoring equipment and news) since 1994. We issue the most relevant research materials, reports and articles dedicated to Health Physics, radiation problematic, methodology, metrology and new equipment. This Journal is referenced in Russian Federal Agency on Press and Mass Communication catalogue. "The ANRI" is the exclusive periodical Russian journal focused on practical aspects of radiation monitoring. It is also referenced in Chemical Abstracts.

Quality management system

"Doza" quality management system meets GOST ISO 9001-2015 requirements and is a base of corporate management system. The Quality Control Chart is the main company document that determines the principles of business, operation and permanent improvement of the quality management system according to the principles and requirements of international standards.

Metrological service

"Doza" has a developed metrological service based on the standards for dosimeters and radiometers calibration and verification; pulse and static X-ray machines complying with ISO 4037; reference X-ray dosimeter; air flow volume calibration machine; radioactive gases radiometer calibration standard; gamma-sources: Cs-137, Co-60, Co-57, Am-241, neutron Pu-Be sources, alpha- and beta-sources, and spectrometric sources. Our metrological service is one of the best equipped laboratories in Russia. It is accredited to perform primary and periodical verification and calibration. More than 30000 verifications per year are done in our laboratory.

Our staff

Over 250 people including 12 Ph.D and 85 engineers represent the most valuable capital of "Doza".

Seven employees of our company were awarded for their participation in elimination of the Chernobyl accident consequences. Our experts participate in development and implementation of normative and methodological documents which make the basis of radiation safety in Russia.

Among our specialists there are experts of:

- Scientific and Technical Board of the State Atomic Energy Corporation "Rosatom"
- Technical committee 45 IEC "Nuclear instrumentation"
- Technical committee of 413 Rosstandart
- Coordination Council of the "Rosatom" on the development of the environmental radiation monitoring system (ERMS)
- Working group of the "Rosatom" on developing the "Integrated complex safety management system in the field of Nuclear Power"
- Association of Medical Physicists of Russia (AMPR).

Training

Since 1994 "Doza" has been organizing different types of training. Best specialists from national and international research centers come to "Doza". We provide our trainees with up-to-date methodological and standard / norms documents. In order to create an independent educational entity, "Doza" founded Educational and Methodological Center "Monitoring and Safety" in 2007. This Center is functioning under the License of the Moscow Department of Education.

Some references

20 NPPs use our equipment, including Kudankulam NPP in India, Tianwan NPP in China. More than 1000 medical institutions are our customers. The biggest Ice-breaker in the world is equipped with our RMS. Within 2013-2014 we have successfully supplied 450 measuring channels to the large Mining and Chemical Complex.

Radiation Monitoring System

“PELIKAN”

RADIATION MONITORING SYSTEM (RMS)

More than 100 Radiation Monitoring Systems “Pelikan” are installed and operating successfully at facilities representing different industries, including research reactors, nuclear power plants and the icebreaker “50 Let Pobedy”.

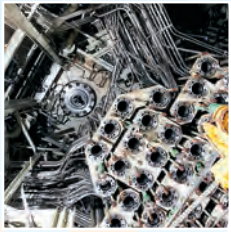
Features

The RMS “Pelikan” consists of a complex of independent units (intended for measurement of different parameters) that are interconnected into integrated information network. The RMS network is built using Ethernet IEEE 802.3 technology, it unites measurement devices and workstations as clients. The network includes two servers (main and hot standby), or alternatively, it can have no server at all. The RMS allows to perform all commutations necessary for repair or calibration of measurement units in hot mode, without interrupting normal network operation.

REFERENCE

The major users of "Pelikan" RMS system are Nuclear Power Plants in Russia, Ukraine, China and India, as well as Rosatom, Rospotrebnadzor, Ministry of Emergency Situations, Rosstandard, Ministry of Health, Ministry of Defense, Russian Railways, laboratories and other companies and organizations.

- Shipyard "Zvesdochka", Severodvinsk
- Mining and Chemical Complex, Zheleznogorsk
- Institute of Physics and Power Engineering, Obninsk
- Russian Research Institute of Technical Physics, Sarov
- Leningrad NPP
- «Atomflot»
- "Zvesda" factory, Bol'shoy Kamen'
- Petersburg Nuclear Physics Institute
- Civil Security Department, Moscow
- "Rosatom" Corporation, MosNPO "Radon"
- "Rosatom" Corporation, "SNIIP-Systematom"
- "Rosenergoatom" Concern, Moscow
- Norilsk Mining and Smelting producer
- Russian Research Institute "VNII Avtomatika", Moscow
- Kudankulam NPP, India
- Tianwan NPP, China



RADIATION MONITORING SYSTEM

Ethernet / RS-485

Ethernet / RS-485

DBG-S11D: Wide range gamma area monitor

BDMG-101: High range gamma area monitor

UDMN-100: Neutron area monitor

UDKG-100: Wel Liquid gamma monitor

BOP-1M: Data processing and transmission unit

BDMG-A02D: High range gamma area monitor

"Impuls" External Display Unit

BAS/BAS-1s: External alarm

BI-2: Remote display & alarm unit

UDG-03D: Noble gas monitor

RMS workstation

Server

RMS workstation

Ethernet / RS-485

Ethernet / RS-485

RM Rack

UDA-1AB: Particulate monitor

UPPVM: Air flow parameters monitor

UDI-1B: Iodine monitor

Ethernet switch

SKGAV: Stack monitor

UDG-1B: Noble gas monitor

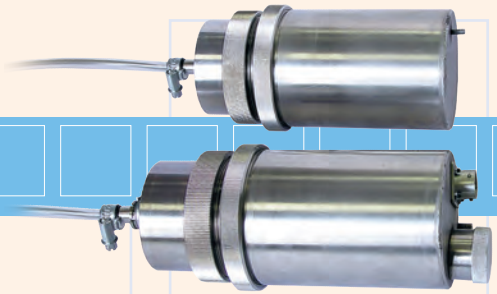
UDGP-01: Liquid/technological environment monitor

UDGP-01: Steam generator leakage monitor

UDGB-01: Noble gases/H-3/C-14 monitor

BDMG-101

HIGH RANGE GAMMA AREA MONITOR



- Continuous automatic monitoring of the ambient dose equivalent rate.
- High temperature range (up to 120 °C).

BOP-1M

Physical characteristics

- Detector – ionization chambers MIC

Measurement range:

- MIC-1: $5 \cdot 10^{-5} \div 200$ Sv/h
- MIC-2: $5 \cdot 10^{-4} \div 1000$ Sv/h
- MIC-3: $1 \cdot 10^{-5} \div 100$ Gy/h
- MIC-4: $5 \cdot 10^{-3} \div 10000$ Gy/h

Energy range:

- 0.05 ÷ 3.0 MeV

temperature range:

- ionization chamber module MIC-1: −30 ÷ +120 °C
- ionization chamber modules MIC-2, MIC-3, MIC-4, electrometric module ME: −30 ÷ +60 °C

Electrical characteristics

- interfaces: RS-485
- cable length between MIC and ME: up to 30 m

Mechanical characteristics

- Protection index: IP65

Overall dimensions, weight:

- ME: Ø 105×293 mm, 2.3 kg
- MIC-1: Ø 85×206 mm, 1.2 kg
- MIC-2: Ø 45×156 mm, 0.3 kg
- MIC-3: Ø 136×226 mm, 0.9 kg
- MIC-4: Ø 35×92 mm, 0.2 kg

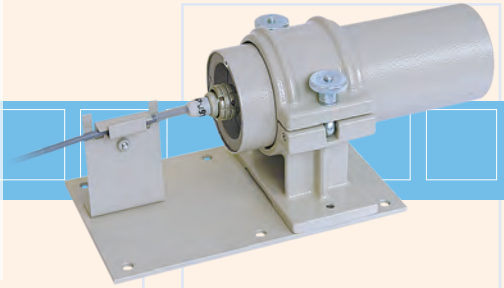
Versions:

- Stainless steel 100 cm^2 ionization chamber module (MIC-1) and electrometric module (ME)
- Stainless steel 20 cm^2 ionization chamber module (MIC-2) and electrometric module (ME)
- Duralumin 500 cm^2 ionization chamber module (MIC-3) and electrometric module (ME)
- Titanium 2 cm^2 ionization chamber module (MIC-4) and electrometric module (ME)

Reference standards: *Nuclear: IEC 60532*

DBG-S11D

WIDE RANGE GAMMA AREA MONITOR



Continuous automatic monitoring of the ambient dose equivalent rate

DBG-S11D monitors come in three versions, that differ by measurement range and overall dimensions

BOP-1M

Physical characteristics

- Detector – GM counters

Measurement range:

- DBG-S11D (basic version): 0.1 μSv/h ÷ 10 mSv/h
- DBG-S11D (version 01): 0.1 μSv/h ÷ 10 Sv/h
- DBG-S11D (version 02): 0.1 μSv/h ÷ 100 Sv/h

Energy range:

- 0.05 ÷ 3.0 MeV

Temperature range:

- −60 ÷ +80 °C

Electrical characteristics

- Interfaces: RS-485, USB

Mechanical characteristics

- Protection index: IP68
- Paint: decontaminable

Overall dimensions, weight:

- DBG-S11D (basic version): Ø68×141 mm, 0.65 kg
- DBG-S11D (version 01): Ø68×179 mm, 0.7 kg
- DBG-S11D (version 02): Ø68×179 mm, 0.7 kg
- Wall mount: 200×122×117 mm, 2.24 kg

Rack with DBG-S11D and BOP-1MD

Reference standards: *Nuclear: IEC 60532*

BDMG-A02D

HIGH RANGE GAMMA AREA MONITOR FOR ACCIDENT AND POST-ACCIDENT CONDITIONS

- Continuous automatic monitoring of the absorbed dose rate
- Monitoring inside containment
- The detector is delivered in assembly with a communication line
- Communication line includes inter wall protective tube
- Hermetic communication line is filled with dry nitrogen

Physical characteristics

- Detector - stainless steel ionization chamber

Measurement range:

- $5 \cdot 10^{-4} \div 1.0 \cdot 10^{5}$ Gy/h

Energy range:

- 0.05 ÷ 7.12 MeV

Temperature range:

- Detector: +20 ÷ +350 °C continuous
- Electrometric module: –10 ÷ +50 °C

Detector operating pressure:

- 1.0 MPa

Electrical characteristics

- Interfaces: RS-485
- Detector-electrometric module cable length: up to 150 m
- Programmable relay output (SPDT relay)
- Analog output 4-20 mA (optional)

Mechanical characteristics

Protection index:

- Detector - IP67
- Electrometric module - IP65
- Paint: stainless steel

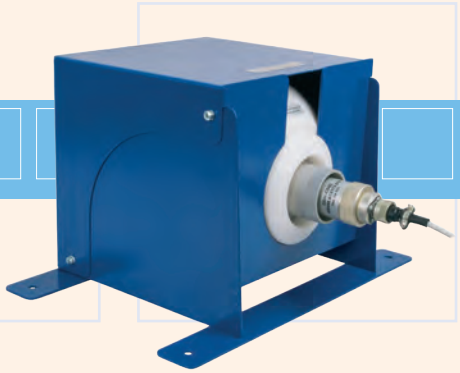
Overall dimensions, weight:

- Detecting unit: 240×135×115 mm, 5 kg
- Electrometric module: 620×220×770 mm, 60 kg

Reference standards: *Nuclear: IEC 60951, EMC: IEC 61010, IEC 61000-6-2, Seismic: IEC 60980*

UDMN-100

NEUTRON AREA MONITOR



Continuous automatic monitoring of the neutron-radiations ambient dose equivalent rate.

- Spherical polyethylene moderator Ø 239 mm

Physical characteristics

- Detector – scintillator ZnS(Ag), Li-6

Measurement range:

- 0.1 μSv/h ÷ 0.1 Sv/h

Energy range:

- 0.025 eV ÷ 10.0 MeV

Temperature range:

- −45 ÷ +50 °C

Electrical characteristics

- Interfaces: RS-485

Reference standards: *Nuclear: IEC 61322*

Mechanical characteristics

- Protection index: IP65
- Paint: decontaminable

Overall dimensions, weight:

- BDMN-100: 254×256×320 mm, 11.3 kg
- Interface unit BS-12: 176×80×64 mm, 0.8 kg

UDKG-100

WEL LIQUID GAMMA MONITOR

Continuous automatic monitoring of the gamma radiation flux. Operation in the rocks, ore, liquid media and sludge.

Physical characteristics

- Detector – scintillator NaI (Tl) Ø 18x30 mm

Measurement range:

- 40 ÷ $8 \cdot 10^4$ $s^{-1} \cdot cm^{-2}$

Energy range:

- 0.1÷ 3.0 MeV

Temperature range:

- −40 ÷ +50 °C

Electrical characteristics

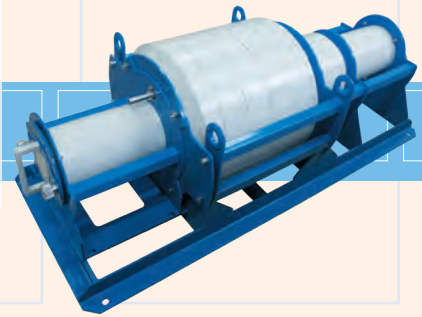
- Interfaces: RS-485

Mechanical characteristics

- Protection index:
  - BDKG-100: IP68
  - Interface block BS-16: IP65
- Paint: stainless steel
- Overall dimensions, weight:
  - Detector unit BDKG-100: Ø 38×530 mm, 3 kg
  - Interface block BS-16: 176×80×64, 0.7 kg

UDGP-01

LIQUID / TECHNOLOGICAL ENVIRONMENTS MONITOR



UDGP-01 monitor is intended for the continuous measurement of volumetric activity of gamma-emitting nuclides including N-16 in the process media: liquids, vapours and pulps, at nuclear power plants and nuclear facilities

- On line transfer of gamma spectrometry data

Physical characteristics

- Detector – scintillator CsI, NaI

Measurement range:

- Gamma-activity: $1.5 \cdot 10^3 \div 3.0 \cdot 10^8$ Bq/m^3

Energy range:

- Gamma: 0.05 ÷ 1.5 MeV

Temperature range:

- −10 ÷ +80 °C

BOP-1SP

Electrical characteristics

- Interfaces: RS-232, RS-485, Ethernet
- Programmable relay output (SPDT relay)

Mechanical characteristics

- Protection index: IP65
- Paint: decontaminable

Overall dimensions, weight:

- Detector unit:
  - CsI Ø 60×360 mm,1.4 kg
  - NaI Ø 35×750 mm, 2.6 kg
- Data processing and transmission unit BOP-1sp: 280×220×114mm, 4.3 kg

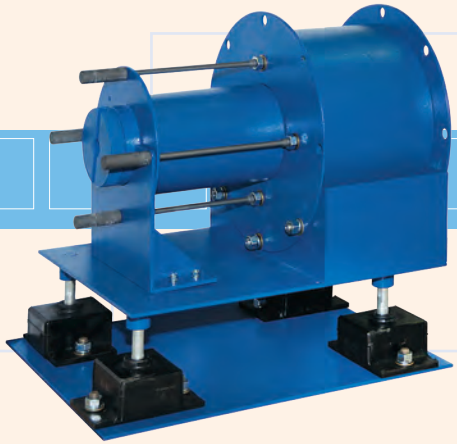
Alarm:

- Sound alarm: 80 ÷ 100 dBA at distance 1 m
- Visual alarm: green, yellow, red
- Connection of the external alarm unit of "BAS" type

Reference standards: *Nuclear: IEC 60768, EMC: IEC 61010, IEC 61000-6-2, Seismic: IEC 60980*

UDGP-01

STEAM GENERATOR LEAKAGE MONITOR



Continuous automatic monitoring of steam generator primary to secondary leakage.

