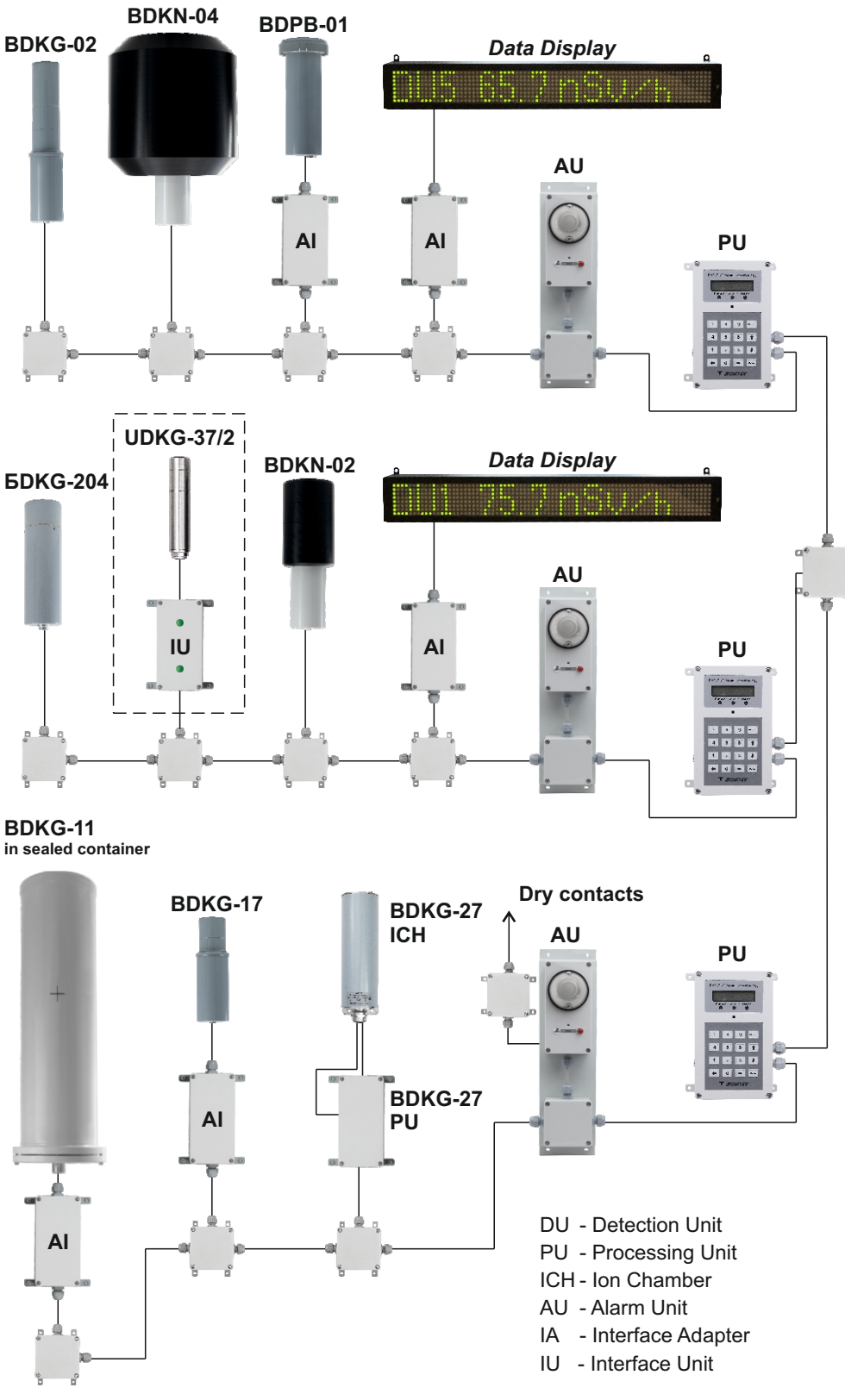
AT2327 Alarm Dosimeter

Purpose

AT2327 Alarm Dosimeter can be used for constructing a flexible and multichannel stationary system for radiation control of radiation-sensitive and radiation-dangerous sites, areas and facilities, as well as for radiation monitoring of environment, restricted area beamline radiation control at linear accelerators (LINACs) and other pulsed-radiation facilities.

