SPC DOZA

AREA MONITOR

FREGAT

RADIATION
MONITORING
EQUIPMENT

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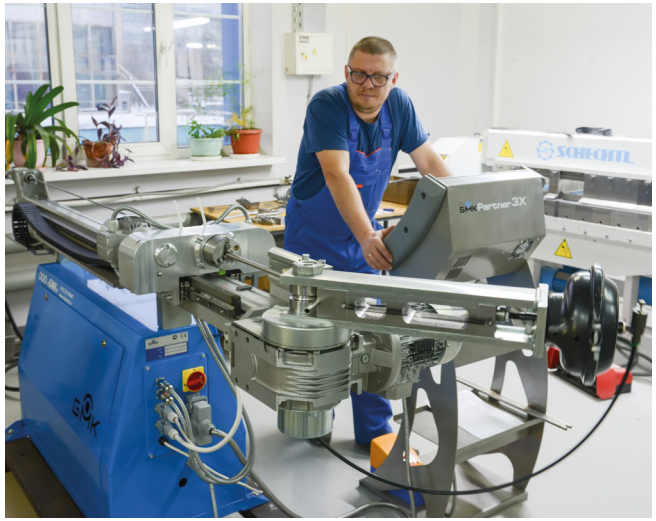
ABOUT THE COMPANY

SPC «Doza» is a well-known brand in the market of radiation monitoring equipment since 1991. Our clients all over the world have been relying on our top up-to-date solutions and radiation monitoring systems (RMS, ARMS, ERMS), criticality accident alarm systems (CAAS) for almost 30 years by now. Our team keeps developing top products and radiation monitoring instruments: dosimeters, radiometers, spectrometers.

Equipment developed by SPC «Doza» is in great demand in all the fields related to ionizing radiation, such as nuclear power, nuclear industry, medicine, environmental monitoring, safety control and scientific research.

Our own R&D centre and manufacturing line allows us to bring new products to the market using top innovative technologies, expertise and latest scientific developments.

SPC «Doza» meets highest international standards, which is confirmed by: quality management ISO 9001, GOST R ISO 9001 and GOST RV 0015-002, environmental management ISO 14001, occupational health and safety management ISO 45001, information security ISO 27001, ensuring the uniformity of measurements ISO 17025.



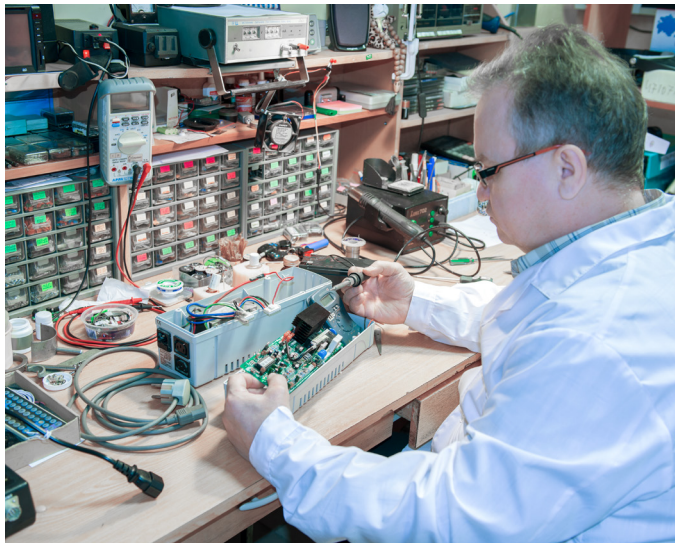
Since June 2018 SPC «Doza» has implemented Rosatom production system (RPS). Our products are certified and registered by the National Register of Measuring Instruments (MI) and complies with the requirements of IEC and ISO standards. The company performs customized modifications and certifications of the instruments and systems too.

We provide our clients with additional services, such as: design, installation, entering into service and commissioning works. We guarantee product support and service for the entire lifetime of the equipment.