- On line transfer of gamma spectrometry data
- N-16 monitoring
- Self-test performance using Am-241 check source implanted into the detector
- Audible and visual alarms on exceeding preset thresholds of the RMS equipment

Physical characteristics

- Detector – scintillator CsI Ø 40x100 mm

Measurement range:

- High energy gamma-activity (N-16): $1.5 \cdot 10^3 \div 3.0 \cdot 10^8$ Bq/m^3
- General gamma-activity: $1.0 \cdot 10^4 \div 2.0 \cdot 10^8$ Bq/m^3

Energy range:

- General gamma: 0.05 ÷ 1.5 MeV
- In integral spectral band of energy: 5000 ÷ 7200 keV
- Temperature range: –10 ÷ +80 °C

Electrical characteristics

- Power supply: 85 ÷ 260 V, 47 ÷ 440 Hz
- Interfaces: RS-232, RS-485, Ethernet
- Programmable relay output (SPDT relay)

Mechanical characteristics

- Protection index: IP 65
- Paint: decontaminable

Overall dimensions, weight:

- Detector unit: Ø 60×360 mm,1.7 kg
- Data processing and transmission unit BOP-1sp: 298×220×114mm, 4.3 kg
- Collimator: Ø 350×455 mm, 150 kg

Alarm:

- Sound alarm: 80 ÷ 100 dBA at distance 1 m
- Visual alarm: green, yellow, red
- Connection of the external alarm unit of "BAS" type

BOP-1SP

Reference standards: *Nuclear: IEC 60768, EMC: IEC 61010, IEC 61000-6-2, Seismic: IEC 60980*

UDA-1AB

PARTICULATE MONITOR

Stationary version

Continuous automatic monitoring of the alpha- and beta-radioactive aerosol concentration in the working air and in the air in ventilation ducts and stacks.

- Radon, toron progenies and gamma background compensation
- On line alpha spectrometry
- Audible and visual alarms on exceeding preset thresholds of the RMS equipment
- Control of electromagnetic valves when operating with the external air sampling line
- Control of a pump unit
- Periodic calibration by means of standard beta- and alpha-sources

Physical characteristics

- Silicon specrometric detectors (2 pcs: for measurement and for background compensation)
- Filter tape types: LFAS, FSLW
- Tape consumption (when continuous operation): 10 m/50 days
- Air flow rate: 5 ÷ 60 l/min
- Operation temperature range: –10 ÷ +50 °C

Measurement range:

- Alpha: $10^{-2} \div 2 \cdot 10^{5}$ Bq/m^3
- Beta: $10^{-1} \div 10^{7}$ Bq/m^3

Energy range:

- Alpha: 3.0 ÷ 9.0 MeV
- Beta: 0.05 ÷ 3.0 MeV

Electrical characteristics

- Power supply: 85 ÷ 260 V, 47 ÷ 440 Hz
- Interfaces: RS-232, 2×RS-485, Ethernet
- Programmable relay output (SPDT relay)
- Analog output 4-20 mA (optional)

Mechanical characteristics

- Protection index: IP65
- Paint: decontaminable

Overall dimensions, weight:

- Stationary version: 389×260×304 mm, 15.6 kg
- Mobile version with the pump unit BN-01: 389×468×950 mm, 38.4 kg

Alarm:

- Sound alarm: 80 ÷ 100 dBA at distance 1 m
- Visual alarm: green, yellow, red
- Connection of the external alarm unit "BAS" type

Versions:

- Stationary version
- Stationary version with the pump unit BN-01
- Mobile version with the pump unit BN-01

Mobile version with the pump unit BN-01

Reference standards: *Nuclear: IEC 60761, IEC 61172, EMC: IEC 61010, IEC 61000-6-2, Seismic: IEC 60980*

UDG-1B

NOBLE GAS MONITOR

Stationary version

Continuous automatic monitoring of the beta-emitting radioactive gases concentration in the working air and in the air in ventilation ducts and stacks.

- Gamma background compensation
- Audible and visual alarms on exceeding preset thresholds of the RMS equipment
- Periodic calibration by means of a standard beta-source

Versions:

- Stationary version
- Stationary version with the pump unit BN-01
- Mobile version with the pump unit BN-01

Physical characteristics

- Silicon detectors (2 pcs: for measurement and for background compensation)
- Air flow rate: not less than 10 l/min
- Operation temperature range: –10 ÷ +50 °C

Measurement range:

- $10^4 \div 6 \cdot 10^9$ Bq/m^3

Energy range:

- 0.08 ÷ 3.0 MeV

Electrical characteristics

- Power supply: 85 ÷ 260 V, 47 ÷ 440 Hz
- Interfaces: RS-232, 2×RS-485, Ethernet
- Programmable relay output (SPDT relay)
- Analog output 4-20 mA (optional)

Mechanical characteristics

- Protection index: IP65
- Paint: decontaminable

Overall dimensions, weight:

- Stationary version: 395×240×304 mm, 29.5 kg
- Mobile version with the pump unit BN-01: 395×468×950 mm, 54.3 kg

Alarm:

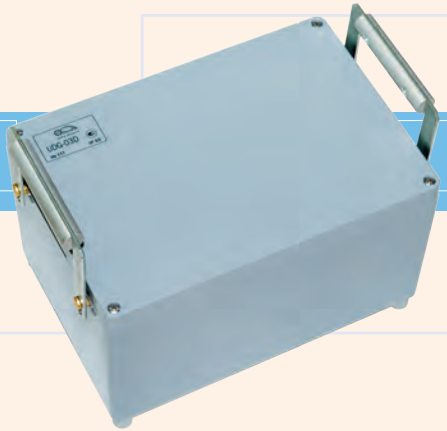
- Sound alarm: 80 ÷ 100 dBA at distance 1 m
- Visual alarm: green, yellow, red
- Connection of the external alarm unit "BAS" type

Mobile version with the pump unit BN-01

Reference standards: *Nuclear: IEC 60761, IEC 62302, EMC: IEC 61010, IEC 61000-6-2, Seismic: IEC 60980*

UDG-03D

NOBLE GAS MONITOR



UDG-03D monitor is recommended to use in gas-aerosol control systems at nuclear power and fuel cycle facilities. Measurement of volumetric activity of beta-emitting radioactive gases (argon, krypton, xenon), adapted to the measurement of the rapidly changing volume activity in various technological processes.

- Gamma background compensation
- Periodic calibration by means of a standard beta-source

Physical characteristics

- Silicon detector, 2 pcs (for measurement and for background compensation)
- Air flow rate: not less than 10 l/min
- Operation temperature range: –10 ÷ +55 °C

Measurement range:

- $10^4 \div 3.7 \cdot 10^{10}$ Bq/m^3

Energy range:

- 0.06 ÷ 3.0 MeV

Electrical characteristics

- Power supply: 12.0 V
- Interface: RS-485

Mechanical characteristics

- Protection index IP65
- Paint decontaminable

Overall dimensions, weight:

- 354×230×203 mm, 23.2 kg

Reference standards: *Nuclear: IEC 60761, IEC 62302, EMC: IEC 61010, IEC 61000-6-2, Seismic: IEC 60980*

UDI-1B
IODINE MONITOR

Continuous automatic monitoring of radioiodine concentration in the air at working places and in ventilation ducts and stacks.

- Measurement of volumetric activity of radionuclides I-131, I-132, I-133, I-135 in the air
- On line gamma spectrometry
- Gamma background compensation
- Performance self-test by means of Am-241 check source implanted into the detector
- Audible and visual alarm signals of the excess of preset thresholds
- Periodic calibration by means of standard source

Physical characteristics

- Scintillation detectors CsI(Tl) (2 pcs: for measurement and for background compensation)
- Cartridge: activated charcoal

Measurement range:

- 3.7 ÷ 3.7·10^6 Bq/m^3

Energy range:

- 0.06 ÷ 3.0 MeV
- Air flow rate: 15 ÷ 40 l/min
- Operation temperature range: –10 ÷ +55 ºC

Electrical characteristics

- Power supply: 85 ÷ 260 V, 47 ÷ 440 Hz
- Interfaces: RS-232, 2×RS-485, Ethernet
- Programmable relay output (SPDT relay)
- Analog output 4-20 mA (optional)

Mechanical characteristics

- Protection index: IP65
- Paint: decontaminable

Overall dimensions, weight:

- Stationary version: 437×307×474 mm, 29.5 kg
- Mobile version with the pump unit BN-01: 472×395×975 mm, 51.6 kg

Alarm:

- Sound alarm: 80 ÷ 100 dBA at distance 1 m
- Visual alarm: green, yellow, red
- Connection of the external alarm unit of "BAS" type

Versions:

- Stationary version
- Stationary version with the pump unit BN-01
- Mobile version with the pump unit BN-01

Mobile version with the pump unit BN-01

Reference standards: *Nuclear: IEC 60761, IEC 61171; EMC: IEC 61010, IEC 61000-6-2; Seismic: IEC 60980*

UDGB-01

NOBLE GASES/H-3/C-14 MONITOR

Continuous automatic monitoring of the beta-emitting radioactive gases, including tritium and carbon-14 concentration in the air at working places and in ventilation ducts and stacks.

- Audible and visual alarms on exceeding preset thresholds of the RMS equipment
- Monitoring of the noble gase activity in gaseous effluents and ventilation air for accident and post-accident conditions

Versions:

- UDGB-01T – with built-in ionization chamber 10.0 liters
- UDGB-01T2 – with built-in ionization chamber 0.1 liter
- UDGB-01T1 – with remote ionization chamber 10.0 liters

Physical characteristics

- Detectors – stainless steel ionization chambers
- Air flow rate: not less than 10 l/min
- Operation temperature range: –10 ÷ +50 °C

Volumes of ionization chambers:

- UDGB-01T, UDGB-01T1: 10.0 liters
- UDGB-01T2: 0.1 liter

Measurement range (except Tritium):

- UDGB-01T, UDGB-01T1: $1.0 \cdot 10^4 \div 5.0 \cdot 10^9$ Bq/m³
- UDGB-01T2: $10^9 \div 3.7 \cdot 10^{15}$ Bq/m³

Measurement range (Tritium):

- UDGB-01T, UDGB-01T1: $5.0 \cdot 10^4 \div 5.0 \cdot 10^9$ Bq/m³
- UDGB-01T2: $5.0 \cdot 10^9 \div 5.0 \cdot 10^{14}$ Bq/m³

Electrical characteristics

- Power supply: 85 ÷ 260 V, 47 ÷ 440 Hz
- Interfaces: RS-232, 2×RS-485, Ethernet
- Programmable relay output (SPDT relay)
- Analog output 4-20 mA (optional)

Mechanical characteristics

- Protection index:
  - UDGB-01T and UDGB-01T2 - IP65
  - UDGB-01T1 - IP23
- Paint: decontaminable

Overall dimensions, weight:

- UDGB-01T: 381×343×716 mm, 30 kg
- UDGB-01T1: 269×315×173 mm, 12.5 kg
- Ionization chamber 10.0 liters: 262×600×240 mm, 14.5 kg
- UDGB-01T2: 381×343×716 mm, 27 kg

Alarm:

- Sound alarm: 80 ÷ 100 dBA at distance 1 m
- Visual alarm: green, yellow, red
- Connection of the external alarm unit "BAS" type

UDGB-01T1

Ionization chambe 10 liters

Reference standards: *Nuclear: IEC 60761, IEC 60710, IEC 60951-2 ; EMC: IEC 61010, IEC 61000-6-2; Seismic: IEC 60980*

BOP-1M

DATA PROCESSING AND TRANSMISSION UNIT

- Processing of data incoming from detecting units DBG-S11D, UDMN-100, UDKG-100, BDMG-101, BDRG-52, UDG-03D, contamination radiometer RZBA-04-04M
- Data transmission to the network
- Data transmission to the mobile computer
- Storage of thresholds values and parameters of detecting blocks
- Power supply and diagnostics of detecting units
- Generation of the alarm signals of the excess of preset thresholds
- Data backup in the non-volatile memory
- Display of measured values on external display devices or on the integrated display (BOP-1MD)

Physical characteristics

- Quantity of joined detecting blocks and alarm units – up to 20
- Temperature range: –40 ÷ +50 °C

Electrical characteristics

- Power supply: 85 ÷ 260 V, 47 ÷ 440 Hz
- Interfaces: RS-232, RS-485, Ethernet
- programmable relay output (SPDT relay)

Mechanical characteristics

- Protection index: IP65
- Paint: decontaminable

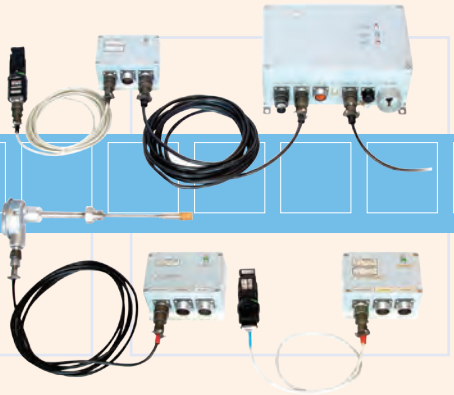
Overall dimensions, weight:

- 298×220×114 mm, 5 kg

Reference standards: *EMC: IEC 61010, IEC 61000-6-2, Seismic: IEC 60980*

UPPVM

AIR FLOW PARAMETERS MONITOR



The UUPVM monitor is intended to use in gas monitoring stacks to enable continuous monitoring of the flow rate, temperature and humidity of the gas flow

Physical characteristics

Measurement range:

- Air flow velocity: 1 ÷ 20 m/s
- Air temperature: 0 ÷ +80 °C
- Air humidity: 10 ÷ 95 %

Electrical characteristics

- Power supply: 220 V, 50 Hz
- Interfaces: RS-232, Ethernet/RS-485

Mechanical characteristics

Protection index:

- BSPP-1st, BSPP-1tv, BOP-1s: IP65
- PP-st, IPTV: IP54
- Paint: decontaminable

Overall dimensions, weight:

- Air velocity probe PP-st: 60×38×136 mm, 0.15 kg
- Interface block BSPP-1st: 125×155×73 mm, 0.7 kg
- Air temperature and relative humidity probe IPTV-056-A: 333×100×60 mm, 0.7 kg
- Interface block BSPP-1tv: 125×155×73 mm, 0.7 kg
- Data processing and transmission unit BOP-1s: 280×233×111 mm, 8 kg

BOP-1S

Reference standards: *Nuclear: ISO 2889, EMC: IEC 61010, IEC 61000-6-2, Seismic: IEC 60980*

"IMPULS"

EXTERNAL DISPLAY UNIT

External display unit "Impuls-910-R"

Display of data received from RMS monitors

Physical characteristics

Length of communication cable:

- Up to 1200 m

Character height:

- "Impuls-910-R": 100 mm
- "Impuls-915-D4S": 150 mm
- "Impuls-927-D4S": 270 mm

Operating temperature range

- "Impuls-910-R": 0 ÷ +50 °C
- "Impuls-915-D4S", "-927-D4S": –40 ÷ +50 °C

Electrical characteristics

- Power supply: 220 V, 50 Hz

Mechanical characteristics

Protection index:

- "Impuls-910-R: IP44
- "Impuls-915-D4S", "-927-D4S": IP65

Overall dimensions, weight:

- "Impuls-910-R": 400×160×65 mm, 3 kg
- "Impuls-915-D4S": 850×250×75 mm, 5 kg
- "Impuls-927-D4S": 1250×330×75 mm, 5 kg

Reference standards: *EMC: IEC 61010, IEC 61000-6-2, Seismic: IEC 60980*

BI-2

REMOTE DISPLAY & ALARM UNIT

- Display of data received from RMS monitors
- Audible and visual alarms on exceeding preset thresholds of the RMS equipment
- Individual threshold setting for each measurement channel
- Audible alarm: 70 ÷ 100 dB at a distance of 1 m
- Visual alarm: red, yellow, green

Physical characteristics:

Length of communication cable:

- Up to 1200 m

Displayed page size:

- 4 lines of 20 characters

Volume of loaded information:

- 10 pages

Change of pages:

- Programmed or by pressing a button

Operating temperature range

- −40 ÷ +50 °C

Electrical characteristics:

- Power supply: 9 ÷ 18 VDC
- Interfaces: RS-485

Mechanical characteristics:

- Protection index: IP65
- Overall dimensions, weight: 222×164×73 mm, 4.0 kg

Reference standards: *EMC: IEC 61010, IEC 61000-6-2, Seismic: IEC 60980*

BAS/BAS-1S
EXTERNAL ALARM

Generation of audible and visual signals on exceeding preset thresholds of the RMS equipment

- Audible alarm: 70 ÷ 100 dBA at distance 1 m
- Visual alarm: green, yellow, red

Distance from RMS monitor:

- BAS: up to 20 m
- BAS-1s: up to 1200 m

Power supply:

- 220 V, 50 Hz

Overall dimensions, weight:

- BAS: 145×108×466 mm, 1.85 kg
- BAS-1s: 108×160×472 mm, 1.85 kg

Reference standards: *EMC: IEC 61010, IEC 61000-6-2, Seismic: IEC 60980*

SKGAV

STACK MONITOR

Continuous monitoring of radioactivity in gaseous effluents

- Automatic monitoring of the alpha- and beta-radioactive aerosol, noble gas and radioiodine concentrations in the air in ventilation ducts and stacks
- Monitoring of the flow rate, temperature and humidity of the gas flow
- Separation of gaseous effluent into targeted fractions by means of a two-stage filter
- Reversion of gas after analysis to the ventilation system

Particulate, noble gas and iodine monitors rack

Physical characteristics

Particulate (UDA-1AB):

- Silicon specrometric detectors (2 pcs: for measurement and for gamma-background compensation)
- Filter tape types: LFAS, FSLW
- Tape consumption (when continuous operation): 10 m/50 days

Measurement range:

- Alpha: $10^{-2} \div 2 \cdot 10^{5}$ Bq/m^3
- Beta: $10^{-1} \div 10^{6}$ Bq/m^3

Energy range:

- Alpha: 3.0 ÷ 9.0 MeV
- Beta: 0.05 ÷ 3.0 MeV

Noble gas (UDG-1B):

- Silicon detectors (2 pcs: for measurement and for gamma-background compensation)

Measurement range:

- $10^{4} \div 6 \cdot 10^{9}$ Bq/m^3

Energy range:

- 0.08 ÷ 3.0 MeV

Iodine (UDI-1B):

- Scintillation detectors CsI(Tl) (2 pcs: for measurement and for background compensation)

Measurement range:

- $3.7 \div 3.7 \cdot 10^{6}$ Bq/m^3

Energy range:

- 0.06 ÷ 3.0 MeV

Air flow parameters (UPPVM):

Measurement range:

- Air flow velocity: 1 ÷ 20 m/s
- Air temperature: 0 ÷ +80 °C
- Air humidity: 10 ÷ 95 %

Related monitors and equipments:

- UDA-1AB: particulate monitor
- UDG-1B: noble gas monitor
- UDI-1B: iodine monitor
- UPPVM: air flow parameters monitor
- Sampling and sample separation rack

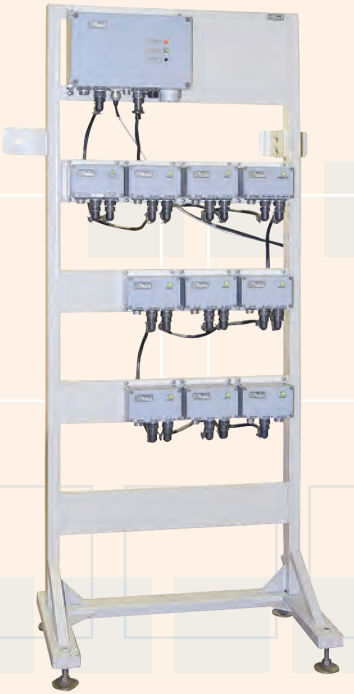
Electrical characteristics:

- Power supply: 220 V, 50 Hz
- Interfaces: RS-232, RS-485, Ethernet
- Programmable relay output (SPDT relay)

Alarm:

- Sound alarm: 80 ÷ 100 dBA at distance 1 m
- Visual alarm: green, yellow, red
- Connection of the external alarm unit "BAS" type

Sampling and sample separation rack



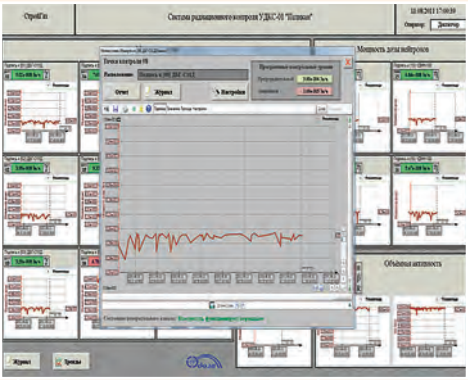
Air flow parameters monitor rack

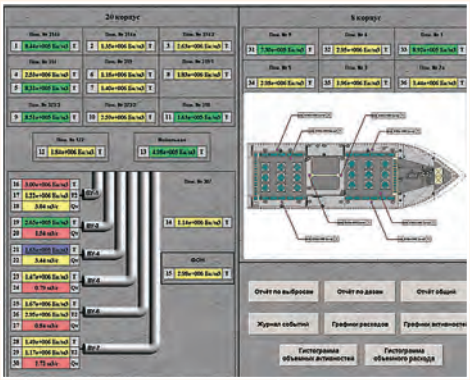
Reference standards: *Nuclear: IEC 60761, IEC 61171, IEC 61172, IEC 62302, ISO 2889, EMC: IEC 61010, IEC 61000-6-2, Seismic: IEC 60980*

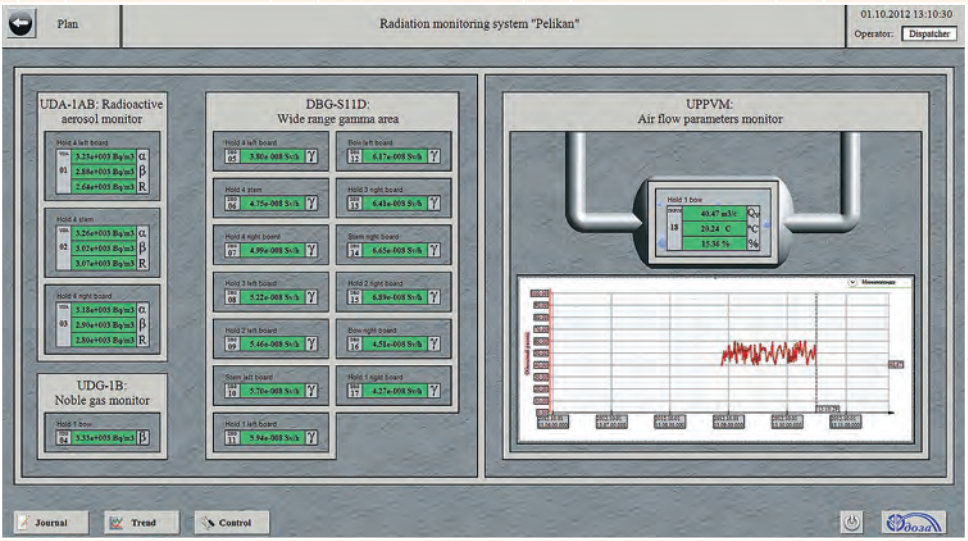
RMS SOFTWARE

Data acquisition, storing and visual representation of RMS monitors measurement results.

- Ethernet IEEE 802.3 network
- Client/server architecture
- TCP/IP protocol
- Oracle based Data Base
- Supremal by means InSat MasterSCADA







Reference standards: *Nuclear: IEC 62318*

RMS WORKSTATION – OPERATOR CONSOLE

- Organization of interaction between the RMS Server and Monitors
- Single monitor console includes vandal-proof keyboard & UPS

Reference standards: *Nuclear: IEC 60987*

CONFIGURATOR SOFTWARE

Configurator software is intended for set-up, control, testing, adjustment and repair of RMS monitors.

It allows to view and keep archives of monitors measurement results.

- Communication through RS-232

RM RACK

RADIATION MONITORING RACK

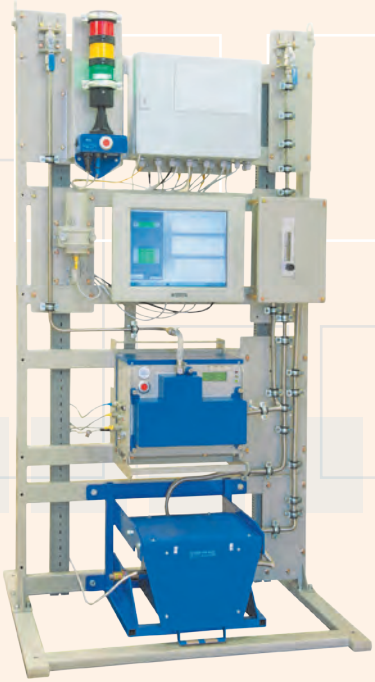
The radiation monitoring rack (RM Rack) is designed for continuous monitoring of radiation parameters in premises and technological systems at nuclear facilities. RM Rack can be used as a structural element of the lower-level of RMS at nuclear power plants and other nuclear facilities that are involved in obtaining, processing, use and storage of radioactive materials

Features:

Continuous automatic monitoring of the alpha- and beta-radioactive aerosol, beta-emitting radioactive gases and radioiodine concentrations in the working air and in the air in stacks and other radiation parameters in the facilities

The RM rack provides:

- Primary processing, storage and transmission of measured and related data into the information channel based on the Ethernet IEEE 802.3 interface (TCP/IP protocol)
- Transfer of required data to the location where the equipment is installed via technological channels based on RS-232 interface
- Generation of audible and visual warning / alarm signals when the preset thresholds are exceeded
- Display of received data on the LCD

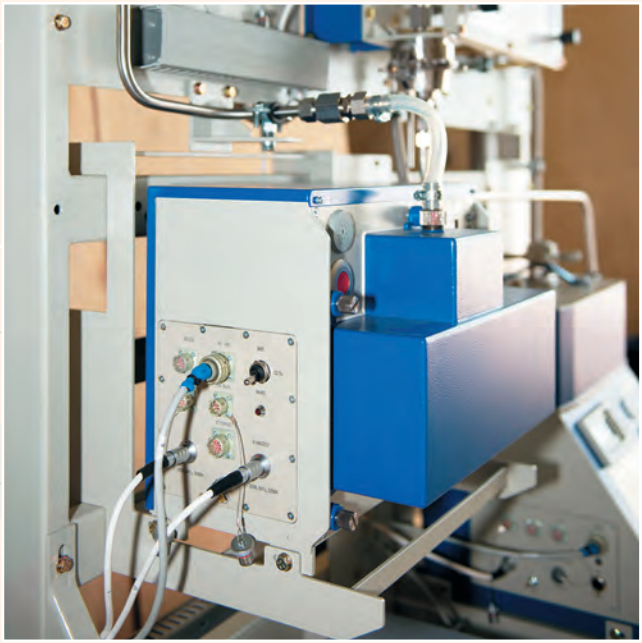


Delivery set:

Composition and modification depend on the tasks to be solved using the RM Rack/

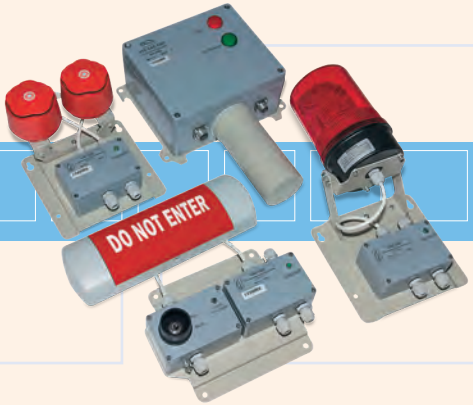
The rack, which is an integral part of RM Rack, accommodates:

- Monitors UDA-1AB, UDG-1B, UDG-03D, UDI-1B, UDGB-01T
- DBG-S11D: Wide range gamma area monitor, BDMG-101: High range gamma area monitor, UDMN-100: Neutron area monitor, BDRG-52R: High range gamma area monitor
- BI-2: Remote display & alarm unit
- Pump unit BN-01
- Data processing and transmission unit BOP-1M
- External alarm BAS or BAS-1s
- Equipment of sampling line (flow meters, ball valves, filter holder, piping, solenoid valve)
- Switchboard (intended for switching of all equipment and transfer of data to the upper level via the unified communication channel)



SRKS-01D

CRITICALITY ACCIDENT ALARM SYSTEM



Purpose:

- Detection and recording of criticality accident (CA) by measuring the absorbed dose rate of gamma-neutron radiation in the premises of monitored object, its comparison with a threshold value and generation of audible and visual signals
- Automatic collection, processing, storage and display of measurement data and related information as visual and graphical representation for operators of nuclear safety service

Functions of the system:

- Detection and recording of CA events by continuous measurement of absorbed dose rate of gamma radiation, comparison of measured values with preset thresholds, generation of signals to activate the alarm
- Activation of audible / visual alarm
- In the event of CA: turning on warning signals "DO NOT ENTER!" at illuminated information panels placed at the entrances to the controlled area

Features:

- Data can be transferred to external data communication channel using RS-485 interface (DiBus data exchange protocol)
- Automatic self-testing of detection units BR-04D with display of information about the type of fault
- Possibility for connecting additional detection and alarm units
- Ability to function in general, regardless of the functioning of components, within the agreed scope of nuclear safety tasks
- Radiation hardness up to 100 Gy

Features of software:

- Collection of information via RS-485 network, displaying it on the PC monitor, transmission to remote users, archiving and storage
- Status monitoring and display of values measured by BR-04D and DBG-S11D in locations as per layout of premises
- Access to archived data with possibility to generate reports on periods determined by operator;
- Maintenance and archiving of a log of dosimetric measurements data and events along with their time stamps
- Possibility to transfer data to external users via Ethernet network to integrate SRKS-01D into higher level systems

Basic complete set:

Lower level:

- Control unit with power supply
- Registration units SRKS, consisting of two BR-04D detection units
- BZS-01D: audible alarm units
- BSS-01D: visual alarm units
- SIT-01D: illuminated warning signs
- PBZ: panels for muting audible alarm
- Network communication module

