

DOSIMETRY AND RADIOMETRY



- GAMMA RADIATION DETECTING DEVICES
- NEUTRON RADIATION DETECTING DEVICES
- BETA RADIATION DETECTING DEVICES
- LOCAL CONTROLLER UNITS
- POWER SUPPLY AND SWITCHING UNIT
- ALARM UNIT
- BETA CONTAMINATION CONTROL SYSTEM
- INTEGRATED RADIATION CONTROL EQUIPMENT
- UNIVERSAL HAND-HELD RADIATION MONITOR
- CONTAMINATION PROBE
- NEUTRON SEARCH DETECTOR
- CONTRABAND DETECTOR

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Research International, Inc. is an exclusive distributor for Aspect products.

Contact:

Research International, Inc.
17161 Beaton Road SE Monroe, Washington 98272 USA

Phone: 1-360-805-4930 • Fax: 1-360-863-0439 • Toll Free: 1-800-927-7831
Email: info@resrchintl.com Web: <http://www.resrchintl.com>

DEVELOPMENT AND PRODUCTION OF RADIATION CONTROL EQUIPMENT

*Research International, Inc. • 17161 Beaton Road SE, Monroe, Washington 98272-1034 USA
Phone: 1-360-805-4930 • Fax: 1-360-863-0439 • Toll Free: 1-800-927-7831
Email: info@resrchintl.com • Web: <http://www.resrchintl.com>*

PURPOSE

The dosimetric and radiometric equipment in this brochure are intended for radiation control at nuclear facilities, nuclear enterprises, and for environmental radiation monitoring.

COMPONENTS

The systems consist of network units for detection of alpha, beta, gamma and neutron radiation, as well as stand-alone radiometric and dosimetric devices. Special software allows the user to collect data from geographically-distributed detectors as in the integrated radiation control system SKRO-01A.

CERTIFICATION

The integrated radiation control system SKRO-01A is listed in the Russian State Committee of Standards under No12607 of 09.07.02 and in the Russian State Register of Measuring Devices under No 23155-02.



UDBG

GAMMA DETECTOR

PURPOSE

Measurement of the gamma radiation equivalent dose rate.

APPLICATION

As a part of the radiation control system at a nuclear power plant, nuclear cycle facility, or radiological laboratory.

FEATURES

- Functionally completed network-integrable device
- Nonvolatile archive (up to 240 measurements)
- Alarm control unit
- Self-diagnostics

Modification	Purpose	Complete set
UDBG-01	• Measurement of photon radiation EDR • Storage of measured data in the detector archive • Two-level visual and sound alarm • Connection of additional detector	• BDG-02* gamma detector • BK-01 switching unit • BS-01 alarm unit • Bracket
UDBG-01-01	• Measurement of photon radiation EDR • Storage of measured data in the detector archive • One-level visual and sound alarm • Connection of additional detector	• BDG-02-01* gamma detector • BK-02 switching unit • Bracket
UDBG-01-02	• Measurement of photon radiation EDR • Storage of measured data in the detector archive	• BDG-02* gamma detector • Bracket
UDBG-01-03	• Measurement of photon radiation EDR • Storage of measured data in the detector archive • Connection of additional detector	• BDG-02* gamma detector • BK-02 switching unit • Bracket
UDBG-04	• Measurement of photon radiation EDR • Storage of measured data in the detector archive • Two-level visual and sound alarm • Connection of additional detector	• BSCh-01 counter unit • BKK-01 control and switching unit (with alarm) • Cable, 50m • Bracket
UDBG-04-01	• Measurement of photon radiation EDR • Storage of measured data in the detector archive • Connection of additional detector	• BSCh-01 counter unit • BKK-01-01 control and switching unit • Cable, 50m • Bracket

TECHNICAL DATA OF UDBG-01, UDBG-01-01, UDBG-01-02, UDBG-01-03

Detector	GM counter
EDR measurement range, $\mu\text{Sv/h}$	0.1 - 10^5
Detected energy range, MeV	0.06 – 1.5
Energy dependence of sensitivity relative to the energy 0.662 MeV (Cs-137), %	± 25
Tolerable basic relative error of EDR measurements, %	± 20
Protection class	IP65
Operating temperatures, °C	-40...50
Power voltage, V	9 – 18
Interface	RS-485
Protocol	MODBUS