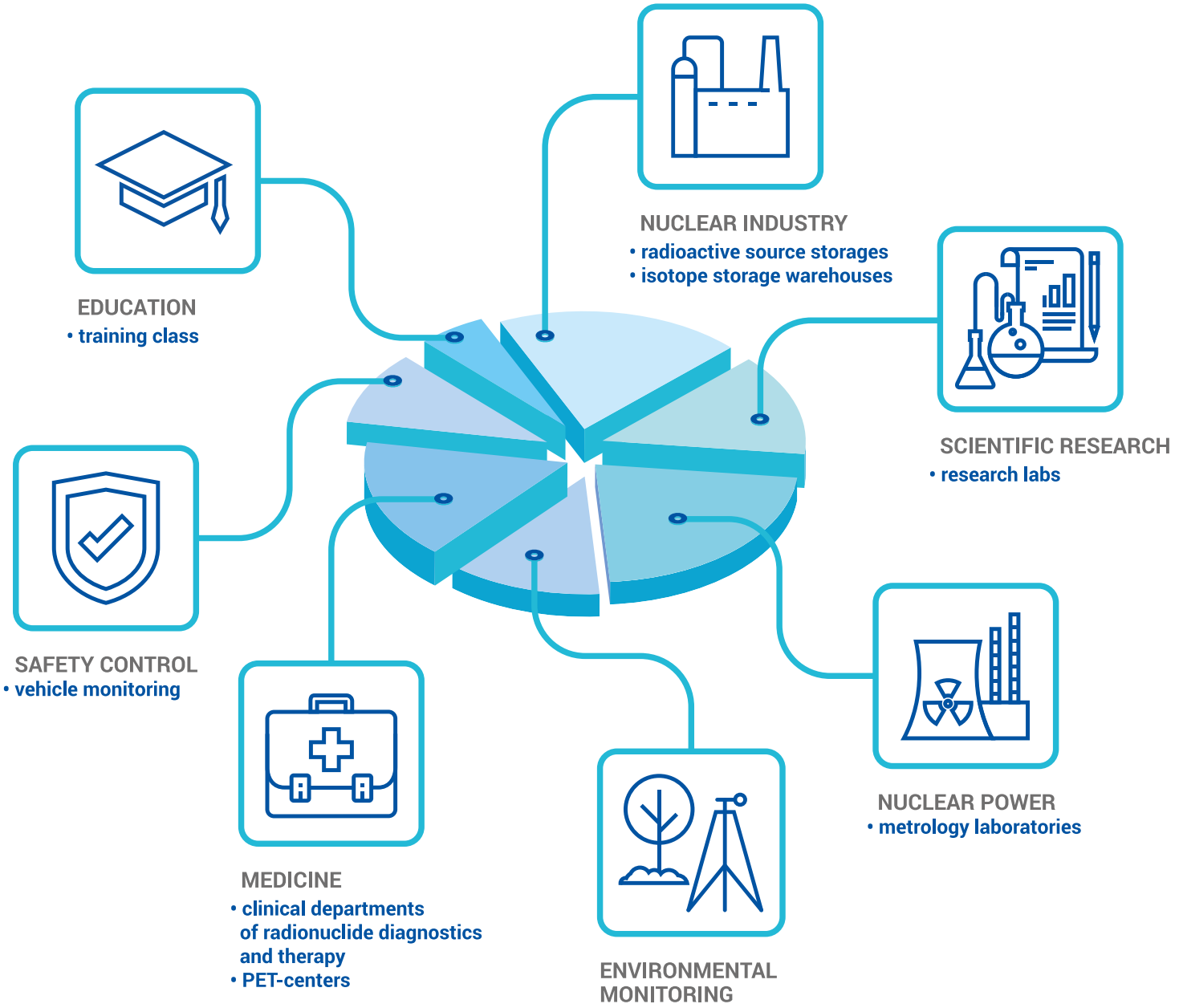
SPC «Doza» testing and metrological facilities provide measurement calibration and adjustment of the equipment; they are registered in Rosstandart Federal Information Fund, which ensures the uniformity of measurements.

SPC «Doza» is involved in educational and scientific activities. The company has been publishing the scientific journal «ANRI» since 1994.

SPC «Doza» has its own Training and Methodological Center «Safety and control» (TMC). For more than 10 years the TMC's training events due to their interesting and state-of-the-art programs are the most visited and widely reputed ones in Russia, the CIS among foreign partners and SPC «Doza» dealers.