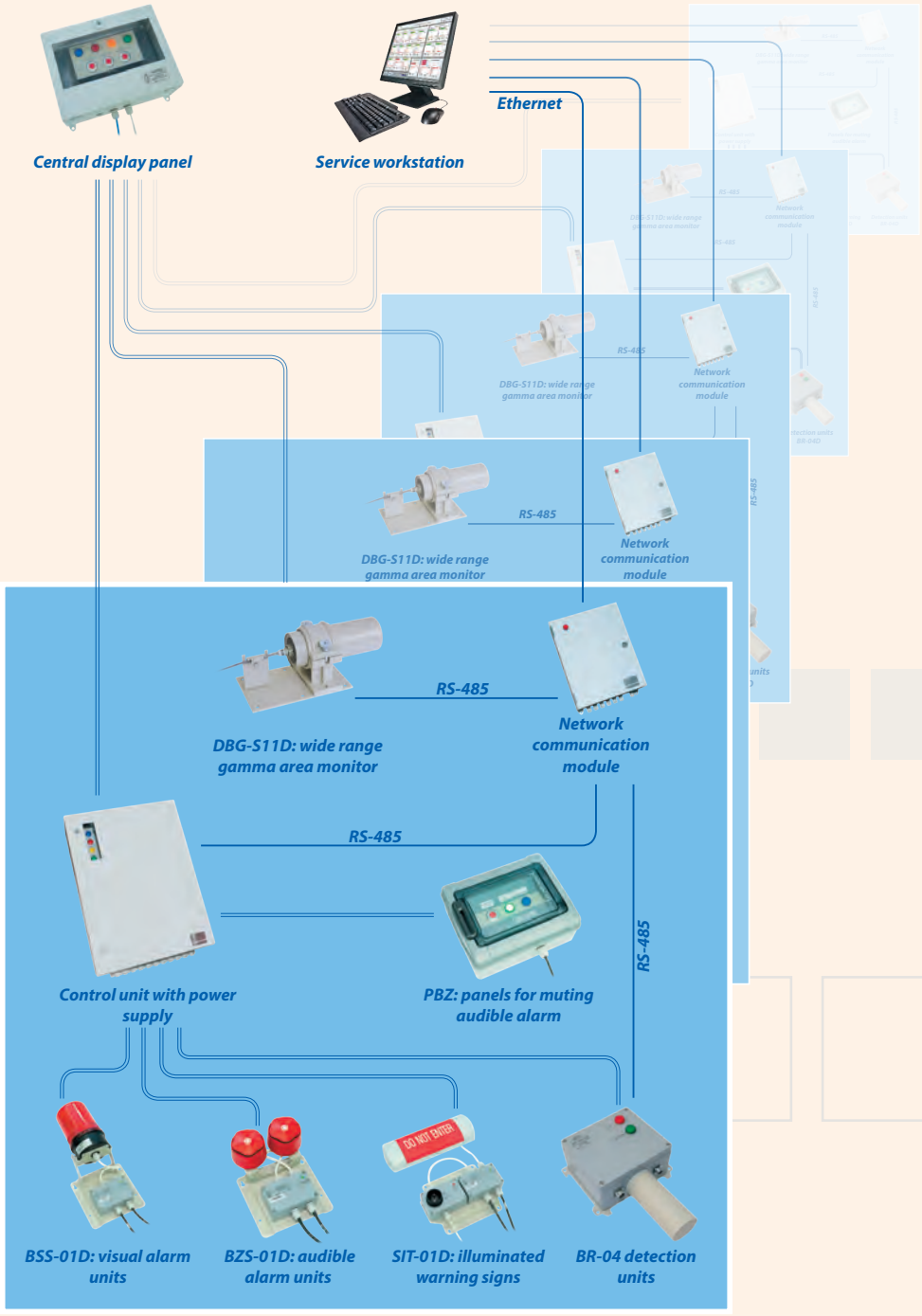
Additional lower layer devices:

- DBG-S11D: wide range gamma area monitor

Upper layer:

- CDP: central display panel
- Service workstation

Reference standards: *Nuclear: IEC 60860, ANSI/ANS-8.3, ISO 7753*


Central display panel
Service workstation
Ethernet
RS-485
DBG-S11D: wide range gamma area monitor
Network communication module
RS-485
DBG-S11D: wide range gamma area monitor
Network communication module
RS-485
Control unit with power supply
PBZ: panels for muting audible alarm
RS-485
DO NOT ENTER
BSS-01D: visual alarm units
BZS-01D: audible alarm units
SIT-01D: illuminated warning signs
BR-04 detection units

"ATLANT-M"

ENVIRONMENTAL RADIATION MONITORING SYSTEM

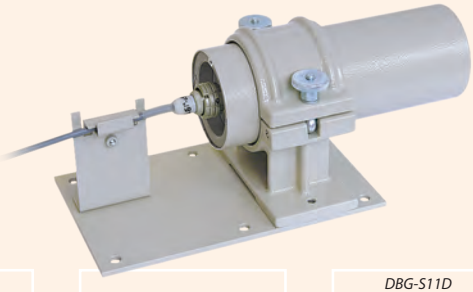
"Atlant-M" system is designed for the continuous radiation monitoring of territories and facilities and transmission of the data by GSM/GPRS network.

Purpose

- Environmental Radiation Monitoring System (ERMS)is used in control and buffer areas of the radiation and nuclear facilities

References:

- since the year 2000 the system has been successfully operating at 8 Russian nuclear power plants (177 monitoring stations)
- since the year 2005 ERMS have been operating in several regions of Russian Federation. 40 monitoring stations are located in Moscow
- list of operating ERMS at the Rosatom website: http://www.russianatom.ru/



DBG-S11D

Basic complete set

Monitoring stations:

- data processing and transmission unit BOP-1TA
- gamma area monitor DBG-S11D

Central data processing station (CDPS):

- data processing and transmission unit BOP-1TA
- server

By request:

- emergency Response and Crisis Management Centers for enterprises
- regional Emergency Response and Crisis Management Centers
- "Breeze" High-Volume Air Sampler
- nobile lab with gamma-survey system "Gamma-sensor"

Data transmission:

- GSM/GPRS

Power supply:

- 220 V, 50 Hz

Continuous autonomous operation (at 20 °C):

- from built-in battery: not less than 5 hours
- from external battery: not less than 24 hours

Operation temperature:

- −40 ÷ +50 °C

Operation humidity:

- Up to 98 %

Protection:

- IP65

Reference standards: *Nuclear: IEC 61017*

"BREEZE"

HIGH-VOLUME AIR SAMPLER

"Breeze" Air Sampler is designed for pumping of atmospheric air at constant flow rate through the filter.

The motor of the Air Sampler is controlled by an electronic flow sensor that detects changes in the operators pre-set flow rate caused by changes in temperature, barometric pressure, and pressure drop due to dust loading on filter media. It compensates these changes by adjusting the motor speed to maintain the pre-set flow rate.

Air Sampler can be equipped with radiation detection units that allows neasurement of ionizating radiation paramenters.

Physical characteristics

- Measurement range of air flow rate: 48 ÷ 2800 m^3/h
- Continuous operation time: not less than 24 h

Filter materials:

- Filter fabric FPP-15-1.5
- High-purity glass fiber
- Pure quartz or cellulose

Electrical characteristics

Power supply:

- 220/380 V, 50 Hz

Interfaces:

- RS-485
- Ethernet
- GSM/GPRS (option)

Environmental characteristics

Temperature range:

- −40 ÷ +40 °C

Relative humidity limit at 35 °C:

- 95 %

Atmospheric pressure range:

- 84.0 ÷ 106.7 kPa

Versions

- Stand alone unit
- Part of Environmental Radiation Monitoring System (ERMS) "Atlant-M"

“GAMMA–SENSOR”

GAMMA-SURVEY SYSTEM

"Gamma-Sensor" system is intended for gamma surveys of the territories; it is usually considered as an integral part of the moving radiological laboratory.

- Detection and locating of radiation sources and radioactive pollutions
- Automatic database maintenance – records contain information on dose rate, spectral data, time of measurement, and geographical coordinates
- Alarm signals when one of the dose rate thresholds is exceeded
- Works as a part of mobile laboratory or as a part of Environmental Radiation Monitoring System with real-time data transfer

Physical characteristics

Detector:

- Scintillation NaI (Tl), GM counters

Measurement range:

- 0.1 μSv/h – 10 Sv/h

Energy range:

- 0.05 – 3 MeV

Data storage:

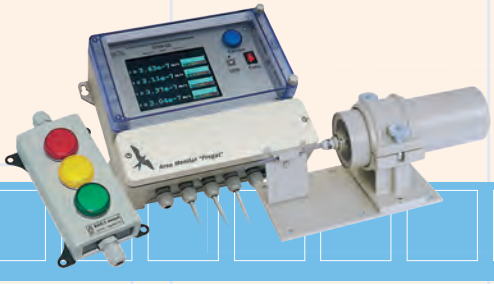
- Dose rate values
- Gamma spectra
- Dates and times of measurements
- Geographical coordinates of the measurement points
- Speed and direction
- Distances between measurement points.

Electrical characteristics

- power supply: 220 V, 50 Hz from MRL’s on-board autonomous power supply
- p ower consumption: not more than 200 VA

Radiation Monitoring Equipment

AREA MONITOR "FREGAT"



Area Monitor "Fregat" is designed for creating relatively simple and inexpensive radiation monitoring systems at such facilities as radionuclide sources storage areas, isotope products warehouses, nuclear medicine departments, PET centers, calibration laboratories where sources of ionizing radiation are used, etc.

Small scale automated radiation monitoring systems built with "Fregat" components, featuring audible and visual alarms, are idially suitable to meet the regulatory radiation safety requirements.

Area monitor "Fregat" requires virtually no adjustment; it is simple and convenient for installation and operation.

Service workstation

Ethernet / RS-485

BZS-2 "Micro": external audible alarm

DBG-S11D: wide range gamma area monitor

BAS-2 "Micro": external visual alarm

BPI-1D Local display unit

UDKS-100: gamma and X-ray area monitor

Illuminated warning signs

"Impuls" external display unit

UDMN-100: neutron area monitor

BPI-1D
LOCAL DISPLAY UNIT

Displays values of monitored parameters received from external measuring devices

Purpose

- Processing and display of values of monitored parameters at information panel
- Comparison of values of monitored parameters with thresholds
- Transfer of values of monitored parameters to network
- Alarm generation in case of exceeding of preset thresholds, including external alarm devices

Features

Testing the unit and connected devices:

- Visually on the panel
- Using adjustment software when connected to PC via USB

Automatic self-testing

The panel displays the following information:

- Diagnostic information about the status of connected devices
- Current date and time
- Values of measured parameters
- Position of measured values relative to the thresholds in the form of scales with green, yellow and red zones
- Time history (trend) for each measured value

Physical characteristics

Temperature range:

- 0 ÷ +50 °C

Maximum number of connected devices:

- Measuring devices: not more than 15
- External audible and visual alarm: not more than 16

Display, diagonal

- 14.2 cm (5.6")

Electrical characteristics

- Interfaces: RS-485
- Power supply: 220 V, 50 Hz; 12 ÷ 24 V

Mechanical characteristics

- Protection index: IP54
- Paint: decontaminable

Overall dimensions, weight:

- 296×248×118 mm, 6 kg

DETECTOR UNITS

DBG-S11D: WIDE RANGE GAMMA AREA MONITOR

Continuous automatic monitoring of the ambient dose equivalent rate.

DBG-S11D monitors come in three versions, that differ in measurement range and overall dimensions.

Physical characteristics

- Detector – GM counters

Measurement range:

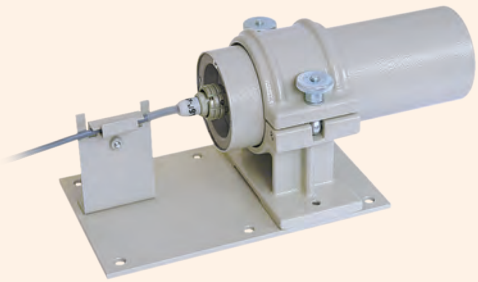
- DBG-S11D (basic version): 0.1 µSv/h ÷ 10 mSv/h
- DBG-S11D (version 01): 0.1 µSv/h ÷ 10 Sv/h
- DBG-S11D (version 02): 0.1 µSv/h ÷ 100 Sv/h

Energy range:

- 0.05 ÷ 3.0 MeV

Temperature range:

- −60 ÷ +80 °C



Electrical characteristics

- Interfaces: RS-485, USB

Mechanical characteristics

- Protection index: IP68
- Paint: decontaminable

Overall dimensions, weight:

- DBG-S11D (basic version): Ø68×141 mm, 0.65 kg
- DBG-S11D (version 01): Ø68×179 mm, 0.7 kg
- DBG-S11D (version 02): Ø68×179 mm, 0.7 kg
- Wall mount: 200×122×117 mm, 2.24 kg

Reference standards: *Nuclear: IEC 60532, EMC: IEC 61010, IEC 61000-6-2, Seismic: IEC 60980*

UDKS-100: GAMMA AND X-RAY AREA MONITOR

Continuous automatic monitoring of the gamma-X-ray ambient dose equivalent rate.

Physical characteristics

- Detector tissue-equivalent plastic scintillator Ø 30×15 mm

Measurement range:

- Dose rate measurement range 0.1 μSv/h ÷ 1 Sv/h
- Energy range 0.015 ÷ 10 MeV

Mechanical characteristics:

- Protection index: IP65
- Paint: decontaminable

Overall dimensions, weight:

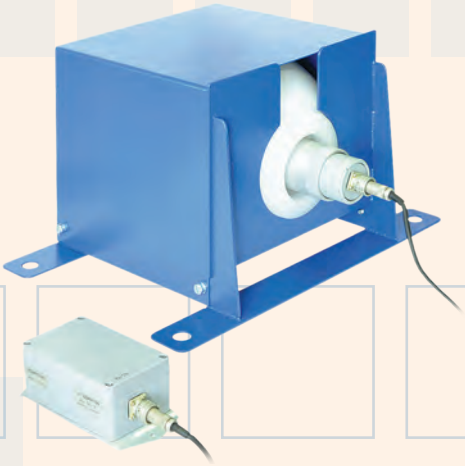
- Ø 60×192 mm, 1.5 kg

Reference standards: *Nuclear: IEC 60532*

UDMN-100: NEUTRON AREA MONITOR

Continuous automatic monitoring of the neutron-radiation ambient dose equivalent rate.

- Spherical polyethylene moderator Ø 239 mm



Physical characteristics

- Detector – scintillator ZnS(Ag), Li-6

Measurement range:

- 0.1 μSv/h ÷ 0.1 Sv/h

Energy range:

- 0.025 eV ÷ 10.0 MeV

Temperature range:

- −45 ÷ +50 ºC

Electrical characteristics

- Interfaces: RS-485

Mechanical characteristics

- Protection index: IP65
- Paint: decontaminable

Overall dimensions, weight:

- Detector: 428×258×347 mm, 11.5 kg
- Interface unit BS-12: 176×80×64 mm, 0.8 kg

Reference standards: *Nuclear: IEC 61322*

ALARM UNITS

BAS-2 “MICRO”: EXTERNAL VISUAL ALARM

Generation of visual signals in case of exceeding of preset thresholds

Physical characteristics

Length of communication cable:

- Up to 1200 m
- Alarm: Visual alarm: green, yellow, red

Electrical characteristics

- Power supply: +12 V

Mechanical characteristics

- Protection index: IP23

Overall dimensions, weight: 160×84×44 mm, 0.27 kg

BZS-2 “MICRO”: EXTERNAL AUDIBLE ALARM

Generation of audible signals in case of exceeding of preset thresholds

Physical characteristics

Length of communication cable:

- Up to 1200 m
- Audible alarm: 80 ÷ 100 dB at a distance of 1 m

Electrical characteristics

- Power supply: +12 V

Mechanical characteristics

- Protection index: IP23

Overall dimensions, weight: 140×84×57 mm, 0.55 kg

ILLUMINATED WARNING SIGNS

Physical characteristics

Length of communication cable:

- Up to 1200 m

Electrical characteristics

- Power supply: 220 V, 50 Hz

Mechanical characteristics

- Protection index: IP42

Overall dimensions, weight:

- 296×333×48 mm, 0.3 kg

"IMPULS": EXTERNAL DISPLAY UNIT

Physical characteristics

Length of communication cable:

- Up to 1200 m

Character height:

- "Impuls-910-R": 100 mm
- "Impuls-915-D4S": 150 mm
- "Impuls-927-D4S": 270 mm

Operating temperature range:

- "Impuls-910-R": 0 ÷ +50 °C
- "Impuls-915-D4S", "Impuls-927-D4S": –40 ÷ +50 °C

Electrical characteristics

- Power supply: 220 V, 50 Hz

Mechanical characteristics

Protection index:

- "Impuls-910-R: IP44
- "Impuls-915-D4S", "Impuls-927-D4S": IP65

Overall dimensions, weight:

- "Impuls-910-R": 400×160×65 mm, 3 kg
- "Impuls-915-D4S": 850×250×75 mm, 5 kg
- "Impuls-927-D4S": 1250×330×75 mm, 5 kg

UIM-D

RADIATION AREA / CONTAMINATION MONITOR

UIM-D area monitor provides solutions for different radiation protection problems depending of the chosen detector units.

