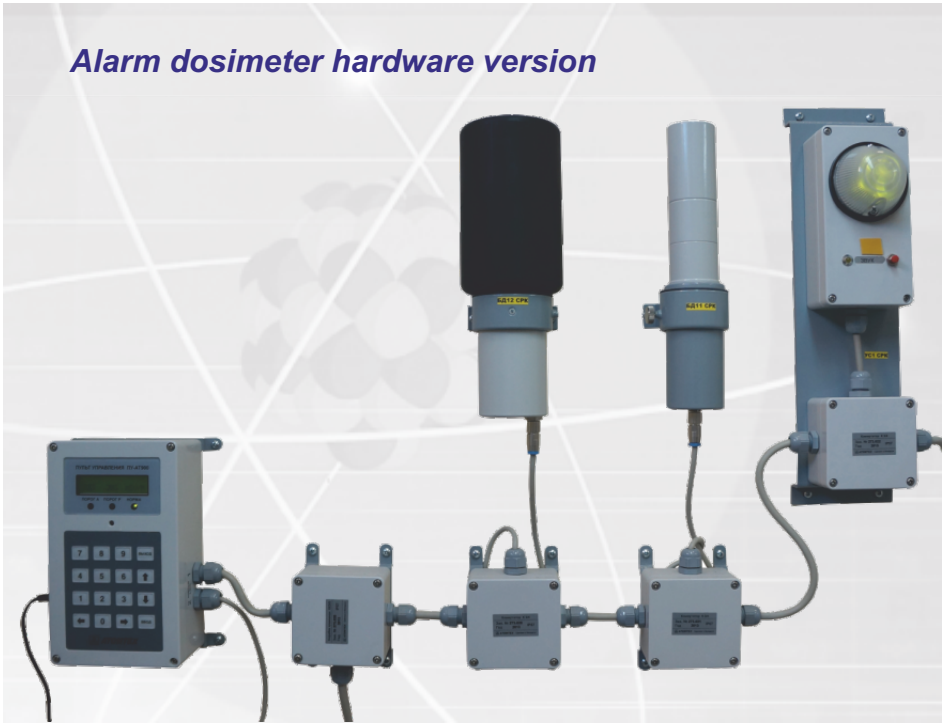
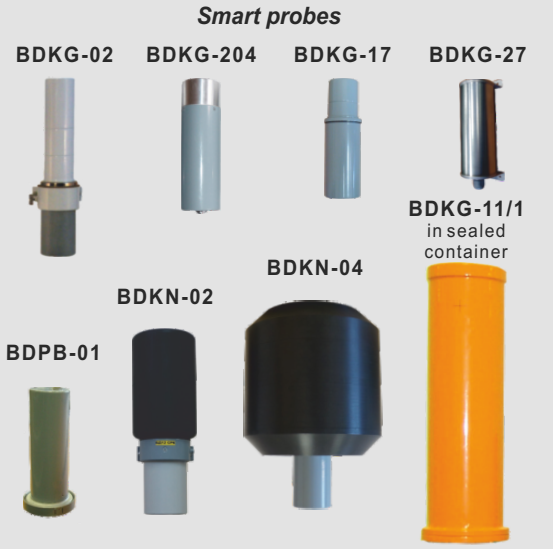
AT2327 Alarm Dosimeter

Alarm dosimeter hardware version



Smart probes



Data display

AT2327 Alarm Dosimeter can be used for building a flexible and multichannel stationary system for radiation monitoring of radiation-sensitive and radiation-dangerous sites, areas and facilities, as well as for radiation monitoring of ecological environment.

Operating principle

Alarm dosimeter is based on BDKG-02, BDKG-204, BDKG-11/1, BDKG-17, BDKG-27 gamma radiation smart probes, BDPB-01 beta radiation smart probe, and BDKN-02, BDKN-04 neutron radiation smart probes.

Alarm dosimeter can be optionally shipped with AT2331 Emergency alarm monitor.

Smart probes are fully independent units for measuring gamma and neutron radiation dose rate and beta particles and neutron flux density with 2-second interval, which control sound and light alarm function to alert staff about radiation hazards. Smart probes send information to control panel and/or PC via RS485 interface. Smart Probe-to-PC communication is done via adapter, which converts RS485 to USB or RS232 signal.

Measured value of selected smart probe and current time is displayed on control panel screen. 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 control panel screen. Control panel is used for setting thresholds for each smart probe, controlling smart probes state, correcting real-time clock, password protection of selected functions, viewing dose rate fluctuation history and threshold levels crossing in each reference point.

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

When the system is based on a PC the software can be used for setting up and adjusting system configuration, read data and its analysis. PC screen is used for displaying monitored site plan. Reference points show measurement values presented as charts and tables.