MARKET SEGMENTS



FREGAT

Area Monitor

Area Monitor «Fregat» is designed to configure relatively simple and inexpensive radiation monitoring systems for radiation hazardous facilities, such as radioactive source storages, isotope storage warehouses, clinical departments of radionuclide diagnostics and therapy, PET-centers, metrology laboratories that perform work with the use of ionizing radiation sources etc.

In accordance with the requirements of the Basic Sanitary Rules of Radiation Safety OSPORB-99/2010

automated means of radiation monitoring with visual and audible alarms must be used at the facilities of I and II category as well as during the works of 1st class. Small scale automated radiation monitoring systems that are compiled on the basis of the Area Monitor «Fregat» are an ideal solution for these tasks.

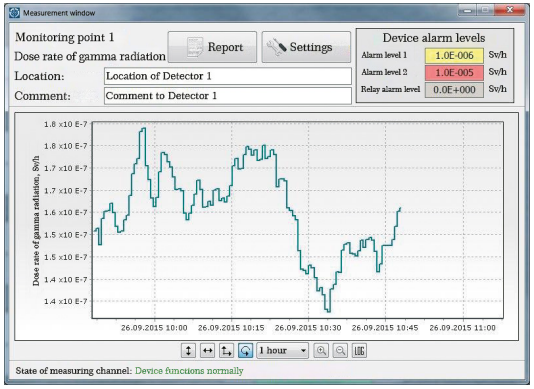
Area Monitor «Fregat» requires no virtual adjustment, installation of that RMS is user-friendly and operation is easy and comfortable.

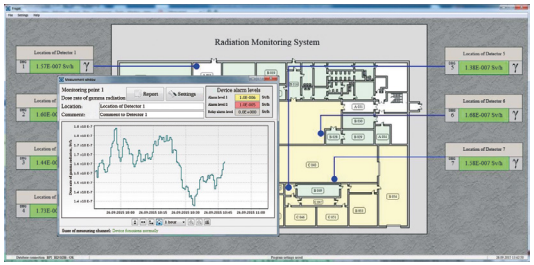
SOFTWARE

Automated acquisition, processing, and storage of the environmental radiation monitoring parameters from the Area Monitor «Fregat»

SOFTWARE PROVIDES

- acquisition, processing, storage and displaying of the current data of monitored parameters at the operator's workplace;
- light and sound alarms about the status of the monitored parameters relative to the warning ones and alarm thresholds at the operator's workplace;
- automated monitoring of measuring channels operability, displaying information about the type of a fault;
- processing, storage and displaying the data via graphics of changes in values over time (trends);
- processing, storage and displaying the events referred to the measuring channels that take place in the system (malfunctions, communication loss, excess of the thresholds by the measured values);
- reporting on the measurement values for selected time intervals with the calculation of the hourly or daily minimum, maximum, and average values.





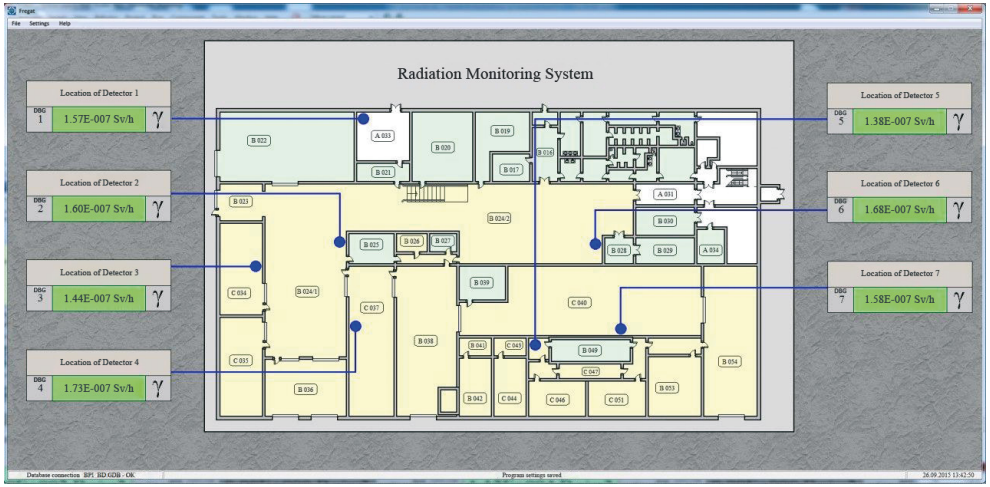
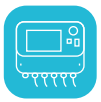