Features

- Individual threshold setting for each measurement channel
- Continuous area and process monitoring
- Collects & displays data from two measurement channels (units with RS-485 or analog pulses)
- Audible and visual alarms on exceeding preset thresholds or status of connected devices
- Individual threshold setting for each measurement channel

Activation of the external alarm or executive devices when any threshold is exceeded

The wide panel displays the following information:

- Values of measured parameters as $min^{-1} \cdot cm^{-2}$, $s^{-1} \cdot cm^{-2}$, μSv/h
- Diagnostic information about the status of connected devices
- Current date and time
- Position of measured values relative to the thresholds in the form of scales with green, yellow and red zones
- Time history (trend) for each measured value

UIM-3D

DISPLAY UNIT

- Collects & displays data from two measurement channels, generates audible and visual alarms
- Displays data in CPM or in units per user's choice (μSv/h, $min^{-1} \cdot cm^{-2}$, etc.)
- Wireless connection to PC
- Can be mounted on a wall or on a table
- Shows measurement trends

Physical characteristics

Measurement range

- Count rate: up to 150 000 CPM

Operating temperature range

- −20 ÷ +50 °C

Electrical characteristics

- Power supply: 220 V , 50 Hz

Mechanical characteristics

- Protection index: IP65
- Overall dimensions, weight: 221×172×85 mm, 3.9 kg

OPTIONAL PROBES:

Measurement of alpha radiation flux density:

Detector unit
BDZA-100 (70 cm^2)
- Measurement range:
  0.1 ÷ 10^4 $min^{-1} \cdot cm^{-2}$

Detector unit
BDZA-100B (300 cm^2)
- Measurement range:
  0.1 ÷ $2 \cdot 10^3$ $min^{-1} \cdot cm^{-2}$

Measurement of beta radiation flux density:

Detector unit
BDZB-100 (28 cm^2)
- Measurement range:
  10 ÷ 10^5 $min^{-1} \cdot cm^{-2}$

Detector unit
BDZB-100L (30 cm^2)
- Measurement range:
  10 ÷ 10^4 $min^{-1} \cdot cm^{-2}$

Detector unit
BDZB-11D (84 cm^2)
- Measurement range:
  5 ÷ $1.5 \cdot 10^4$ $min^{-1} \cdot cm^{-2}$

Measurement of gamma radiation flux density:

Detector unit
BDEG-03
- Measurement range:
  4 ÷ 2000 $s^{-1} \cdot cm^{-2}$

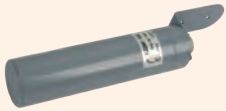
Detector unit UDKG-100
for operation in the
rocks, ore, liquid media
and sludge
- Measurement range:
  40 ÷ 8000 $s^{-1} \cdot cm^{-2}$

Measurement of neutron radiation ambient dose equivalent rate:

Detector unit
BDMN-100
- Measurement range:
  0.1 μSv/h ÷ 0.1 Sv/h

Measurement of gamma radiation dose rate:

Detector unit
BDMG-100
- Measurement range:
  0.1 μSv/h ÷ 10 Sv/h



Measurement of pulsed gamma and X-ray radiation dose rate:

Detector unit UDKS-100
- Measurement range:
  0.1 μSv/h ÷ 1 Sv/h

Measurement of the ambient dose equivalent rate:

Detector unit DBG-S11D
- Measurement range:
  - basic version:
    0.1 μSv/h ÷ 10 mSv/h
  - version 01:
    0.1 μSv/h ÷ 10 Sv/h
  - version 02:
    0.1 μSv/h ÷ 100 Sv/h

Reference standards: *Nuclear: IEC 60532, IEC 61322, IEC 60325*

DKG-09D

HIGHLY SENSITIVE GAMMA RADIATION DOSIMETER

Features

- High sensitivity: background measurement time with an error of 30 % – 5 seconds
- Color display
- Search mode
- PC connection via USB cable
- Recording of measurement parameters
- Two sound alarm modes

Physical characteristics

Detector:

- Scintillation with SiPM

Measurement range:

- Dose-rate: 0.1 μSv/h ÷ 5 mSv/h
- Dose: 0.1 μSv ÷ 1 Sv

Energy range:

- 0.05 ÷ 3 MeV

Accuracy:

- ±15%

Response time when dose-rate changes 10 times:

- 5 sec

Memory:

- Up to 9999 results

Electrical characteristics

Power supply:

- 3 pcs of AAA batteries

Mechanical characteristics

Protection index:

- IP65

Weight:

- 0.25 kg

Dimensions:

- 62×29×122 mm

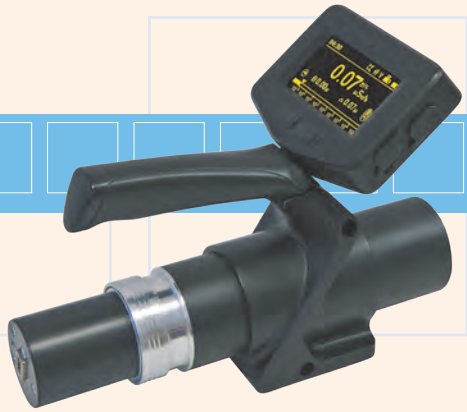
Environmental characteristics

- –40 ÷ +50 °C

Reference standards: *Nuclear: IEC 60846*

MKS-17D

DOSIMETER-RADIOMETER



The newest universal dosimeter-radiometer with the possibility of wireless connection to a PC and detection units.

Purpose

- Measurement of the ambient dose equivalent and ambient dose equivalent of photon radiation
- Operational and periodic monitoring of the radiation situation
- Measurement of surface contamination by gamma-active substances
- Search and localization of ionizing radiation sources
- Monitoring of radioactive contamination of scrap metal
- Radiation-ecological studies on construction sites
- Inspection of vehicles and goods during customs control

Features

- Highly sensitive scintillation detector
- Fast-charge Li-Po battery
- Bright, contrast display with a graphical interface
- Indication of exceeding the established threshold levels
- Threshold levels can be set in the entire range of measurement using the software "DoseAssistant"
- Radio or wired interface between a detection unit and a remote control unit
- Communication with the PC via radio
- Radiation survey of the terrain with reference to geographic coordinates based on GLONASS/GPS
- Possibility of headphones connection.

Physical characteristics

Energy range:

- 0.05 ÷ 3 MeV

Measurement range:

- Dose-rate: 0.05 μSv/h ÷ 3 Sv/h
- Dose: 0.1 μSv ÷ 10 Sv

Accuracy:

- ± 13 %

Operation mode setup time:

- 1 min

Non-volatile memory:

- Not less than 900 results

Electrical characteristics:

Power supply:

- 3,7 V

Charging time:

- Remote control unit: 4 h
- Wireless connection unit: 2 h

Environmental characteristics

Operation temperature range:

- −20 ÷ +50 °C

Mechanical characteristics:

Protection index:

- IP65

Reference standards: *Nuclear: IEC 60846*

DKG-05D

PERSONAL GAMMA DOSIMETER

Direct reading electronic gamma dosimeter for monitoring of personnel radiation exposure.

Measurement of gamma-radiation personal dose equivalent Hp(10) (PDE) and equivalent rate Hp(10) (PDER)

- Stand-alone dosimeter or as a part of an automatic dosimetry control system
- Audible and visual alarm
- Built-in memory for up to 1900 measurement results
- Exclusion of unauthorized intervention in dosimetry operation
- "Smart charging" feature extends battery life time

Features

- Complies with IEC 61526 (2010) "Radiation protection instrumentation - Measurement of personal dose equivalents Hp(10) and Hp(0,07) for X, gamma, neutron and beta-radiations – Direct reading personal dose equivalent meters"
- The dosimeter can store the dose history including up to 1900 measurement results in the built-in memory
- In case the battery is discharged, the information stored in the memory is kept for at least 5 years;
- Illuminated display
- Smooth setting of the of audible and visual alarm thresholds for PDE and PDER within full measurement range
- Self-test of electronics and detectors
- Sound and light alarm in case of exceeding the threshold levels of the PDE and PDER, low battery, negative self-test results
- Two-way infrared communication with the reader US-05 for stand-alone use or with UZS-01D when working as a part of an automated system
- Communication with the PC via the USB interface (US-05-01 or US-05B-01) or Ethernet (UZS-01D)
- Unauthorized person cannot compromise measurement results by erasing memory or changing settings; this can be done using work station (computer) only
- Two types of power supply: rechargeable NiMH battery/1 alcaline battery (type AAA)
- Charging units available for charging of 1, 28 or 56 dosimeters
- "Smart charging" feature extends battery life time up to 7 years

KZU-28

Reference standards: *Nuclear: IEC 61526*

Description of operation

Routine use of the dosimeters DKG-05D in the context of Automated System for Personal Dosimetry (ASPD) at facilities having a lot of radiation workers is automated as high as possible: a worker should withdraw any dosimeter from the charging unit at the entrance to the control area, insert it into the slot of the UZS-01D reader and then dial his/her personal ID (clock number). The reader reports the worker's ID and dosimeter number to the computer. ASPD software checks the worker's access code, assigns the dosimeter to the worker and sets the dose alarm threshold of the dosimeter according to the dose limit allowed for this worker. When worker exits the control area, he/she should again insert the dosimeter into the reader. Dose received by the worker is transferred to the computer. In case received dose is higher than the dose limit allowed for this worker, the reader will transfer the whole dose history (accumulation of dose with time).

For facilities with small number of radiation workers this procedure can be performed by the radiation supervisor using the reader US-05.

Physical characteristics

Detectors:

- Silicon semiconductor

Measurement range:

- Dose rate: 1 μSv/h ÷ 10 Sv/h
- Dose: 0.1 μSv ÷ 15 Sv

Energy range:

- 0.05 ÷ 3.0 MeV

Electrical characteristics

- Power supply: rechargeable NiMH battery/ 1 alcaline battery (type AAA)

Operation time:

- With NiMH battery till recharging: not less than 600 hours
- With one AAA battery: not less than 1000 hours

Environmental characteristics

- Temperature range: –20 ÷ +45 ºC
- Humidity: up to 98 % at 35 ºC

Alarm:

- Excess of alarm thresholds
- Warnings of self-test failure and battery discharge
- Audible alarm: 80 dB at 40 cm
- Visual alarm: blinking LED

Relative equipment:

- Charge unit for 1 dosimeter ZU-1M
- Charge units for 28/56 dosimeters KZU-28/KZU-56
- DKG-05D reader US-05-01 (US-05B-01)
- Universal reader UZS-01D

Reader-PC interface:

- US-05-01: USB
- DVS-01D: Ethernet

Mechanical characteristics

Overall dimensions, weight:

- 47×26×87 mm (with clip), 70 g

Protection index:

- IP65

Shock, vibration and drop resistant

DVS-02D

PERSONAL GAMMA-NEUTRON DOSIMETER

Direct reading electronic gamma-neutron dosimeter for monitoring of personnel radiation exposure.

Measurement of gamma- and neutron radiations personal dose equivalent Hp(10) (PDE) and dose equivalent rate Hp(10) (PDER) of mixed gamma-neutron radiation.

- Stand-alone dosimeter or as a part of an automatic dosimetry control system
- Audible and visual alarm
- Built-in memory for up to 900 measurement results
- Exclusion of unauthorized intervention in dosimetry operation
- Both albedo thermal neutrons and intermediate, fast neutrons registration
- Usable in the fields of Pu(Be), Po(Be), Cf and other neutron sources as well as near nuclear reactors without neutron spectrum estimation

Features

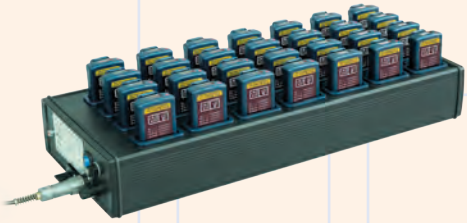
- Complies with IEC 61526 (2010) "Radiation protection instrumentation - Measurement of personal dose equivalents Hp(10) and Hp(0,07) for X, gamma, neutron and beta radiations - Direct reading personal dose equivalent meters"
- The dosimeter can be used for monitoring of exposure to neutron radiation without preliminary estimate of neutron spectrum in the working area;
- Calculation of total (gamma+neutron) dose and setting of thresholds for total dose
- The dosimeter can store the dose history in the built-in memory including up to 900 measurement results (time-dose) of mixed gamma-neutron radiation and up to 300 measurement results of neutron radiation
- Indication of total dose or neutron dose on the display
- Two-way infrared communication with the reader US-05 for stand-alone use or with UZS-01D when working as a part of an automated system
- Unauthorized person cannot compromise measurement results by erasing memory or changing settings; this can be done using work station (computer) only
- Smooth setting of the of audible and visual alarm thresholds for PDE and PDER within full measurement range
- Self-test of electronics and detectors;
- Illuminated display
- "Smart charging" feature extends battery life time up to 7 years

UZS-01D

Reference standards: *Nuclear: IEC 61526*

Description of operation

Measurement of personal dose equivalent Hp(10) of neutron radiation is performed using two measurement channels: the channel for albedo thermal neutrons (neutrons moderated in the body and that escape the body in the area where the dosimeter is worn) and the channel for fast neutrons, directed to the body from outside. In the albedo channel, the dosimeter registers alpha particles from lithium target due to 6Li(n,α)3H reaction (the target is placed on the surface of silicon detector). Fast neutrons are registered by recoil protons that appear in the polyethylene target due to elastic scattering of fast neutrons (the target is placed on the detector). Dose equivalent Hp(10) is calculated according to special algorithm taking into account measurement information from both "albedo" and "fast" channels. Thanks to the presence of two measurement channels, the dependence of sensitivity on neutron energy of the DVS-02D is far less when compared with other measurement methods, that makes it possible to use the dosimeter for personal exposure monitoring in the fields of Pu(Be), Po(Be) and other neutron sources as well as near nuclear reactors, without preliminary estimate of neutron spectrum.