OVERALL DIMENSIONS AND WEIGHT

	UDBG-01	UDBG-01-01	UDBG-01-02	UDBG-01-03
Overall dimensions, mm	155x162x515	155x162x393	155x114x264	155x162x264
Weight, kg	4.8	2.8	1.86	2.46
				

*BDG-02 detector can be supplied separately

TECHNICAL DATA OF UDBG-04, UDBG-04-01

Detector	GM counter
EDR measurement range, $\mu\text{Sv/h}$	$0.1 - 10^7$
Detected energy range, MeV	0.06 – 1.5
Energy dependence of sensitivity relative to the energy 0.662 MeV (Cs-137), %	± 25
Tolerable basic relative error of EDR measurements, %	± 20
Protection class	IP65
Operating temperatures, °C	-40...50
Power supply, V, mA	9 – 18, 50
Interface	RS-485
Protocol	MODBUS

OVERALL DIMENSIONS AND WEIGHT

	UDBG-04		UDBG-04-01	
Overall dimensions, mm	114x195x155	220x120x137	114x195x155	220x120x81
Weight, kg	0.7	4	0.7	3.5
				

UDBN

NEUTRON DETECTOR

PURPOSE

Measurement of neutron radiation equivalent dose rate.

APPLICATION

As part of a radiation control system at a nuclear power plant, nuclear cycle facility or radiological laboratory.

FEATURES

- Functionally completed network-integrable device
- Nonvolatile archive (up to 200 measurements)
- Alarm control unit
- Data transfer and access to the parameters of the detecting unit via the RS-485 channel



Modification	Purpose	Complete set
UDBN-01	• Measurement of neutron radiation EDR • Storage of measured data in the detector archive • Two-level visual and sound alarm • Connection of additional detector	• BDN-01 neutron detector • BK-01 switching unit • BS-01 alarm unit • Bracket
UDBN-01-01	• Measurement of neutron radiation EDR • Storage of measured data in the detector archive • Two-level visual and sound alarm • Connection of additional detector	• BDN-01 neutron detector • BK-02 switching unit • Bracket
UDBN-01-02	• Measurement of neutron radiation EDR • Storage of measured data in the detector archive	• BDN-01 neutron detector • Bracket

TECHNICAL DATA OF BDN-01

EDR measurement range, $\mu\text{Sv/h}$	0.1 - 10 ⁴
Detected energy range, MeV	10 ⁻³ - 14
Sensitivity against Pu- α -Be, (pulse/s)/($\mu\text{Sv/h}$)	0.4
Tolerable basic relative error of EDR measurements, %	± 30
Operating temperatures, °C	-40...50
Protection class	IP65
Power supply, V, mA	9 – 18, 50

OVERALL DIMENSIONS AND WEIGHT

	UDBN-01	UDBN-01-01	UDBN-01-02	BDN-01
Overall dimensions, mm	337x300x741	337x300x460	337x300x460	402x $\varnothing$ 300
Weight, kg	21.7	19.4	18.6	16.5

UDBB

BETA DETECTOR

PURPOSE

Measurement of beta flux density.

APPLICATION

As part of the radiation control system at a nuclear power plant, nuclear cycle facility or radiological laboratory.



FEATURES

- Functionally completed network integratable device
- Gamma background compensation
- Nonvolatile archive (up to 200 measurements)
- Alarm control unit
- Data transfer and access to the parameters of the detecting unit via the RS-485 channel

Modification	Purpose	Complete set
UDBB-01	• Measurement of beta flux density • Storage of measured data in the detector archive	• BDB-01 beta detector* • Bracket
UDBB-01-01	• Measurement of beta flux density • Storage of measured data in the detector archive • Connection of additional detector	• BDB-01 beta detector* • BK-02 switching unit • Bracket
UDBB-01-02	• Measurement of beta flux density • Storage of measured data in the detector archive • Connection of additional detector • Two-level sound and visual alarm	• BDB-01 beta detector* • BK-01 switching unit • BS-01 alarm unit • Bracket

TECHNICAL DATA OF BDB-01

Beta flux density measurement range, $\text{min}^{-1}\cdot\text{cm}^{-2}$	10–1x10 ⁴
Detected energy range, MeV	0.15 – 3.5
Sensitivity against Sr-90 + Y-90, pulse cm^2	0.5
Gamma background compensation, $\mu\text{Sv/h}$	5
Tolerable basic relative error of measurements, %	±20
Operating temperatures, °C	5...50
Protection class	IP52
Power supply, V	9 – 18
Interface	RS-485
Protocol	MODBUS