Applications

- Nuclear industry facilities
- Radiological health care facilities
- Manufacturing facilities
- Radiation detection and dosimetric laboratories
- Civil defence facilities
- Linear accelerators (LINACs) and other pulsed-radiation facilities



Computer work station with "SARK.NET" application software





110-230 VAC 50-60 Hz

Control unit with backup power source

Features

- Gamma, beta and neutron radiation DUs
- Independent measurement for each channel of wide range gamma and neutron radiation dose rate as well as neutron and beta particles flux density
- Sound and light alarm in case threshold levels are exceeded for each DU
- High reliability
- Fault diagnostics
- Data logging of dose rate levels and cases of threshold exceeding
- Software for displaying current radiation situation in monitored area on PC screen
- Backup power supply unit
- Mobile one-channel version for vehicle mounting with any DU from the delivery set

AT2327 Alarm Dosimeter

OPERATING PRINCIPLE

Alarm dosimeter is based on detection units measuring:
- gamma radiation: BDKG-02, BDKG-11, BDKG-17, BDKG-27, BDKG-204, UDKG-37/2
- beta radiation: BDPB-01
- neutron radiation: BDKN-02, BDKN-04

Detection units (DU) are fully independent devices for measuring dose rate of gamma and neutron radiation and flux density of beta particles and neutrons. DUs send information to control panel and/or PC via RS485 interface. An adapter converting RS485 to USB or Ethernet is used for DU-to-PC communication. DU controls assigned sound and light alarm units to alert staff about radiation hazards.

PU displays the measured value at the point location of any selected DU in real time. When threshold level is exceeded or in case of failure of any system component sound and light alarm is actuated and emergency area is indicated on the PU screen. PU is used for setting thresholds for each DU, controlling DU state, correcting real-time clock, password protection of important functions, viewing dose rate fluctuation history and threshold levels exceeding in each reference point.

Each DU can be connected to a data display for measurement results, alert messages, current time and temperature display.

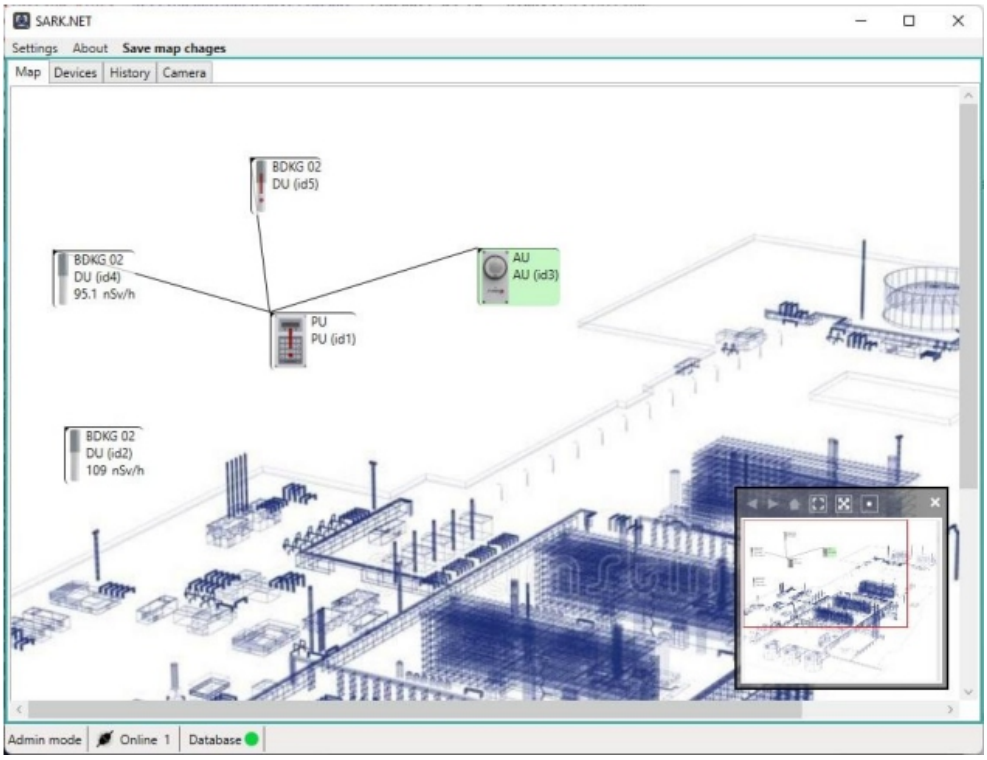
AT2331 Emergency alarm dosimeter and AT2327 Alarm dosimeter can be interconnected to create an Alarm systems for detection of self-sustaining chain reaction.