Physical characteristics

Detectors:

- Silicon semiconductor

Gamma measurement range:

- Dose rate: 1 μSv/h ÷ 10 Sv/h
- Dose: 1 μSv ÷ 15 Sv

Gamma energy range:

- 0.05 ÷ 6.0 MeV

Neutron measurement range:

- Dose rate: 1 μSv/h ÷ 2 Sv/h
- Dose: 20 μSv ÷ 15 Sv

Neutron energy range:

- 0.025 eV ÷ 20 MeV

Electrical characteristics

Power supply:

- Rechargeable NiMH battery
- Operatiion time till recharging: not less than 200 hours

Environmental characteristics

- Temperature range: –20 ÷ +50 ºC
- Humidity: up to 95 % at 30 ºC

Alarm:

- Excess of alarm thresholds
- Warnings of self-test failure and battery discharge
- Audible alarm: 80 dB at 40 cm
- Visual alarm: blinking LED

Relative equipment:

- Charge unit for 1 dosimeter ZU-1M
- Charge units for 28/56 dosimeters KZU-28/KZU-56
- DVS-02D reader US-05-01
- Universal reader UZS-01D

Reader-PC interface:

- US-05-01: USB
- DVS-01D: Ethernet

Mechanical characteristics

Overall dimensions, weight:

- 87×47×28 mm (with clip), 80 g

Protection index:

- IP65

Shock, vibration and drop resistant

IRAA–01D

THRESHOLD ALARM UNIT FOR RADIOACTIVE AEROSOLS

Monitoring of radioactive aerosols in the work area

Purpose

- Continuous measurement of volumetric activity of radioactive aerosols due to artificial alpha-emitting nuclides
- Sound/light alarm in the event that the measured values of volumetric activity exceed the preset threshold levels

Features

- Stationary installation at the working area air monitoring points
- Connection to the pump unit BN-01
- Or another external sampling device
- Service interface USB for diagnostics, adjustment and calibration

Physical characteristics

Measurement range of volumetric activity:

- 1.0 ÷ 2.0·10^5 Bq/m^3

Energy range of alpha particles detection:

- 3.0 ÷ 8.0 MeV

Sensitivity coefficient for particles within energy range based on ^{239}Pu:

- Not less than 0.02

Intrinsic background of alarm unit:

- Not more than 1.0·10^{-1} Bq/m^3

Air flow rate through the filter:

- 20 ÷ 40 l/min

Measurement range of air volume pumped through the filter:

- 10 ÷ 100000 l/min

Power supply:

- 220 V, 50 Hz

Electrical characteristics:

Power consumption:

- 50 V·A

Mechanical characteristics:

Overall dimensions:

- 350×156×482 mm

Weight:

- not more than 6 kg

Reference standards: *Nuclear: IEC 61172*

DKG-02U "ARBITER"

WIDE RANGE GAMMA-DOSIMETER

Measurement of gamma radiation ambient equivalent dose H*(10) and dose rate H*(10)

- Audible signals (clicks) for radiation condition estimation
- Analog scale for search mode
- Audible and visual alarms of the excess of preset dose and dose rate thresholds
- Shock-resistant, water-proof, easy decontamination case
- 100 measurement results memory with date and time of measurement
- Indication of total dose accumulated during exploitation time
- Indication of measurement result statistical uncertainty

Physical characteristics

Detectors:

- GM counters

Measurement range:

- Dose-rate: 0.1 μSv/h ÷ 3 Sv/h
- Dose: 1 μSv ÷ 100 Sv

Energy range:

- 0.05 ÷ 3 MeV

Electrical characteristics

- Power supply: 2 alcaline batteries (type AA)
- Batteries life: not less than 200 hours

Mechanical characteristics

Overall dimensions, weight:

- 152×82×32 mm, 0.3 kg

Protection index:

- IP65

Shock, vibration and drop resistant

Environmental characteristics

- Temperature range: –20 ÷ +50 °C
- Humidity: up to 90 % at +25 °C

Reference standards: *Nuclear: IEC 60846*

DKG-07D “DROZD”

GAMMA-DOSIMETER

Measurement of gamma radiation ambient equivalent dose H*(10) and dose rate H*(10)

- Two independent measurement channels: dose and dose rate
- Audible signals (clicks) for radiation condition estimation
- Continuous measurement with updating measurement result
- Measurement result can be obtained with any desired statistical uncertainty (error)
- Automatic restart when radiation level sharply changes
- Indication of statistical uncertainty (error) during measurement process

Physical characteristics

Detectors:

- GM counter

Measurement range:

- Dose-rate: 0.1 μSv/h ÷ 1 mSv/h
- Dose: 1 μSv ÷ 0.2 Sv

Energy range:

- 0.05 ÷ 3 MeV

Temperature range:

- –20 ÷ +50 °C

Electrical characteristics

- Power supply: 2 alcaline batteries 1.5 V (type AA)
- Batteries life: not less than 200 hours

Mechanical characteristics

Overall dimensions, weight:

- 122×74×29 mm, 0.25 kg

Reference standards: *Nuclear: IEC 60846*

MKS-15D "SNEGIR"

MULTI-PURPOSE RADIATION SURVEY METER

Continuous measurement with updating measurement result

Automatic restart when radiation level sharply changes

- Gamma dose H*(10) and dose-rate H*(10) measurement
- Beta and gamma contamination survey
- Indication of statistical uncertainty during the measurement
- Continuous measurement with accuracy increasing over time
- Automatic restart triggered by change of gamma dose-rate
- Compensation of gamma count rate while measuring beta radiation
- Indication of battery charge level
- Audible signal of the excess of preset threshold

Physical characteristics

Detectors:

- GM counter

Measurement range:

- Dose-rate: 0.1 μSv/h ÷ 2.0 mSv/h
- Dose: 1 μSv ÷ 10.0 Sv
- Beta flux density (for Sr-90+Y-90): $10 \div 10^5$ $cm^{-2} \cdot min^{-1}$

Energy range:

- Gamma: 0.05 ÷ 3 MeV
- Beta: 0.1 ÷ 3 MeV

Temperature range:

- −20 ÷ +50 °C

Electrical characteristics

- Power supply: 2 alcaline batteries (type AA)
- Battery life: not less than 400 hours

Mechanical characteristics

Overall dimensions, weight:

- 124×72×35 mm, 0.35 kg

MKS-15D "Snegir" backside

Reference standards: *Nuclear: IEC 60846, IEC 60325*

DOZA-TLD

MULTIPURPOSE TLD SYSTEM

TLD reader for day-to-day tests

No nitrogen required for heating

The system is designed to be used:

- For monitoring of radiation exposure of personnel at enterprises (including nuclear power plants) that manufacture or use radioactive materials or ionizing radiation sources, under normal and emergency radiation conditions, and of population in the areas adjacent to the enterprises that use radioactive materials – Pe system class (all)
- For monitoring of environment, residential and industrial buildings, at facilities that use radioactive materials and other sources of ionizing radiation – En system class

Measurement of

- Gamma and X-ray personal dose equivalent Hp(10)
- Neutron personal dose equivalent Hp(10)
- Lens dose equivalent Hp(3)
- Skin dose equivalent Hp(0.07)
- Ambient dose equivalent H*(10) of photon radiation

Features

- One-piece execution
- Manual loading of detectors and automatic dose measurement
- High accuracy of setting the time (up to 0.1 s) and the heating temperature (up to 1 °C)
- Visual control of the heating temperature
- The presence of a system for protecting the heating element from overheating
- loading into the reader simultaneously up to 4 detectors
- The DVG program provides:
  - Control of measurements of detectors in real time
  - Processing of measurement results
  - Maintaining a database of individual dosimetric control (IDC)
  - Reporting to the operator on the results of measurements on the monitor and printing them out

Technical parameters of the system

- Duration of reading one dosimeter with linear heating of detector at heating rate 10 °C·s^{-1} not more than 60 s
- Warm-up time of the reader not more than 30 min
- Continuous operation of the reader not less than 24 h
- Operating temperature +10 to +35 °C
- Maximum relative humidity 75 % at +30 °C
- Atmospheric pressure 84.0 to 106.7 kPa
- Power consumption of the reader 200 V·A
- Overall dimensions, not more than 550×185×418 mm
- Weight, not more than 11.3 kg

Mechanical characteristics

Dosimeters overall dimensions, weight:

- Gamma Hp(10): DTL-2 holder: 62×26×16 mm, 16 g
- DTU holder: 42×28×18 mm, 8 g
- Lens Hp(3), face skin Hp(0.07): Ø 32×16 mm, 9 g
- Finger skin Hp(0.07): 90×20×2 mm, 1 g
- Neutron, gamma Hp(10): 48×40×20 mm, 30 g

Reference standards: *Nuclear: IEC 61066*

Detectors for DOZA-TLD

Detector type	*Appearance*	*Measurement range*	*Energy range*
Gamma and X-ray Hp(10)			
TLD-3 (LiF: Mg, Ti; LiF: Mg, Cu, P)	62×21×12.4 mm, 16 g	20.0 μSv ÷ 10 Sv	0.015 ÷ 18.0 MeV
DTU-1 (LiF: Mg, Ti)	42×28×18 mm, 8 g	20.0 μSv ÷ 10 Sv	0.015 ÷ 18.0 MeV
DTU-2 (Al_2O_3)	42×28×18 mm, 8 g	20.0 μSv ÷ 5 Sv	0.08 ÷ 6.0 MeV
Neutron personal dose equivalent Hp(10)			
DVNG-M (^{6}LiF: Mg, Ti; ^{7}LiF: Mg, Ti)	48×40×20 mm, 30 g	Photon 20.0 μSv ÷ 10 Sv Neutron 100.0 μSv ÷ 2 Sv	Photon 0.015 ÷ 18.0 MeV Neutron 0.025 eV ÷ 20.0 MeV
Skin dose equivalent Hp(0.07)			
Finger Ring Type G (LiF: Mg, Ti; LiF: Mg,Cu,P)		20.0 μSv ÷ 10 Sv	0.01 ÷ 6.0 MeV
Finger Ring Type BG (LiF: Mg, Cu, P)	48×40×20 mm, 30 g 91×12×3 mm, 1.0 g	20.0 μSv ÷ 10 Sv	Photon 0.0076 ÷ 6.0 MeV Beta 0.05 ÷ 3.0 MeV
Lens dose equivalent Hp(3)			
EYE-D (LiF: Mg, Ti; LiF: Mg, Cu, P)	71×16×8 mm, 3.0 g	20.0 μSv ÷ 10 Sv	Photon 0.015 ÷ 18.0 MeV Beta 0.7 ÷ 3.0 MeV
Ambient dose equivalent H(10) of photon radiation*			
DTU-1 (LiF: Mg, Ti)	42×28×18 mm, 8 g	20.0 μSv ÷ 10 Sv	0.03 ÷ 3.0 MeV
DTU-2 (Al_2O_3)	42×28×18 mm, 8 g	20.0 μSv ÷ 0.5 Sv	0.08 ÷ 3.0 MeV

DKS-96

DOSIMETER / RADIOMETER

UIK-05 control unit

Popular dosimeter / radiometer distinguished by its reliability and a wide choice of detectors suitable for all main applications of dosimetry and radiometry.

- Continuous and pulsed gamma and X-ray dose H*(10) and dose-rate measurement
- Alpha, beta and gamma contamination survey
- Neutron dose H*(10) and dose-rate measurement
- Gamma radiation flux density in boreholes and liquid media measurement
- Search and localization of radioactive sources and contaminations
- Radiation survey of territories with fixing of geographical coordinates using GPS sensor

UIK-06 control unit

Features

- Automatic determination of detector type and selection of corresponding measurement modes;
- Indication of dynamic scale and signaling information about the instrument's status and all measured quantities (excess of thresholds, presence of external interference, battery status, etc.)
- A lot of alarm threshold settings – for dose and dose-rate (lower, upper warning and upper thresholds), for alpha and beta contaminations
- Fast monitoring mode using three preset thresholds;
- Convenient keyboard with direct access buttons for display illumination and thresholds control
- "Search" and "detection" modes of operation allow to perform surveys in a more effective way
- USB interface for communication with PC
- Nonvolatile memory for 2000 measurement results

Case

Set of delivery

- Contol unit UIK-05/UIK-05-01/UIK-06
- Probes (at the customer's choice)
- Plastic case
- Datasheet and User manual

Reference standards: *Nuclear: IEC 60846, IEC 60325, IEC 61005, IEC 62363*

Technical characteristics

Type of control unit	UIK-05	UIK-05-01	UIK-06
Appearance			
Body	Handheld. Metal shock-proof case	Handheld. Metal shock-proof case	Handheld. Plastic shock-proof case
Protection index	IP54	IP54	IP54
Power supply	• Battery power PNN-02-02 (4 batteries type C)	• Power module PNN-02-03 (4 accumulators type AA), charger ZU-02S • Car charger (ZU-06S)	• 3 accumulators type AA, charger ZU-02S • Car charger (ZU-06S)
Interface	RS-232 (with cable-adapter PI-03-01)	RS-232 (with cable-adapter PI-03-01)	RS-232 (with cable-adapter PI-03-01)
Alarm system	• Audible signals • Headphones	• Audible signals • Headphones	• Audible signals
Warm-up time	Less than 1 min	Less than 1 min	Less than 1 min
Continuous operation time	50 ÷ 200 hours	35 ÷ 210 hours	10 ÷ 75 hours
Instability of results during 10 hours of measurements	±10 %	±10 %	±10 %
Operation temperature range	–20 ÷ +50 °C	–20 ÷ +50 °C	–20 ÷ +50 °C
GPS	+	+	+
Overall dimensions	210×100×85 mm	210×100×85 mm	165×80×50 mm
Weight	0.9 kg	0.9 kg	0.4 kg

EXTERNAL PROBES ALPHA

ALPHA: BDZA-96

Standard probe for alpha radiation measurements

Detector:

- ZnS(Ag) 70 cm^2

Measurement range (for Pu-239):

- 0.1 ÷ 10^4 $min^{-1} \cdot cm^{-2}$

Overall dimensions, weight:

- Ø 130×240 mm, 0.9 kg

BDZA-96

ALPHA: BDZA-96B

Large area probe for alpha radiation measurements. Recommended for contamination monitoring of hands

Detector:

- ZnS(Ag) 300 cm^2

Measurement range (for Pu-239):

- 0.1 ÷ $2 \cdot 10^3$ $min^{-1} \cdot cm^{-2}$

Overall dimensions, weight:

- Ø 230×290 mm, 4.0 kg

BDZA-96b

ALPHA: BDZA-96M

Small area probe for alpha radiation measurements

Detector:

- ZnS(Ag) 10 cm^2

Measurement range (for Pu-239):

- 0,1 ÷ 10^5 $min^{-1} \cdot cm^{-2}$

Overall dimensions, weight:

- Ø 65×240 mm, 0.9 kg

BDZA-96m

ALPHA: BDZA-96S

Medium area probe for alpha radiation measurements.

Detector:

- ZnS(Ag) 30 cm^2

Measurement range (for Pu-239):

- 0.1 ÷ $5 \cdot 10^4$ $min^{-1} \cdot cm^{-2}$

Overall dimensions, weight:

- Ø 90×240 mm, 1.0 kg

BDZA-96s

ALPHA: BDZA-96T

Probe intended for measurements of alpha contamination of non-easily-testable objects and in hard-to-reach places

Detector: Silicon 5 cm^2

Measurement range (for Pu-239):

- 0.1 ÷ 10^6 $min^{-1} \cdot cm^{-2}$

Overall dimensions, weight:

- Ø 50×60 mm, 0.15 kg

BDZA-96t

EXTERNAL PROBES BETA

BETA: BDZB-96

Standard probe for measurement of beta particles flux density and evaluation of gamma radiation dose rate

Detector: Scintillator 28 cm^2

Measurement range (for Sr-90+Y-90):

- 10 ÷ 10^5 $min^{-1} \cdot cm^{-2}$

Energy range:

- 0.3 ÷ 3.0 MeV

Overall dimensions, weight:

- Ø 90×230 mm, 0.9 kg

BDZB-96

BETA: BDZB-99

Probe with gas discharge counter (mica window) for measurement of beta particles flux density and evaluation of gamma radiation dose rate

Detector:

- GM counter 30 cm^2

Measurement range (for Sr-90+Y-90):

- 20 ÷ 10^4 $min^{-1} \cdot см^{-2}$

Energy range:

- 0.12 ÷ 3.0 MeV

Overall dimensions, weight:

- Ø 88×80 mm, 0.4 kg
- Telescopic pole length 0.7 m

BDZB-99

BETA: BDZB-96B

Probe automatically compensates for gamma radiation contribution to the measurement results. Suitable for contamination monitoring of hands and cloth

Detector: GM counter 80 cm^2

Measurement range (for Sr-90+Y-90):

- 3 ÷ 10^4 $min^{-1} \cdot cm^{-2}$

Energy range:

- 0.12 ÷ 3.0 MeV

Overall dimensions, weight:

- 150×200×110 mm, 1.5 kg

BDZB-96b

BETA: BDZB-96S

- Probe for measurement of beta radiation with Beta-2 counter.
- Detector: GM counter 15 cm^2

Measurement range (for Sr-90+Y-90):

- 10 ÷ 10^5 $min^{-1} \cdot cm^{-2}$

Energy range:

- 0.12 ÷ 3.0 MeV

Overall dimensions, weight:

- Ø65×65 mm, 0.3 kg
- Telescopic pole length 0.7 m

BDZB-96s

ALPHA AND BETA: BDPS-96

- Probe for measurement of flux density of alpha and beta particles

Detector: Scintillator 28 cm^2

Measurement range:

- Alpha: 0,2 ÷ 10^4 $min^{-1} \cdot cm^{-2}$
- Beta: 10 ÷ 10^5 $min^{-1} \cdot cm^{-2}$

Energy range:

- 0.3 ÷ 3.0 MeV

Overall dimensions, weight:

- Ø88×280 mm, 1.2 kg

BDPS-96

EXTERNAL PROBES GAMMA

GAMMA: BDKS-96B

Probe for measurement of continuous and pulsed gamma and X-ray radiation. PMT dark current is compensated electronically, no mechanical shutter inside probe

Detector:

- Tissue-equivalent scintillator Ø30×15 mm

Measurement range:

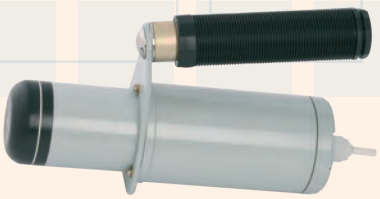
- Dose rate H*(10): 0.1 µSv/h ÷ 1 Sv/h
- Dose H*(10): 0.1 µSv ÷ 10 Sv

Energy range:

- 0.015 ÷ 10 MeV

Overall dimensions, weight:

- Ø60×250 mm, 0.85 kg



BDKS-96b

GAMMA AND BETA: BDKS-96S

Probe for measurement of gamma and beta radiation (accompanied by gamma background). Automatic compensation for gamma background during beta measurements

Detector:

- Double GM counters

Measurement range:

- Gamma dose rate H*(10): 0.1 μSv/h ÷ 1 mSv/h
- Gamma dose H*(10): 0.1 μSv ÷ 1.0 Sv
- Beta: 10 ÷ $3 \cdot 10^4$ $min^{-1} \cdot cm^{-2}$

Energy range:

- Gamma: 0.05 ÷ 3 MeV
- Beta: 0.12 ÷ 3 MeV

Overall dimensions, weight:

- Ø 80×80 mm, 0.35 kg
- Telescopic pole length 0.7 m

BDKS-96s

GAMMA: BDMG-96

Wide range probe for gamma radiation with automatic switch between scales for low and high dose rate values

Detector:

- GM counters

Measurement range:

- Dose rate H*(10): 0.1 μSv/h ÷ 10 Sv/h
- Dose H*(10): 0.1 μSv ÷ 10 Sv

Energy range:

- 0.05 ÷ 3 MeV

BDMG-96

Overall dimensions, weight:

- 40×250 mm, 0.5 kg
- Telescopic pole length: 0.7 m, 3.8 m (by request)

GAMMA: BDKG-96

Probe with stainless steel casing for geologic applications, well logging, concentration inspection of radioactive substances in the soil, the pulp and water.

Detector:

- Scintillator NaI(Tl) Ø 18×30 mm

Measurement range:

- Flux density measurement range: 10 ÷ 10^5 $s^{-1} \cdot cm^{-2}$
- Dose rate H*(10) for Cs-137: 5 ÷ $2 \cdot 10^4$ μR/h
- Sensitivity for Cs-137: 2 ±0,4 $s^{-1}/(\mu Sv \cdot h^{-1})$

Overall dimensions, weight:

- Ø 38×535 mm, 3.6 kg
- Cable length: 10 ÷ 1000 m

BDKG-96m

GAMMA-SEARCH: BDVG-96

Probe with very high sensitivity to gamma radiation

Recommended for the control of scrap metal, domestic and industrial waste in large quantities.

Detector:

- Scintillator NaI(Tl) Ø 63×63 mm

Measurement range:

- Flux density measurement range: 4 ÷ 2000 $s^{-1} \cdot cm^{-2}$
- Dose rate H*(10) for Cs-137: 0.1 ÷ 30 µSv/h
- Sensitivity for Cs-137: 3000 (pulses·s^{-1})/(µSv·h^{-1})

Overall dimensions, weight:

- Ø 88×400 mm, 2.0 kg
- Modular pole length: 1.6 m

BDVG-96

GAMMA-SEARCH: BDPG-96

Probe with high sensitivity to gamma radiation. Recommended for searching of gamma radiation sources during the local areas surveys, for control of scrap metal, domestic and industrial waste, development areas, living quarters and workplaces.

Detector:

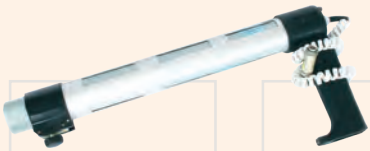
- Scintillator NaI(Tl) Ø 25×40 mm

Measurement range:

- Flux density measurement range: 10 ÷ 8000 $s^{-1} \cdot cm^{-2}$
- Dose rate H*(10) for Cs-137: 0.1 ÷ 100 µSv/h
- Sensitivity for Cs-137: 500 (pulses·s^{-1})/(µSv·h^{-1})

Overall dimensions, weight:

- 50×190×480 mm, 1.0 kg
- Telescopic pole length: 0.7 m



BDPG-96

GAMMA-SEARCH: BDPG-96M

Probe with sensitivity sufficient for survey applications. Suitable for detection of radiation sources in hard-to-reach places.

Detector:

- Scintillator NaI(Tl) Ø 18×30 mm

Measurement range:

- Flux density measurement range: 10 ÷ 24000 $s^{-1} \cdot cm^{-2}$
- Dose rate H*(10) for Cs-137: 0.1 ÷ 300 µSv/h
- Sensitivity for Cs-137: 200 (pulses·s^{-1})/(µSv·h^{-1})

Overall dimensions, weight:

- Ø 35×320 mm, 0.5 kg
- Telescopic pole length: 0.7 or 3.8 m

BDPG-96m

EXTERNAL PROBES
NEUTRON

NEUTRON: BDMN-96

Probe with moderator for neutron dose and dose rate measurements.

Detector:

- Scintillator with ZnS(Ag)

Measurement range:

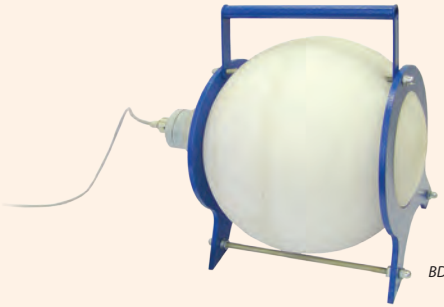
- Dose rate H*(10): 0.1 μSv/h ÷ 0.1 Sv/h
- Dose H*(10): 0.1 μSv ÷ 1.0 Sv

Energy range:

- 0.025 eV ÷ 10 MeV

Overall dimensions, weight:

- Detector: Ø 54×200 mm, 0.8 kg
- Moderator: Ø 245 mm, 7.3 kg



BDMN-96

NEUTRON-SEARCH: BDKN-96

Probe for measurements of dose rate, power flux density and neutron dose

Detector:

- He-3 counter in polyethilene moderator

Measurement range:

- Dose rate H*(10) for Pu-Be: 0.1 μSv/h ÷ 0.1 Sv/h
- Dose H*(10) for Pu-Be: 0.1 μSv ÷ 1.0 Sv

Energy range:

- 0.025 eV ÷ 14 MeV

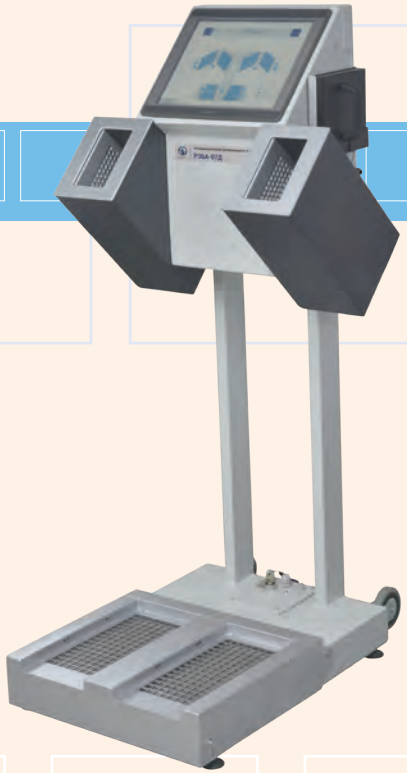
Overall dimensions, weight:

- 295×142×100 mm, 2.25 kg

BDKN-96

RZBA-07D

HAND-FOOT-CLOTHING MONITOR



High sensitivity monitor RZBA-07D is designed for measurement of contamination level by alpha and beta-active materials of personnel's hands, feet/shoes and clothing and alarming when the thresholds are exceeded. The monitor is recommended for monitoring personnel contamination at NPPs, nuclear fuel cycle facilities, radiologic laboratories and other enterprises that use radioactive substances.

Features

- advanced and intuitive interface, easy at operation
- availability of a version with a remote beta detector unit, BDZB-09D, or alpha detector unit, BDZA-07D;
- smooth adjustment of alarm thresholds within full measurement range;
- voice instructional support while measuring;
- determination of hand/foot position in the detected area; voice and visual support for correct positioning;
- simultaneous colour and sound indication of measurement results;
- automatic compensation of external gamma background after every measurement;
- alarm if detector units are defective and/or contaminated.

Physical characteristics

- Type of detectors: plastic scintillation

Energy range:

- beta radiation: 0.1 ÷ 2.5 MeV
- alpha radiation: 4.16 ÷ 5.6 MeV
- gamma radiation: 0.05 ÷ 1.5 MeV

Measurement range of flux density:

- beta radiation: 1 ÷ 25 000 $min^{-1}cm^{-2}$
- alpha radiation: 0.1 ÷ 10 000 min^{-1} cm^{-2}

Time of one exposure: 10 s

Continuous operation time: ≥ 24 h

Operating temperature range

- 0 ÷ +50 °C

Electrical characteristics

- Power supply
- 220 V, 50 Hz
- Power consumption ≤ 150 W

Mechanical characteristics

Overall dimensions, weight:

- RZBA-07D monitor 809×614×1444 mm, 85 kg
- BDZB-09D detector unit 168×176×70 mm, 1.4 kg
- BDZA-07D detector unit 168×176×70 mm, 1.4 kg

Detectors overall dimensions:

- Hand: 288 cm^2
- Foot: 465 cm^2
- Alpha detector unit: 144 cm^2

Reference standards: *Nuclear: IEC 61098*

RZBA-04-04M

WHOLE BODY CONTAMINATION MONITOR

Multichannel monitor with audible and visible alarms for preset levels (thresholds) of contamination with beta emitting radionuclides. The monitor generates indication (signal) "CLEAN" and release the gate provided that the measured values are below the contamination threshold in all channels. Available models differ by the number of monitored parts of the body, by presence of optional remote detector units for alpha and beta radiation

Features

- Warning light "READY" (ready for measurement);
- Visible and audible alarms "CONTAMINATION" and "CLEAN"
- Individual threshold setting for each measurement channel
- Automatic compensation for background gamma radiation and contamination of detector units
- Indication of the contamination level for each detector unit from a system keyboard
- Automatic self-test capability for detectors and measurement channels
- Indication of contaminated part(s) of the body on the panel with mnemonic image of the body
- Availability of different models: number of measurement channels differs from 15 to 20, optional detectors for monitoring of head, dorsal sides of hands, remote detectors for alpha and beta radiation, and the built-in computer

Physical characteristics

Detectors:

- Beta - GM counters/scintillators
- Alpha - scintillatior ZnS(Ag)

Measurement range:

- Beta: 1 ÷ 15000 $min^{-1} \cdot cm^{-2}$
- Alpha: 0.1 ÷ 10000 $min^{-1} \cdot cm^{-2}$

Energy range:

- Beta: 0.15 ÷ 2.5 MeV
- Alpha: 4.13 ÷ 5.6 MeV

Operation temperature range:

- +5 ÷ +50 °C

Electrical characteristics

Power supply:

- 220 V, 50 Hz

Interfaces:

- RS-232, RS-485

Mechanical characteristics

Overall dimensions, weight:

- 2560×940×810 mm, 310 kg

Reference standards: *Nuclear: IEC 61098*

RZA-05D

ALPHA HAND-MONITOR

High-sensitivity system intended for determination of hands contamination with alpha emitting radionuclides. The system is suitable for use in sanitary inspection rooms, at contamination portals, in the facilities working with alpha-active substances (materials)

Features

- Numeric and color (red, green) indication of measurement results
- LED sensor of hand- positioning for start of measurement
- Visual and audible alarm signals in case the preset thresholds are exceeded
- Access key for calibration and service operations;
- smooth setting of the alarm thresholds within full measurement range
- Automatic compensation for background gamma radiation and contamination of detector units
- Modification RZA-05D-01 with optional detector unit for monitoring of feet

Physical characteristics

Detectors: alpha - scintillatior ZnS(Ag)

Efficiency:

- Pu-239: not less than 20%
- U-234: not less than 14%
- U-238: not less than 8%

Measurement range:

- 0.5 ÷ 10^5 $min^{-1}cm^{-2}$

Energy range:

- 4.1 ÷ 9.0 MeV

Operation temperature range:

- −10 ÷ +50 °C

Electrical characteristics

Power supply:

- 220 V, 50 Hz

Mechanical characteristics

Overall dimensions, weight, no more:

- RZA-05D floor-mounted: 610×1400×840 mm, 48 kg
- RZA-05D wall-mounted: 610×530×410 mm, 25 kg
- RZA-05D-01 hand-foot version: 650x1250x1450 mm, 70 kg

Reference standards: *Nuclear: IEC 61098*

UMF-2000

ALPHA/BETA RADIOMETER

UMF-2000 Detector area 1000 mm²

UMF-2000 Detector area 500 mm²

Low background alpha/beta radiometer with silicon detector. The radiometer is widely used for low level activity measurements by alpha and beta counting. It is recommended for measurement of gross alpha and beta activity in natural and drinking waters

Purpose

- Measurement of gross activity of alpha-emitting radionuclides in thick and thin samples
- Measurement of activity of beta-emitting radionuclides in samples of foodstuffs, soil, water, as well as of filters and samples prepared by the selective radiochemical extraction

Features

- Simultaneous measurement of alpha/beta activities in the sample
- Available options for surface area of the installed detector: 500 or 1000 mm²
- Active anti-coincidence background substraction using gas discharge detectors (GM tubes)
- Passive lead shielding
- Protection from power line disturbances;
- Timer and two channels (alpha, beta) for separate counting of pulses from the detector
- Connection to computer via USB or RS-232
- Measurement of Po-210, Sr-90 in soil and Po-210, Ra-226, Ra-228 in water samples
- SpectraDec software (optional) expands the UMF-2000 functionality with alpha-spectrometric measurements of U, Th, Po, Pu, Am isotopes

Physical characteristics

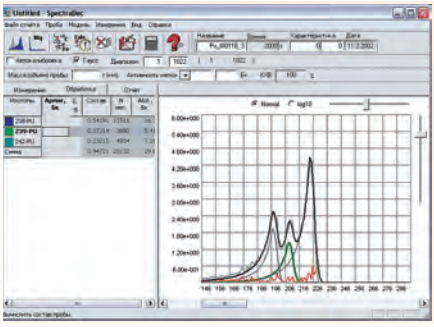
Detectors:

- Silicon specrometric detector 500 or 1000 mm²

Measurement range:

- Alpha: 0.01 ÷ 1000 Bq
- Beta: 0.1 ÷ 3000 Bq

Reference standards: *Nuclear: IEC 60325*



SpectraDec software for alpha-spectrometric measurements

Energy range:

- Alpha: 3.5 ÷ 8.0 MeV
- Beta: 0.05 ÷ 3.5 MeV

Electrical characteristics

Power supply:

- 220 V, 50 Hz

Interfaces:

- RS-232, USB

Mechanical characteristics

Overall dimensions, weight:

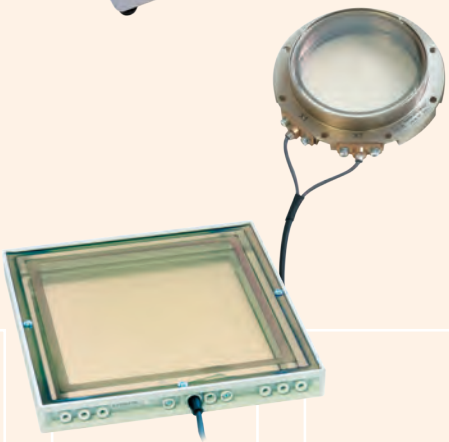
- 321×286×190 mm, 21.6 kg

DRK

DOSE AREA PRODUCT METER

The device is intended for determination of patient doses received during diagnostic radiology procedures

DRK-1



Features

- Takes measurements with allowance of area and filtration of X-ray radiation
- The measurement mode is automatically switched on when X-ray machine reaches operating mode
- Easy installation without specialists involvement and without interference in the X-ray machine design
- Can be used with two ionizing chambers simultaneously, the second ionizing chamber can work both in the summation mode and as a separate measuring channel
- Self-test mode
- Equipped with a device for printing measurements results on a paper tape
- Allows to transmit data to an external information channel and provides access to processed information via communication line with the RS-232 interface

Physical characteristics

Measurement range of the kerma (absorbed dose) in air per area:

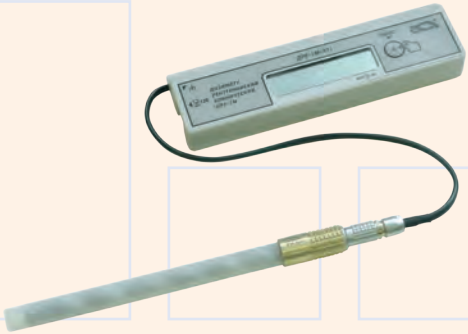
- $1 \div 10^4$ μGy·m^2

The measurement uncertainty of kerma in air per area:

- ± 15 %

Reference standards: *Nuclear: IEC 60580*

DRK-1M-CT



Purpose

DRK-1M-CT is used in computed tomography for measure kerma in air per length at the exit of the X-ray machine with calculation of tomography dose index CTDI (with use of CTDI phantom) in accordance with IEC 60601-2-44 to calculate the effective dose received by the patient and calculate the dose rate of a CT in accordance with IEC 61223-2-6

Physical characteristics

Measurement range:

- 0.5 ÷ 10^9 μGy·m

The measurement uncertainty of kerma in air per area:

- In the range from 0.5 to 10 μGy·m^2: ±25 %
- In the range from 10 to 10^9 μGy·m^2: ±15 %

DRK-1E

Purpose

Calibration of DRK dosimeters

Physical characteristics

Measurement range of the kerma (absorbed dose) in air per area:

- 0.08 ÷ 10^9 μGy·m^2

The measurement uncertainty of kerma in air per area:

- ± 5 %

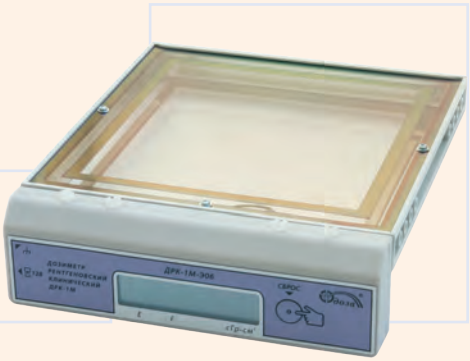
Range of determination of kerma rate in air per area:

- 0.6 ÷ 6·10^4 μGy·m^2/s

The determination uncertainty of kerma rate in air per area:

- ± 5 %

DRK-1M



Purpose

- Measurement of kerma (absorbed dose) in air per the cross-sectional area of the X-ray beam
- NMeasurement of kerma power in air per area

Physical characteristics

Measurement range of the kerma (absorbed dose) in air per area:

- $0.1 \div 10^9$ μGy·m^2

The measurement uncertainty of kerma in air per area:

- ± 15 %

Measurement range of the kerma power in air per area:

- $0.6 \div 6 \cdot 10^4$ μGy·m^2/s

The determination uncertainty of kerma power in air per area:

- ± 15 %

The working range of the anode voltage of the x-ray emitter:

- 20 – 200 kV

Transparency of ionization chambers for visible light in accordance with IEC 60580:

- 70%

Active area of the ion chamber:

- 140 × 140 mm2

Printer interface:

- RS-485

SRPS-05D

GAMMA MONITOR

Easy in use, robust instrument for area and process monitoring in nuclear and radiation facilities. The monitor provides audible and visual alarms whenever the preset threshold is exceeded and controls external devices (for example, door interlocking systems).

- Continuous automatic monitoring of the ambient dose equivalent rate
- Measurement of gamma dose rate H*(10)
- Audible and visual alarm signals for preset thresholds
- Switching on the external signaling or executive devices

Physical characteristics

Detector:
- GM counter

Measurement range:
- 0.1 μSv/h ÷ 2.0 mSv/h

Energy range:
- 0.05 ÷ 3.0 MeV

Threshold setting range:
- 0.3 μSv/h ÷ 2.0 mSv/h

Step change of the threshold:
- In the range 0.3 ÷ 10 μSv/h: 0.01 μSv/h
- In the range 10 ÷ 100 μSv/h: 0.1 μSv/h
- In the range 100 ÷ 2000 μSv/h: 1.0 μSv/h

Electrical characteristics

Power supply:
- 220 V, 50 Hz
- Relay output

Mechanical characteristics

Protection index:
- IP40

Overall dimensions, weight:
- 226×120×75 mm, 0.7 kg

Alarm:
- Sound alarm: 80 ÷ 100 dBA at distance 1 m
- Visual alarm: red
- Connection of the external alarm signaling unit

Reference standards: *Nuclear: IEC 60532*

PVP-06

PORTABLE AIR SAMPLER

Air Sampler PVP-06 is indispensable for monitoring the radiation situation where the concentration of radioactive aerosols in the air does not require a stationary sampling equipment. Sampling head PVP-06 provides easy change of filters and cartridges

Purpose

- Air sampling for the purpose of determination of radioactive gas and aerosol content

Controlled aerosols:

- Alpha- and beta-active aerosols
- Daughter products of decay of radon and thoron
- Iodine isotopes

Features

- User specified flow rate or total air volume to be sampled
- Indication of battery condition
- Indication of flow meter condition
- Automatic measurement of the sampled air volume with indication of the result
- The battery charging time does not exceed 4-5 hours
- Low noise level

Physical characteristics

Types of filters:

- Aerosol AFA-RSP-20
- Lodine AFA SI-20
- Other paper filters Ø 5 cm

Flow rate:

- 20 ÷ 140 l/min
- Total volume measurement range:
- 20 ÷ 100 000 l

Electrical characteristics

Power supply:

- 220 V/50 Hz
- Car charger: 12 V
- Internal battery

Continuous operation time:

- from the battery: 12 hours
- from the external power supply: 24 hours
- Power consumption (at a flow rate of 100 l/min):
- 40 VA

Environment characteristics

Operating temperature:

- −10 ÷ +40 °C

Maximum humidity:

- 98%

Pressure:

- 84 to 106,7 kPA

Mechanical characteristics

Dimensions, weight:

- 245×110×165 mm, 3 kg

Case material:

- Plastic

Basic set

- Air sampler PVP-06
- AC power adapter
- Filters AFA-RSP-20 - 100 pcs.
- Packaging for filters - 40 pcs.
- Case

Optional equimpient:

- Kit for sampling sorption columns of activated carbon
- Car charger
- Tipod
- Calibration stand

Consumables

- Aerosol filters AFA RSP-20
- Iodine filters AFA SI-20

IPV-01D

PERSONAL AEROSOL SAMPLER

The first certified sampler in Russia for continuous air monitoring in the breathing zone of personnel.

IPV-01D is designed for collection of the dispersed phase particles from gas-aerosol mixture in the personnel's breathing zone at AFA RSP-10 filter in order to determine its radioactivity

Purpose

- Measurement of the total volume of pumped gas-aerosol mixtures
- Monitoring of activity inhaled by personnel exposed to radioactive aerosols

Features

- Comfort in wearing and working
- Measured volume can be zeroed only with the access key
- Built-in wireless module for configuration and diagnostics using PC

Physical characteristics

Flow rate of gas-aerosol mixtures:

- 1 ÷ 2 l/min

Measurement range of the pumped volume:

- 0.001 ÷ 10 m^3

Limits of the basic relative error of the pumped volume measurements:

- ±10 %

Continuous operation time on built-in batteries:

- Not less than 10 h

Environment characteristics

Operating temperature range:

- −10 ÷ +40 °C

Mechanical characteristics:

Overall dimensions, weight:

- Pump unit: 162×104×45 mm, 0.68 kg
- Filter holder: Ø 80×40 mm, 0.12 kg

“ALPHARAD PLUS”

RADON, THORON & THEIR PROGENY MONITOR

- Measurement of radon and thoron concentration and effective equivalent concentration (EEC):
  - In the air
  - In the indoor air of residential, public and industrial buildings and structures
- Measurement of radon in drinking water sources
- Measurements of radon flux from the soil surface at land plots allocated for construction of houses, public buildings and industrial facilities
- Measurements of radon concentration in soil air

Physical characteristics

Detector:

- Silicon

Measurement range:

EEC measurement:

- Measurement range of radon EEC: 1.0 ÷ 1.0·10^{6} Bq·m^{-3}
- Measurement range of thoron EEC: 0.5 ÷ 1.0·10^{4} Bq·m^{-3}
- Air flow through the filter: 10.0 ± 0.5 l/min

Concentration measurement:

- Measurement range of radon-222 concentration in air: 1.0 ÷ 2.0·10^{6} cps
- Measurement range of 216Po(ThA): 1·10^{-3} ÷ 1·10^{2} cps
- Air sampler flow rate: 1.0 ± 0.2 l/min
- Measurement range of radon-222 concentration in water samples: 6 ÷ 800 Bq·kg^{-1}
- Measurement range of radon-222 flux from soil surface: 20 ÷ 10^{3} mBq/s·m^{2}
- Measurement range of radon-222 concentration with preliminary sampling of air using air samplers: 20 ÷ 10^{7} Bq·m^{-3}
- Measurement range of radon-222 concentration in samples of soil air 10^{3} ÷ 10^{6} Bq·m^{-3}

Environment characteristics:

Operation temperature range:

- 0 ÷ +50 ºC

Humidty:

- 10 ÷ 95 %

Electrical characteristics

Power supply:

- 8.0 VA

Continuous operation time (till recharging):

- 6 hours

Mechanical characteristics

Overall dimensions, weight:

- 220×200×165 mm, 3.6 kg

Reference standards: *Nuclear: IEC: 61577*

UCRV-2
AIRFLOW MONITOR

The UCRV-2 airflow monitor is designed for automated control of the air flow through a filter at facilities with centralized multichannel air sampling system from working places and ventilation ducts, including the nuclear fuel production plants and nuclear power plants

Features

- Monitoring of the air flow through filter of centralized multichannel sampling system
- Radiation monitoring system (RMS) integration for internal exposures determination
- Volume and flow rate measurements of the air that have passed through the analytical filter
- Bar-code for filter identification
- Operation as either standalone unit or as a part of the RMS
- LCD screen for information output
- Automated and manual control of the external execution module (valve, stop-cock)
- Transmission to the network of the information including the device status, measured flow rate and total air volume passed through the filter
- Access to the information using interface RS-485

Physical characteristics

Measurement range of the pumped air volume:

- 0,01 ÷ 9999 m^3

Measurement range of air flow:

15 ÷ 100 l/min

Operation temperature range:

- −20 ÷ +50 °C

Protection index:

- IP65

Electrical characteristics

Power supply:

- 220 V, 50 Hz

Interface:

- RS-485

Contents

Radiation monitoring system

"PELIKAN": Radiation monitoring system (RMS) 6
BDMG-101: High range gamma area monitor 10
DBG-S11D: Wide range gamma area monitor 11
BDRG-52: High range gamma area monitor for accident and post-accident conditions 12
UDMN-100: Neutron area monitor 13
UDKG-100: Wel Liquid gamma monitor 13
UDGP-01: Liquid / technological environments monitor 14
UDGP-01: Steam generator leakage monitor 15
UDA-1AB: Particulate monitor 16
UDG-1B: Noble gas monitor 17
UDG-03D: Noble gas monitor 18
UDI-1B: Iodine monitor 19
UDGB-01: Noble gases/H-3/C-14 monitor 20
BOP-1M: Data processing and transmission unit 21
UPPVM: Air flow parameters monitor 22
"IMPULS": External display unit 23
BI-2: Remote display & alarm unit 24
BAS/BAS-1s: External alarm 25
SKGAV: Stack monitor 26
RMS SOFTWARE 28
RMS WORKSTATION – OPERATOR CONSOLE 29
CONFIGURATOR SOFTWARE 29
RM RACK: Radiation monitoring rack 30
SRKS-01D: Criticality accident alarm system 32
"ATLANT-M": Environmental radiation monitoring system 34
"BREEZE": High-volume air sampler 35
"GAMMA-SENSOR": Gamma-survey system 36

Radiation monitoring equipment

AREA MONITOR "FREGAT" 38

BPI-1D: Local display unit 39
DETECTOR UNITS:
DBG-S11D: Wide range gamma area monitor 40
UDKS-100: Gamma and X-ray area monitor 41
UDMN-100: Neutron area monitor 41
ALARM UNITS:
BAS-2 "MICRO": External visual alarm 42
BZS-2 "Micro": External audible alarm 42
ILLUMINATED WARNING SIGNS 43
"IMPULS": External display unit 43
UIM-D: Radiation area / contamination monitor 44
UIM-3D: Display unit 44
DKG-09D: Highly sensitive gamma radiation dosimeter 46
MKS-17D: Dosimeter-radiometer 47
DKG-05D: Personal gamma dosimeter 48
DVS-02D: Personal gamma-neutron dosimeter 50
IRAA–01D: Threshold alarm unit for radioactive aerosols 52
DKG-02U: "ARBITER": Wide range gamma-dosimeter 53
DKG-07D: "DROZD": Gamma-dosimeter 54
MKS-15D: "SNEGIR": Multi-purpose radiation survey meter 55
DOZA-TLD: Multipurpose TLD system 56
DKS-96: Dosimeter / radiometer 58
EXTERNAL PROBES ALPHA:
Alpha: BDZA-96 60
Alpha: BDZA-96b 60
Alpha: BDZA-96m 60
Alpha: BDZA-96s 60
Alpha: BDZA-96t 61
EXTERNAL PROBES BETA:
Beta: BDZB-96 61
Beta: BDZB-99 61
Beta: BDZB-96b 61
Beta: BDZB-96s 62
Alpha and Beta: BDPS-96 62
EXTERNAL PROBES GAMMA:
Gamma: BDKS-96b 62
Gamma and beta: BDKS-96s 63

Gamma: BDMG-96 63
Gamma: BDKG-96 63
Gamma-search: BDVG-96 64
Gamma-search: BDPG-96 64
Gamma-search: BDPG-96m 64
EXTERNAL PROBES NEUTRON:
Neutron: BDMN-96 65
Neutron-search: BDKN-96 65
RZB-07D: Hand-foot-clothing monitor 66
RZBA-04-04M: Whole body contamination monitor 67
RZA-05D: Alpha hand-monitor 68
UMF-2000: Alpha / beta radiometer 69
DRK: Dose area product meter 70
DRK-1 70
DRK-1M-CT 71
DRK-1E 71
DRK-1M 72
SRPS-05D: Gamma monitor 73
PVP-06: Portable air sampler 74
IPV-01D: Personal aerosol sampler 75
"ALPHARAD PLUS": Radon, thoron & their progeny monitor 76
UCRV-2: Airflow monitor 77

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