OVERALL DIMENSIONS AND WEIGHT OF DETECTING UNIT BDB-01

Overall dimensions, mm	230x155x106
Weight, kg	1.5

OVERALL DIMENSIONS AND WEIGHT

	UDBB-01	UDBB-01-01	UDBB-01-02
Overall dimensions, mm	270x161x406	270x181x406	270x181x670
Weight, kg	3.2	3.8	6.0
			

*BDB-01 detector unit can be supplied separately

UK-01 CALIBRATION DEVICE

PURPOSE

Calibration of BDG-02, UDBG-04.

APPLICATION

As part of the radiation control system at a nuclear power plant, nuclear cycle facility, or radiological laboratory.

TECHNICAL DATA

The gamma radiation EDR with a Cs-137 calibration source of activity 10^6 Bq on the side surface of the UK does not exceed

0.3 μ Sv/h.

A Cs-137 source is supplied upon the request of the customer.



OVERALL DIMENSIONS AND WEIGHT

Overall dimensions, mm	167 x 172 x 260
Weight, kg	26

BLK

LOCAL CONTROLLER UNITS

PURPOSE

- Distributed radiation control station with neutron, gamma and beta detector (BLK-01)
- Local radiation control station with neutron, gamma and beta detector (BLK-01-01)

APPLICATION

BLK is a part of the SKRO-01A integrated system

FEATURES

- Functionally completed network-integrable device
- Nonvolatile archive of up to 2000 measurements (for BLK-01)
- Alarm control unit
- Transfer of data and access to the detecting unit parameters via the RS-485 channel

	BLK-01	BLK-01-01
Number of connected detector via the communication line on the basis of the RS-485 interface	8	2
Constant voltage supply for all connected detector	+	+
Possibility of integrating the controller into the network	+	-/+
Operating temperatures, °C	5...50	
Protection class	IP65	
Power voltage, V, Hz	220, 50	
Overall dimensions, mm	300x283x166	300x283x166
Weight, kg	6.25	6.15



BPK

POWER SUPPLY AND SWITCHING UNITS

PURPOSE

- Power supply and switching of gamma, beta and neutron detectors
- Matching of RS-485 and RS-232C interface signals (only for the unit BPK-02)
- Communication of detector connected to the BPK-02 unit (BPK-03) and an external computer

APPLICATION

As part of the radiation control system at a nuclear power plant, nuclear cycle facility, or radiological laboratory.

TECHNICAL DATA

	BPK-03	BPK-02
Operating temperatures, °C	-40...50	5...50
Protection class	IP65	
Input voltage, V, Hz	176 – 242, 50	
Output voltage, V, A	15, 1	15, 2
Overall dimensions, mm	280x257x127	232x229x127
Weight, kg	3.64	2.81



BS-01

ALARM UNIT

PURPOSE

Visual and sound alarm

APPLICATION

As part of the radiation control system at a nuclear power plant, nuclear cycle facility, or radiological laboratory.

TECHNICAL DATA

Input voltage range, V	9 -18
Sound alarm, dB	90
Visual alarm	Green, red
Operating temperatures, °C	-40...50
Protection class	IP65
Overall dimensions, mm	120x246x137
Weight, kg	0.82



RZB-01A

BETA CONTAMINATION CONTROL SYSTEM

PURPOSE

Monitoring and control of personnel for contamination with beta-emitting radionuclides.

APPLICATION

Nuclear power plant, nuclear cycle facilities or radiological laboratories.

COMPLETE SET

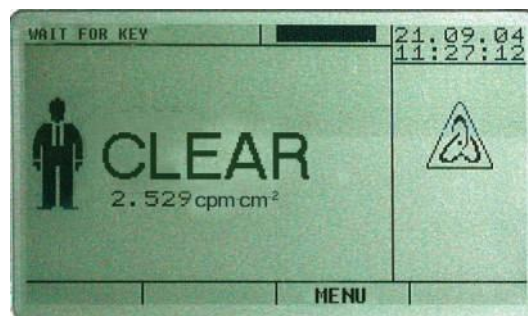
- BLK-03 – display of measurement results
- BDB-01-01 – hand and body contamination control
- BDB-05 – boot contamination control
- Cable, 2 items