DIAGRAM OF FREGAT

Upper level

RMS workstation

Low level

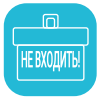


BPI-1D
Local display unit

BZS-02D "Micro"
External audible alarm

UDMG-100
Detecting device

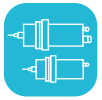
UDKG-100
Detecting device



Illuminated warning sign

External display unit

UDVG-100
Detecting device



BDMG-101
High range

UDMN-100
Neutron area monitor

UDKS-100
Gamma and X-ray area monitor

BAS / BAS-1s
External alarms

BDV-02D "Micro"
Relay output unit

BAS-2 "Micro"
External visual alarm

DBG-S11D
Wide range gamma area monitor

IP-1
Power injector

KK-5
Terminal box

RMS
workstation

- The PC-based RMS workplace of the operator is used as a central console. It performs data exchange management and its storage.
- The platform features allow to implement a local saving and archiving of the measured data, display the current measured values on the slides of mnemonic diagrams, display changes in values in the form of trend graphs, generate warning and alarm signals, maintain event logs and generate reports. Moreover, it has an option of differentiation of users' rights according to access level, remote control of the system by a web browser, etc.

COMMUNICATION SYSTEM

- The communication system is based on RS-485 network. Branch networking is performed via standard switches.

Length of lines

- from concentrator to peripheral unit – up to 1200 m (cable);
- from concentrator to concentrator –
- up to 2 km (cable), fibre optic lines or WiFi;
- from RMS workplace to concentrator – up to 100 m (cable).

BPI-1D

local display unit

Displaying of the monitored parameters from external measuring instruments.

PURPOSE

- Acquire, process and display the monitored parameters on the built-in information panel.
- Compare values of the monitored parameters with the preset thresholds;
- Transfer values of the monitored parameters to data channels;
- Alarm activation in case of an excess of the preset thresholds, including external alarm units.

FEATURES

- Display diagonal 14.2 cm (5.6 ");
- The unit operates automatically and does not require personnel attention;
- Diagnostic test of the unit status and status of the connected devices:
- - visually on panel;
- - using adjustment software when connected to PC via USB.
- Automatic operability check of devices with transfer of data on operability (state status) to the external data network.
- The information panel displays as follows:

  - diagnostic information on the status of connected devices;
  - current date and time;
  - values of the measured parameters;
  - position of the measured parameters with respect to the thresholds in the form of scales with green, yellow and red areas;
  - graph of changing with time (trend) for every measured value.

ELECTRICAL CHARACTERISTIC

- Communication interface: RS-485;
- Number of connected devices:

  - measuring devices: not more than15;
  - external devices with audible and visual alarm: not more than 15;
- Warm-up time: not more than 1 min;
- Continuous operation time: not less 24 h;
- Power supply: 220 V, 50 Hz; 12 ÷ 24 V.

PHYSICAL CHARACTERISTIC

Operating temperature range

- 0 ÷ + 50 °C.

MECHANICAL CHARACTERISTIC

- IP rating: IP54;

Overall dimensions, weight

- not more than 296×248×118 mm, not more than 5 kg.

BZS-02D «MICRO»

external audible alarm

Generation of audible alarm in case the preset thresholds are exceeded.

PHYSICAL CHARACTERISTIC

- Communication cable length: up to 1200 m;

Operating temperature range

- 0 ÷ +50 °C;
- Audible alarm: 80 ÷ 100 dB at distance of 1 m.

ELECTRICAL CHARACTERISTIC

- Power supply: +12 V.

MECHANICAL CHARACTERISTIC

- IP rating: IP23;

Overall dimensions, weight

- 140×84×57 mm, 0.55 kg.

UDMG-100

detecting device

Measurement of ambient dose equivalent rate for gamma radiation

- Detecting device elements:

  - detector unit BDMG-100-07;
  - interface unit BS-11.

PHYSICAL CHARACTERISTIC

- Detector: gas-discharge counters;

Measurement range

- 0.1 μSv/h ÷ 10 Sv/h;

Energy range

- 0.05 ÷ 3.0 MeV;

Operating temperature range

- minus 40 ÷ +50 °C.