Applications

- Nuclear industry facilities
- Radiological health care facilities
- Manufacturing facilities
- Radiation detection and dosimetric laboratories
- Civil defence facilities

Features

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

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Specification

The number of smart probes in one alarm dosimeter	1...10
The number of alarm dosimeters in the system for PC configuration	32 max.
Measurement range	
Ambient gamma radiation dose equivalent rate	
BDKG-02	0.1 μSv/h ... 10 Sv/h
BDKG-204	0.05 μSv/h ... 10 Sv/h
BDKG-11/1	0.01 μSv/h ... 100 μSv/h
BDKG-17	1 μSv/h ... 100 Sv/h
BDKG-27	50 mSv/h ... 5000 Sv/h
Ambient neutron radiation dose equivalent rate	
BDKN-02 (from Pu-Be sources)	0.1 μSv/h ... 10 mSv/h
BDKN-04 (0.025 eV...14 MeV)	0.1 μSv/h ... 10 mSv/h
Beta particles flux density measurement range (BDPB-01)	1 ... $5 \cdot 10^5$ particle/(min·cm^2)
Neutron flux density measurement range (BDKN-02, BDKN-04)	0.1 ... $1 \cdot 10^4$ neutron/(s·cm^2)
Sensitivity	
^{137}Cs gamma radiation	
BDKG-02	4.0 cps/μSv·h^{-1}
BDKG-204	70.0 cps/μSv·h^{-1}
BDKG-11/1	1970.0 cps/μSv·h^{-1}
BDKG-17	0.005 cps/μSv·h^{-1}
BDKG-27	2.1 μC/Sv
^{90}Sr + ^{90}Y beta radiation	
BDPB-01	0.3 cps/(particles·min^{-1}·cm^{-2})
Pu-Be source neutron radiation	
BDKN-02	1.15 cps/(neutrons·sec^{-1}·cm^{-2})
BDKN-04	1.5 cps/(neutrons·sec^{-1}·cm^{-2})
Response time for dose rate measurement (for dose rate ≥1 μSv/h)	
BDKG-02, BDKG-204	≤3 s
BDKG-11/1	<2 s
Energy range	
Gamma radiation	
BDKG-02, BDKG-17,	60 keV ... 3 MeV
BDKG-11/1	50 keV ... 3 MeV
BDKG-27	60 keV ... 1.5 MeV
BDKG-204	60 keV ... 3 MeV
Registered beta particles	
BDPB-01	155 keV ... 3.5 MeV
Registered neutrons	
BDKN-02, BDKN-04	0.025 eV ... 14 MeV
Energy dependence relative to 662 keV (^{137}Cs)	
BDKG-02	-20% ... +35%
BDKG-11/1	-20% ... +20%
BDKG-17	-25% ... +35%
BDKG-27	-30% ... +30%
BDKG-204	-25% ... +25%
Intrinsic relative error of dose rate and flux density measurement	±20% max. ±15% max. (BDKG-02)
Alarm	3-stage light alarm and sound alarm
Burn-up life	≥100 Sv (BDKG-27:≥10^8 Sv)

Design and specifications are subject to change without notice

Power supply	Mains: 230VAC (+23/-35 VAC), 50±2 Hz; Reserve battery in case of emergency power off: 12.6V (+1.3;-1.6), or 25.2V (+2.6;-3.2)
Maximum distance between smart probe and the control panel/PC when interface cable is used	1000 m
Interface	
BDKG-02	RS485
BDKG-11/1, BDKG-17	RS232
BDKG-27, BDKG-204	RS485
BDPB-01	RS232
BDKN-02, BDKN-02	RS485
Control panel	RS485
Alarm unit	RS485
Data display	RS485
Protection class	
BDKG-02, BDKG-204	IP57
BDKG-11/1 (in sealed container)	IP65
BDKG-17, BDPB-01	IP64
BDKG-27	
electronic unit	IP55
ionization chamber	IP21
BDKN-02, BDKN-04	IP54
Control panel	IP55
Alarm unit	IP65
Data display	IP21
Working temperature range	
Data display, Control panel	+5°C...+50°C
Detection units	-30°C...+50°C
BDKG-02, BDKG-04, Alarm unit	-40°C...+50°C
Relative air humidity	
Detection units, other devices *(with air temperature ≤ 35°C without condensation)*	≤ 95%
BDKG-27 *(with air temperature ≤ 30°C without condensation)*	≤ 75%
Overall dimensions, weight	
BDKG-02	Ø55x260 mm, 0.5 kg
BDKG-204	Ø61x210 mm, 0.55 kg
BDKG-11/1 (in sealed container)	Ø141x473 mm, 6.5 kg
BDKG-17	Ø54x167 mm, 0.27 kg
BDKG-27	
electronic unit	206x82x56 mm, 0.45 kg
ionization chamber	190x58x56 mm, 0.7 kg
BDPB-01	Ø80x196 mm, 0.55 kg
BDKN-02	Ø91x260 mm, 2.4 kg
BDKN-04	235x264x315 mm, 8.0 kg
Control panel	200x160x90 mm, 0.7 kg
Alarm unit	185x85x95 mm, 0.4 kg
Data display	643x97x67 mm, 4.0 kg

AT2327 Alarm Dosimeter meets International standard requirements: IEC 61017-1:1991, EN 50371:2002

Safety standard requirements:IEC 61010-1:1990

EMC requirements:
EN 55022:1998+A1:2000+A2:2003,
EN 55024:1998+A1:2001+A2:2003,
IEC 61000-4-2:2006, IEC 61000-4-3:2008,
IEC 61000-4-4:2004, IEC 61000-4-5:2005,
IEC 61000-4-11:2004

AT2327 Alarm Dosimeter has the pattern approval certificates of Republic of Belarus, Russian Federation, Ukraine and Kazakhstan.

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