FEATURES

- Automatic gamma-background suppression to the EDR values of 5 $\mu\text{Sv/h}$
- Indication of measurement results
- Identification of the staff by individual “keys” iButton® and storage of the checking results
- Transfer of data to the data acquisition control panel
- Visual and audible indication of the threshold value excess

TECHNICAL DATA

Detector	GM counter
Measured beta radiation energies, MeV	0.15 – 3.5
Measured beta particle flux densities, $\text{min}^{-1} \cdot \text{cm}^{-1}$	$10 - 10^4$
Protection	IP52
Operating temperatures, °C	5 ... 50
Measurement error, %	± 20



SKRO-01A

INTEGRATED RADIATION CONTROL SYSTEM

COMPLETE SET

The SKRO-01A system comes complete with the devices listed below and can be extended and modified as needed for a particular application.

The integrated system can include the following devices:

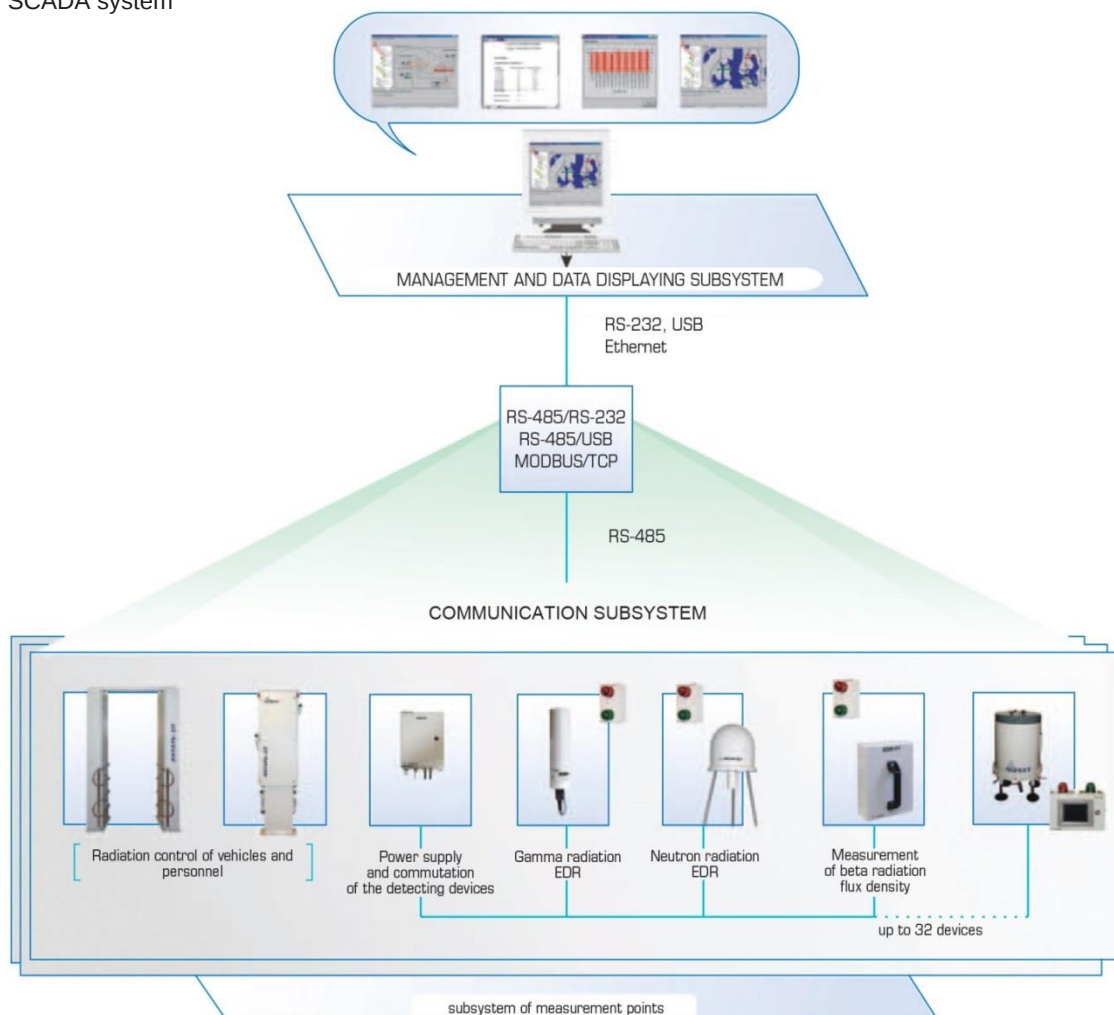
- Yantar radiation monitors to monitor vehicles and personnel
- Radiometer-spectrometer RSKV-01 to monitor piped fluids
- Units and devices of other manufacturers