ELECTRICAL CHARACTERISTIC

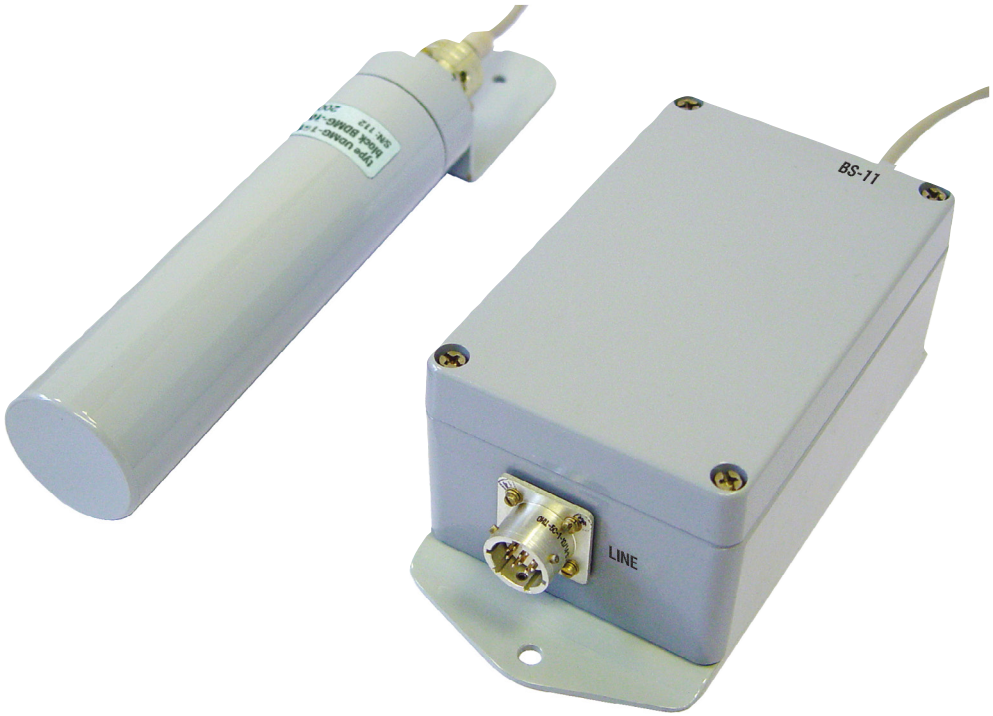
- Power supply: 24 V;
- Communication interface: RS-485 (DiBus);
- Communication with the upper-level ARMS implemented via BOP-1M.
- Communication to upper-level ARMS is implemented with BOP-1M

MECHANICAL CHARACTERISTIC

- IP rating: IP65;

Overall dimensions, weight

- BDMG-100-07: Ø 40×225 mm, 0.5 kg.



UDKG-100

detecting device

Detecting device for measurement of gamma flux density in rocks and ore, liquid media and pulp that contains radionuclides

PURPOSE

- Measurement of gamma-quantum flux or exposure dose rate in wells, pulp and other liquid media, including measurements during well logging

CONFIGURATION

- Detecting device consists of a detector unit BDKG-100-07 and interface unit BS-16DD (or BS-16PD) connected with each other by well-logging coaxial cable.

BY REQUEST

- interface converter of PI-02 type;
- software «TETRAChecker»;
- flow chamber BDKG-100.

PHYSICAL CHARACTERISTIC

- Detector: scintillation;
- Measurement range of gamma-quantum flux density (Cs-137) 10 ÷ 100000 s-1;
- Measurement range of exposure dose rate (Cs-137) 5h ÷ 10000 μR/h;
- Sensitivity to gamma radiation (Cs-137) 1 s-1 per 1 μR/h;

Operating temperature range

- minus 40 ÷ +50 °C;
- Cable length between BDKG-100-07 and BS-16 up to 1000 m;
- Depth of immersion up to 100 m.

MECHANICAL CHARACTERISTIC

- UDKG-100 consists of:

  - detector unit BDKG-100-07;
  - interface unit BS-16;
  - output signal RS-485;

Overall dimensions, weight

- BDKG-100-07 — Ø 35×750 mm, 2.6 kg; BS-16 — 176×80×64 mm, 0.8 kg;

Overall dimensions, weight

- BDKG-100 — Ø 35×750 mm, 2.6 kg.