When the system is based on a PC the software allows generating and changing the configuration of the system reading as well as analyzing the data. PC screen is used for displaying the plan of the site under control. Reference points show measurement values

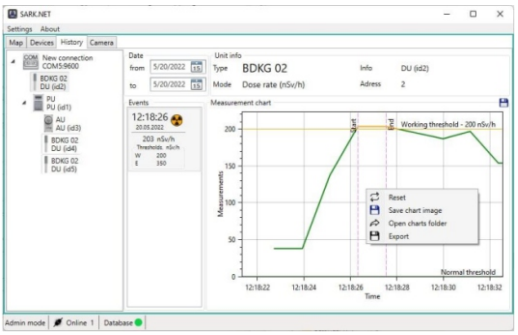
"SARK.NET" SOFTWARE

Purpose:

Visualisation of operation of a single or multiple AT2327 Alarm dosimeters joined into automated radiation control system on PC screen.







Functions:

- Display and edit the controlled network in the site plan
- Display and save monitoring data as diagrams
- Generate visual and sound notifications to system operator when threshold levels are exceeded or any component of the system fails
- Data on operation start and end time, software and hardware errors and history of exceeded threshold levels are recorded into "Radiation Monitoring" log
- Images from surveillance camera are captured when alarm situation occurs, with possibility to tie the camera to specific DUs
- Control of SQL server connection status.

Features:

Users can be divided into two groups "SARK.NET Administrators" and "SARK.NET Users".
A user in "SARK.NET Administrators" group has full rights to set up and edit the SARK network.
A user in "SARK.NET Users" group has no rights to change any settings. This user can browse event history and system network polling period only.

AT2327 Alarm Dosimeter

SPECIFICATION

Detector	*BDKG-02 / BDKG-17*	Geiger-Mueller counter tube
	BDKG-204	Scintillation plastic, Ø30x15 mm
	BDKG-11	NaI(Tl) scintillator, Ø63x63 mm
	BDKG-27	Ion chamber
	UDKG-37/2	Silicon semiconductor detector + Geiger-Mueller counter tube
	BDPB-01	Scintillation plastic, 30 cm^2
	BDKN-02 / BDKN-04	He-3 counter in polyethylene moderator
Measurement range of gamma radiation ambient dose equivalent rate	*BDKG-02*	0.1 µSv/h – 10 Sv/h
	BDKG-204	0.05 µSv/h – 10 Sv/h
	BDKG-11	0.03 – 100 µSv/h
	BDKG-17	1 mSv/h – 100 Sv/h
	BDKG-27	50 mSv/h – 4000 Sv/h
	UDKG-37/2	1 µSv/h – 5000 Sv/h
Limits of tolerable intrinsic relative error of gamma radiation ambient dose equivalent rate measurement	*BDKG-204 / BDKG-11 / BDKG-17 / BDKG-27*	±20%
	BDKG-02	±15%
	UDKG-37/2	±25%, for dose rate ≤10 µSv/h ±15%, for dose rate>10 µSv/h
Measurement range of gamma radiation average pulsed radiation dose rate	*UDKG-37/2*	30 µSv/s – 0.3 Sv/s (300 mSv/h – 1000 Sv/h) (pulse repetition rate is not less than 20 cps, duration not less than 1 µs)
Limits of tolerable intrinsic relative error of gamma radiation average pulse dose rate measurement	*UDKG-37/2*	±25%
Measurement range of neutron radiation ambient dose equivalent rate [from Pu-Be source]	*BDKN-02*	0.1 µSv/h – 10 mSv/h
	BDKN-04	0.1 µSv/h – 10 mSv/h
Limits of tolerable intrinsic relative error of neutron radiation ambient dose equivalent rate measurement	*BDKN-02*	±35%
	BDKN-04	±20%
Measurement range of neutron flux density [from Pu-Be source]	*BDKN-02*	0.1 – 10^4 neutron·s^{-1}·cm^{-2}
	BDKN-04	0.1 – 10^4 neutron·s^{-1}·cm^{-2}
Limits of tolerable intrinsic relative error of neutron flux density measurement	*BDKN-02*	±20%
	BDKN-04	±30%
Measurement range of beta particles flux density	*BDPB-01*	1 – $5·10^5$ particle·min^{-1}·cm^{-2}
Limits of tolerable intrinsic relative error of beta particle flux density measurement	*BDPB-01*	±20%
Energy range of gamma radiation	*BDKG-02 / BDKG-17*	60 keV – 3 MeV
	BDKG-11	50 keV – 3 MeV
	BDKG-27	60 keV – 1.5 MeV
	BDKG-204	20 keV – 10 MeV
	UDKG-37/2	50 keV – 10 MeV
Energy range of neutron radiation	*BDKN-02 / BDKN-04*	0.025 eV – 14 MeV
Energy range of beta radiation	*BDPB-01*	155 keV – 3.5 MeV
Typical sensitivity to ^{137}Cs gamma radiation*	*BDKG-02*	4.0 cps/(µSv·h^{-1})
	BDKG-204	70.0 cps/(µSv·h^{-1})
	BDKG-11	1970.0 cps/(µSv·h^{-1})
	BDKG-17	0.005 cps/(µSv·h^{-1})
	BDKG-27	2.1 µC/Sv
	UDKG-37/2	0.15 cps/(µSv·h^{-1}), for dose rate ≤0.2 Sv/h 58 mV/(Sv·h^{-1}), for dose rate >0.2 Sv/h
Typical sensitivity to Pu-Be neutron radiation	*BDKN-02 / BDKN-04*	*In dose rate measurement mode* 0.355 cps/(µSv·h^{-1})
		In flux density measurement mode 0.5 cps/(neutron·s^{-1}·cm^{-2})
Typical sensitivity to ^{90}Sr+^{90}Y beta radiation*	*BDPB-01*	0.3 cps/(particle·min^{-1}·cm^{-2})
Energy dependence relative to 662 keV (^{137}Cs)	*BDKG-02 / BDKG-17*	-20% to +35%
	BDKG-204	-45% to +35%(20 – 60 keV), ±25%(60 keV – 3 MeV), ±50%(3 – 10 MeV)
	BDKG-11	±20%
	BDKG-27 / UDKG-37/2	±30%