MANAGEMENT AND DATA DISPLAYING SUBSYSTEM

- Automated data collection from the integrated system devices
- Display of current measurement results, map
- Display of archived data
- Information about alarm triggering at any device
- Setting of the devices parameters

The following devices can be used as a part of the subsystem:

- Specialized computers of the PVC-01 or BLK-01 type
- PC with software of the Yantar Control type
- SCADA system



SKRO-01A INTEGRATED RADIATION CONTROL EQUIPMENT

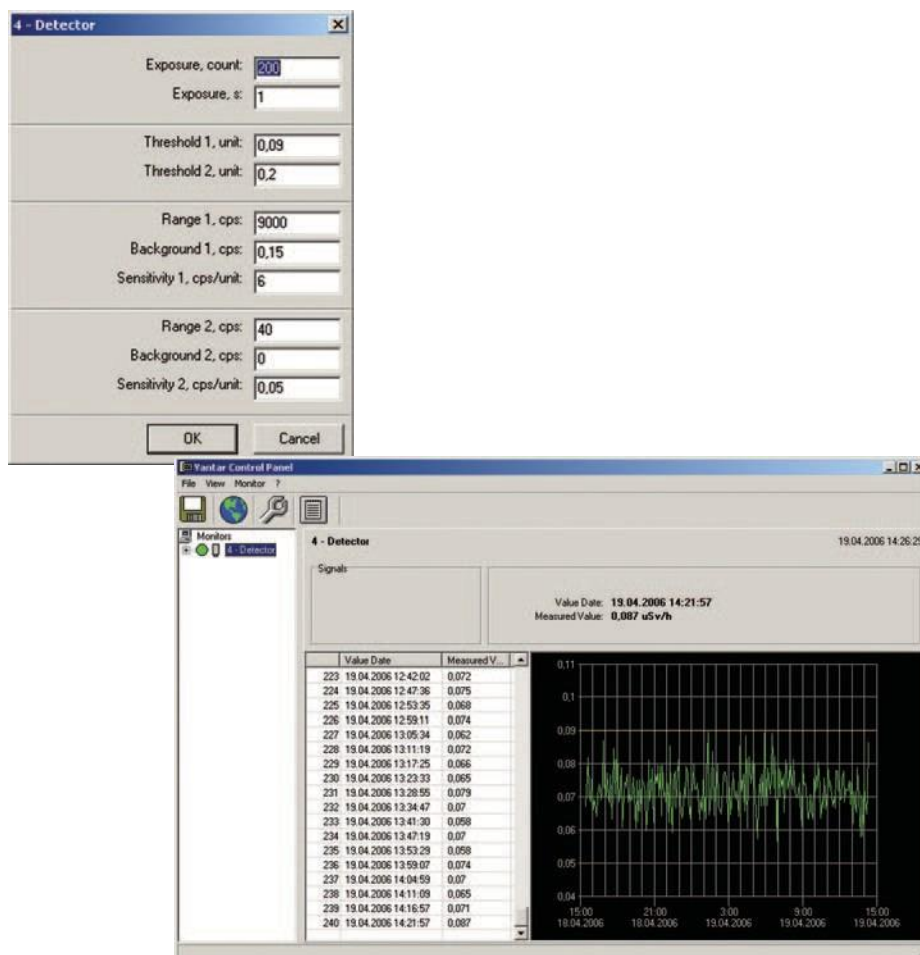
COMMUNICATION SUBSYSTEM

The communication Subsystem provides data transfer from the detector subsystems to the management and data displaying subsystem.

MEASUREMENT POINTS SUBSYSTEM

This subsystem provides measurement of the ambient equivalent dose rate of gamma-neutron radiation; volume activity of aerosols in the air; beta surface contamination; collecting, primary processing and storage of monitored parameters; local alarm; radiation control of vehicles and personnel; and data exchange with the management and data displaying subsystem by way of the communication subsystem (see figure on preceding page).

Up to 247 different devices can be connected.