ILLUMINATED WARNING SIGN

Indication of warning signs:
«Do not enter», «Monitor on»,
«Blocking» etc. when the preset thresholds are exceeded

PHYSICAL CHARACTERISTIC

- Operating temperature range
- minus 10 ÷ +50 °C.

MECHANICAL CHARACTERISTIC

- IP rating: IP23;

Overall dimensions, weight

- 330×110×20 mm, 0.5 kg.

EXTERNAL DISPLAY UNIT

Displaying of data received from the Area Monitor equipment

PHYSICAL CHARACTERISTIC

- Character height:
  - Impuls-710-R: 100 mm;
  - Impuls-715-D4S: 150 mm;
  - Impuls-727-D4S: 270 mm;
- Communication cable length: up to 1200 m;

Operating temperature range

- Impuls-710-R: 0 ÷ +50 °C;
- Impuls-715-D4S: minus 40 ÷ +50 °C;
- Impuls-727-D4S: minus 40 ÷ +50 °C.

ELECTRICAL CHARACTERISTIC

- Power supply: 220 V 50 Hz; Communication interface: RS-485.

MECHANICAL CHARACTERISTIC

- IP rating:
  - Impuls-710-R: IP44;
  - Impuls-715-D4S; -727-D4S: IP65;

Overall dimensions, weight

- Impuls-710-R: 400×160×60 mm, 3 kg;
- Impuls-715-D4S: 815×250×80 mm, 5 kg;
- Impuls-727-D4S: 1250×330×80 mm, 5 kg.

REGULATIONS

- EMC: IEC 61010, IEC 61000-6-2;
- Seismic: IEC 60980.

UDVG-100

detecting device

Detecting devices to detect gamma emitting radionuclides

The detecting device consists of one or two detector units BDVG-100-08 (depending on the tasks assigned) connected to an interface unit BS-17 with signal cables.

PURPOSE

- Measurement of ambient dose equivalent rate for gamma radiation.

Minimum detectable activity of source Cs-137:

- for railway transport control 3350 kBq;
- for motor transport control 1000 kBq;
- for pedestrian control, one way 750 kBq;
- for pedestrian control, two ways 70 kBq.

ELECTRICAL CHARACTERISTIC

- Remote control communication interface RS-422;
- PC communication interface during adjustment RS-422 (via converter RS-232 – RS-422/485 with software «Tetra-Checker»);
- Output signal RS-485;
- Communication line length up to 500 m.

PHYSICAL CHARACTERISTIC

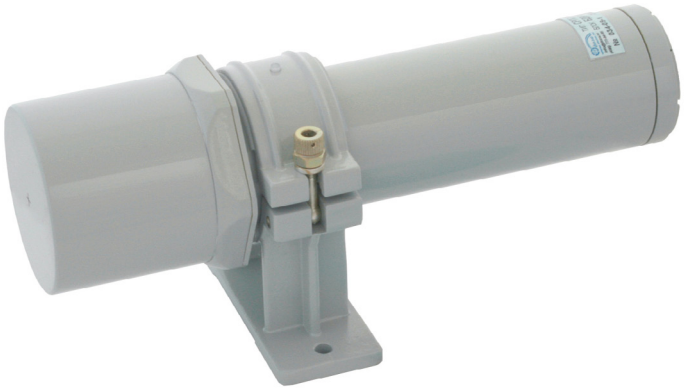
Operating temperature range

- minus 40 ÷ +50 °C.

MECHANICAL CHARACTERISTIC

Overall dimensions, weight

- BDVG-100-08 Ø 88×300 mm, 3.0 kg;
- BS-17 176×80×64 mm, 0.8 kg.



BDMG-101

high range gamma area monitor

Measurement of ambient dose equivalent rate or absorbed dose rate of photon radiation:

- high temperature operation (up to 120 °C).