* Data for reference

AT2327 Alarm Dosimeter

SPECIFICATION

Power supply		Mains: 110-230 VAC, 50-60 Hz; Reserve battery in case of emergency power off (optional)
Alarm		3-stage light alarm and sound alarm
Number of detection units in one alarm dosimeter		1 – 10
Number of alarm dosimeters in the system for PC configuration		Up to 32
Distance between detection unit and processing unit/PC when interface cable is used		1000 m
Burn-up life		≥100 Sv $\geq 10^8$ Sv (BDKG-27) $\geq 5 \cdot 10^4$ Sv (UDKG-37/2)
Interface	*BDKG-02, BDKG-27, BDKG-204*	RS485
	BDKG-11, BDKG-17, BDPB-01	RS232
	BDKN-02, BDKN-04, UDKG-37/2	RS485
	Processing Unit	RS485
	Alarm Unit	RS485
	Data Display	RS485
Protection class	*BDKG-02*	IP57
	BDKG-204	IP67
	BDKG-17, BDPB-01	IP64
	BDKG-11 in sealed container	IP65
	BDKG-27 PU	IP55
	BDKG-27 ICH	IP21
	BDKN-02, BDKN-04	IP54
	UDKG-37/2 (Detection unit)	IP68
	UDKG-37/2 (Interface unit)	IP65
	Processing Unit	IP65
	Alarm Unit	IP65
	Data Display	IP21
Overall dimensions, weight	*BDKG-02*	Ø55x260 mm, 0.5 kg
	BDKG-204	Ø60x210 mm, 0.55 kg
	BDKG-11 in sealed container	Ø141x473 мм, 6.5 kg
	BDKG-17	Ø54x167 mm, 0.27 kg
	BDKG-27 PU	206x82x56 mm, 0.45 kg
	BDKG-27 ICH	190x58x65 mm, 0.7 kg
	UDKG-37/2 (Detection unit)	Ø30x130 mm, 0.25 kg
	UDKG-37/2 (Interface unit)	170x80x55 mm, 0.3 kg
	BDPB-01	Ø85x205 mm, 0.55 kg
	BDKN-02	Ø91x260 mm, 2.4 kg
	BDKN-04	235x264x315 mm, 8.0 kg
	Processing Unit	200x160x90 mm, 0.7 kg
	Alarm Unit	183x103x98 mm, 0.4 kg
	Data Display	644x98x67 mm, 4.0 kg
Working temperature range	*Detection Units*	-30°C ... +50°C
	BDKG-204, UDKG-37/2	-40°C ... +60°C
	BDKG-02, Alarm Unit	-40°C ... +50°C
	Data Display	-5°C ... +40°C
	Processing Unit	+5°C ... +40°C -40°C ... +50°C (option)
Relative air humidity with air temperature ≤35°C without condensation		≤95%

The alarm dosimeter complies with: GOST 27451-87, GOST 29074-91, Safety requirements of IEC 61010-1:2010, EMC requirements of EN 55011:2009, IEC 61000-4-2:2008, IEC 61000-4-3:2008, IEC 61000-4-4:2004, IEC 61000-4-5:2005, IEC 61000-4-6:2008, IEC 61000-4-8:2009, IEC 61000-4-11:2004

Design and specifications are subject to change without notice

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