MKC-05A

UNIVERSAL HAND-HELD RADIATION MONITOR

PURPOSE

- Detection and localization of radioactive sources
- Quantitative measurement of gamma, beta, and neutron radiation
- Storage of measured values
- Location information with built-in GPS module option
- Measurement of spatial distribution of gamma, beta and neutron radiation field intensity In case of supply with a
- Built-in radio modem option provides an immediate data transfer to the data acquisition center



APPLICATION

Radiation control at atomic facilities, field surveys of all types, mobile radiological laboratories, customs checkpoints, radiation control services, etc.

MKC-05A performs the following functions:

- measurement of the operator's accumulated gamma radiation dose
- measurement of the gamma radiation equivalent dose rate (EDR)
- measurement of beta particle flux density
- measurement of the neutron radiation EDR
- search (detection and localization) for radioactive materials by detecting photon, neutron, and beta radiation
- display of the measured data
- accumulation, storage of the measured data, and their transfer to the PC
- geographical reference of measured data (optional)
- radio transmission of the measured data as far as 2 km (optional)

MODIFICATIONS

	MKC-05A	MKC-05A-01	MKC-05A-02	MKC-05A-03	MKC-05A-04	MKC-05A-05
Built-in detector	Y	Y	Y	Y	Y	Y
External detectors	γ , β , n	γ , β	γ	γ , β , n	γ , β	γ
Built-in GPS module	+	+	+	-	-	-
Wireless communication with the computer	+	+	+	-	-	-
Weight, kg	9.5	3.3	2.4	9.3	3.1	2.2

SYMBOLS: γ - gamma detector; β - beta detector; n – neutron detector

Data exchange with the computer is possible through the RS-232 serial channel.

A distinctive feature of the MKC-A05 is the iButton® key, which is used as an independent information carrier and allows authorizing access to information, keeping records of individual doses for each operator, and transmitting accumulated data to the computer.

The device is powered by built-in storage batteries. The time of continuous operation on battery power is no less than twelve hours.

TECHNICAL DATA

BDG-03 Gamma radiation detector

EDR measurement range, $\mu\text{Sv/h}$	0.1–10 ⁵ (0.1–10 ⁷ optional)
Detected energy range, MeV	0.06–1.5
Tolerable basic relative error, %	$\pm [30 + 3/H^*(10)]$
Protection class	IP65
Weight, g	800

BDN-06 Neutron radiation detector

EDR measurement range, $\mu\text{Sv/h}$	1–10000
Detected neutron energy range, MeV	10 ⁻³ – 14
Tolerable basic relative error, %	$\pm [30 + 20/H^*(10)]$
Protection class	IP65
Weight, kg	6.2

**against the Pu- α -Be source in collimated radiation*

BDB-03 Beta radiation detector

Beta flux density measurement range, $\text{min}^{-1}\cdot\text{cm}^{-2}$	10–10 ⁴
Detectable end-point beta energy range, MeV	0.15–3.5
Protection class	IP52
Weight, g	900
Tolerable basic relative error, %	$\pm(30 + 200/\varphi)$

NOTE: $H^*(10)$ is the measured EDR value in $\mu\text{Sv/h}$

CERTIFICATES

The device is listed in the Russian State Committee of Standards under No 18382 of 04.07.2004 and in the Russian State Register of Measuring Devices under No.27511 – 04

IRS-02A CONTAMINATION PROBE

PURPOSE

Checking of cash for radioactive contamination.

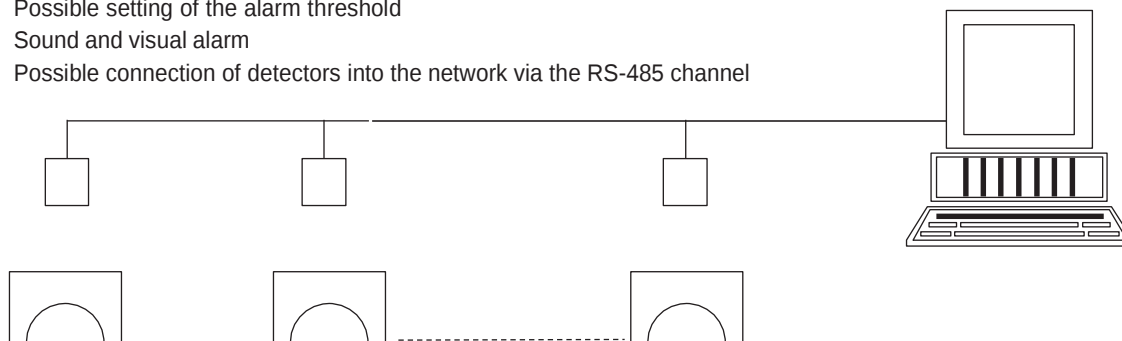
APPLICATION

Banks and offices. The device is mounted on the desk of the cashier-operator.



FEATURES

- Type of radiation: gamma, beta
- Possible setting of the alarm threshold
- Sound and visual alarm
- Possible connection of detectors into the network via the RS-485 channel



TECHNICAL DATA

Beta flux density measurement range, $\text{min}^{-1} \cdot \text{cm}^{-1}$	10–10 ⁴
Detected beta radiation energy range, MeV	0.15 – 3.5
Detected gamma radiation energy range, MeV	0.06 – 1.5
Sensitivity against Sr-90 + Y-90, pulse/cm ²	0.5
Sensitivity against Cs-137, (pulse/s)/($\mu\text{Sv/h}$)	1.0
Overall dimensions, mm	220x145x85
Weight, kg	3

MKC-A03

HAND-HELD RADIATION MONITOR

PURPOSE

- Search for radioactive sources (α , β , γ , n)
- Measurement of dose rates (γ, n)
- Measurement of flux density (α , β)
- Identification of radionuclides (γ)

DETECTORS

- Gamma detectors: NaI(Tl), GM counter
- Neutron detector: ^3He counter
- BDS-AB2 External alpha-beta detector
- BDN-06-01 External wide-wave neutron detector (upon request)

APPLICATION

Control of nuclear and radioactive material trafficking, monitoring of areas.

Can be used in mobile radiological laboratories, at customs checking points, nuclear facilities, military sites, nuclear power plants, etc.

FEATURES

- Comprehensive software for radionuclide identification
- Wide range of gamma radiation EDR measurements
- Operation of all functions with five buttons
- High resistance to mechanical damage
- Convenient connection with PC
- Wireless data transfer
- Automatic energy calibration during battery charging
- Neutron EDR measurements in a wide energy range with the external detector

OPERATING CONDITIONS

Protection class	IP54
Operating temperature, °C	-20...+50

**In case the instrument is equipped with the external neutron detector, its model name is supplemented with N letter, eg MKC-A03-1N.*

MODIFICATIONS IN ACCORDANCE WITH THE TYPES OF MEASURED RADIATION

MKC-A03-1	α , β , γ , n
MKC-A03-2	α , β , γ
MKC-A03-3	γ , n
MKC-A03-4	γ

OPERATION MODES

SURVEY

- search for gamma and neutron radiation

Detection at the distance of 0.2 m, at the device speed of 0.5 m/s:	
Gamma-radiation sources	
Ba-133 with	55 kBq
Cs-137 with	100 kBq
Co-60 with activity	50 kBq
Neutron radiation sources	
Cf-252 with flux density	$6.0 \times 10^3 \text{ s}^{-1}$



DOSIMETRY AND RADIOMETRY

- Measurement of the equivalent dose rate
- Measurement of alpha and beta radiation flux density

Type of radiation	Quantity Measured	Measurement range	Energy range of radiation measured or nuclide	Basic error, %
Gamma	EDR, $\mu\text{Sv/h}$	$0.1 - 10^2$ $10^2 - 10^4$	0.05 – 3 MeV	± 20 ± 30
Neutron (built-in detector)	EDR, $\mu\text{Sv/h}$	$1 - 10^3$	Pu-Be source	± 40
Neutron (detector BDN-06-01)	EDR, $\mu\text{Sv/h}$	$1 - 10^4$	$10^{-3} - 14$ MeV	± 30
Alpha	Flux density, $\text{cm}^{-2} \text{min}^{-1}$	$1 - 10$ $10 - 5 \times 10^3$	3 – 10 MeV	± 40 ± 20
Beta	Flux density, $\text{cm}^{-2} \text{min}^{-1}$	$2 - 2 \times 10$ $2 \times 10 - 5 \times 10^3$	0.3 – 3 MeV max. values of beta-spectrum energies	± 40 ± 20

SPECTROMETER

- Measurement of gamma spectra
- Identification of gamma-radiation sources
- Transfer of spectra to the computer

IAEA recommended built-in library of nuclides with identification of isotopes by types: special, medical, industrial, natural	
storage of up to 1000 measured spectra, data communication with PC through RS-232, Bluetooth (upon request)	
detected gamma radiation energies, MeV	0.05 – 3
dimensions of NaI(Tl) scintillator crystal, mm	$\varnothing 40 \times 40$
relative energy resolution, %	7.5
maximum input load, s^{-1}	5×10^4
temporary instability, %	1
temperature instability, $\%/^{\circ}\text{C}$, typical value	0.04

OVERALL DIMENSIONS, WEIGHT

	Overall dimensions, mm	Weight, kg
MKC-A03	280x130x181	3
Power supply adapter	60x160x40	0.5
BDS-AB2	350x160x89	1
BDN-06-1	232x232x282	6.1
Docking station	299x138x92	1,1

CERTIFICATES

The device is listed in the Russian State Committee of Standards under No19945 of 04.03.2005 and in the Russian State Register of Measuring Devices under No 17406 – 05

NSD-A03

NEUTRON SEARCH DETECTOR

PURPOSE

- Search for neutron sources
- Search for Pu contamination
- Inspection of nuclear waste
- Monitoring of neutron radiation fields

DETECTORS

- Neutron detector: 6 ^3He counters in polyethylene moderator
- Gamma detector: GM counter

APPLICATION

The major application area is the control for illicit trafficking of nuclear materials. The device can be used at customs checkpoints, airports, special processes, etc.

BASIC DATA

Absolute neutron efficiency of the detector (for fission spectrum), $\text{s}^{-1}\text{cm}^{-2}$	20
False alarm rate, per 10 min	1
Dust and moisture protection	IP54
Operating temperatures, $^{\circ}\text{C}$	-20 ...50
Continuous operation, h	16
Weight, kg	3.2
Overall dimensions, mm	280 x130 x126



FEATURES

- Advanced functions to search for and localize radiation sources
- Measurement of gamma radiation EDR to ensure safety of personnel
- Operation of all functions with five buttons
- High environmental stability

MAIN OPERATION MODES

SEARCH

Search for neutron sources by comparing the current counting rate of the neutron detector with the threshold value, taking statistical significance into consideration

Characteristics:

Detection, at the distance 1m on the move at the speed 0.5 m/s of a Cf-252 neutron source with the neutron flux, s^{-1}	1.5×10^4
Detection, at the distance 1m and exposure for 5 s, of a weapon grade Pu sample with the weight, g	100

DOSE RATE

Measurement of gamma and neutron EDR

Characteristics:

Radiation type	Measure d	Measurement range	Energy range of measured radiation, or	Basic error, %
Neutron	EDR, $\mu\text{Sv/h}$	$1 - 10^3$	Pu-Be source	± 40
Gamma	EDR, $\mu\text{Sv/h}$	$1 - 10^4$	0.03 – 1.5 MeV	± 30

Search for and localization of neutron sources with light and sound indication at frequencies proportionate to radiation intensity.

SERVICE FUNCTIONS

- Timer/counter mode
- Set up of measurement parameters
- Storage of measurement results in NVRAM
- Data exchange with PC

DIP-A01M

CONTRABAND DETECTOR

PURPOSE

The instrument serves to detect smuggled items (weapon, explosives, drugs, foreign currency), hidden behind panels, partitions, or within closed spaces.

APPLICATION

At the security and customs inspection services

OPERATION

Operation of the instrument is based on gamma radiation back scattering. Radiation from the source penetrates the object under inspection (through the casing, packing material, partition, etc.) and scatters. Part of the scattered radiation is registered by the detector in the instrument. The intensity of the registered radiation depends on the presence of a scattering item and its properties (average density of scanned space). Intensity variations of the registered scattered radiation, whose relative values are displayed, allows judging the variations in the density of the object. Density variation in the places where it should be invariable is the sign that there are smuggled items or hidden spaces in the search area.



TECHNICAL DATA

Radionuclide activity, MBq	1 – 0.1
Type of detector	NaI(Tl)
Scanning depth, mm	Up to 300
Power supply	3 AA size rechargeable batteries
Continuous operation time, h	20
Overall dimensions, mm	230x100x60
Weight, kg	1.1

FEATURES

- Small size, hand-held type
- Ba-133 gamma radiation source
- Two control pushbuttons
- Automatic backlighting of display
- Sound indication
- Possibility of using headphones in noisy environment

COMPLETE SET

- DIP-A01M with a set of rechargeable batteries
- Charger
- Carrying bag
- Headphones
- Instruction manual