PHYSICAL CHARACTERISTIC

Detector — ionization chamber:

- MIC-01/2 — stainless steel;
- MIC-03 — duraluminium;
- MIC-04 — titanium;

Measurement range

of ambient dose equivalent rate:

- MIC-01: 0.05 mSv/h ÷ 200 Sv/h;
- MIC-02: 0.5 mSv/h ÷ 1,000 Sv/h;

of absorbed dose rate:

- MIC-03: 0.01 mGy/h ÷ 100 Gy/h;
- MIC-04: 5 mGy/h ÷ 10,000 Gy/h;

Energy range

- 0.05 ÷ 3.0 MeV;

Operating temperature range

- MIC-01: minus 30 ÷ +120 °C;
- MIC-02/03/04, Electrometer module: minus 30 ÷ +60 °C.

ELECTRICAL CHARACTERISTIC

- Communication interface: RS-485;
- MIC-to-electrometer-module cable length: up to 30 m;
- Communication with the upper-level ARMS implemented via BOP-1M.

MECHANICAL CHARACTERISTIC

- IP rating: IP65;

Overall dimensions, weight

- Electrometer module: Ø 110×300 mm, 2 kg;
- MIC-01: Ø 85×210 mm, 1 kg;
- MIC-02: Ø 45×160 mm, 0.3 kg;
- MIC-03: Ø 140×230 mm, 1 kg;
- MIC-04: Ø 35×90 mm, 0.2 kg;

Regulations

- RF MI reg. No: 64529-16;
- Certificate of the Nuclear Facility Certification System (OIAE) No: OIAE.RU.013.(OS).00493;
- Safety class 3N;
- Physical: IEC 60951;
- EMC: IEC 61010, IEC 61000-6-2;
- Seismic: IEC 60980;

Versions

- BDMG-101 — module of ionization chamber (MIC) and module of electrometer (ME);
- BDMG-101M — module of ionization chamber (MIC-01) and module of electrometer (ME).

UDMN-100

neutron area monitor

Measurement of ambient dose equivalent rate of neutron radiation

PHYSICAL CHARACTERISTIC

- Detector: scintillator ZnS(Ag), Li-6;

Measurement range

- 0.1 μSv/h ÷ 0.1 Sv/h;

Energy range

- 0.025 eV ÷ 14.0 MeV;

Operating temperature range

- minus 45 ÷ +50 °C.

ELECTRICAL CHARACTERISTIC

- Communication interface: RS-485.

MECHANICAL CHARACTERISTIC

- IP rating: IP65;

Overall dimensions, weight

- 428×258×347 mm, 11.5 kg.

REGULATIONS

- RF MI reg. No: 31091-06;
- OIAE certificate No:
- ROSS RU.0001.01AE00.77.10.0975;
- Physical: IEC 61005, IEC 61322;
- EMC: IEC 61010, IEC 61000-6-2;
- Seismic: IEC 60980.

UDKS-100

gamma and X-ray area

Measurement of ambient dose equivalent rate
of continuous and pulse X-ray and gamma radiation.

PHYSICAL CHARACTERISTIC

- Detector: tissue equivalent plastic scintillator,
  Ø 45×20 mm;

Measurement range

- 0.1 μSv/h ÷ 1 Sv/h ; Energy range
- 0.015 ÷ 10 MeV;

Operating temperature range

- minus 40 ÷ +50 °C.

ELECTRICAL CHARACTERISTIC

- Communication interface: RS-485.

MECHANICAL CHARACTERISTIC

- IP rating: IP65;

Overall dimensions, weight

- Ø 72×265 mm, 1.5 kg.

REGULATIONS

- RF MI reg. No: 46660-11;
- Physical: IEC 60846, IEC 60532;
- EMC: IEC 61010, IEC 61000-6-2;
- Seismic: IEC 60980.

BAS / BAS-1S

external alarms

Audible and visual alarms in case ARMS equipment thresholds are exceeded.

- Audible alarm: 85 ÷ 100 dB at distance 1 m;
- Visual alarm: red, yellow and green.

PHYSICAL CHARACTERISTIC

Communication cable length

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

Operating temperature range

- minus 10 ÷ +50 °C.

ELECTRICAL CHARACTERISTIC

- Power supply: 220 V, 50 Hz.

MECHANICAL CHARACTERISTIC

- IP rating:
- BAS: IP54;
- BAS-1S: IP65;

Overall dimensions, weight

- BAS: 145×108×466 mm, 1.7 kg;
- BAS-1S: 160×108×472 mm, 1.85 kg;

Normative documents

- OIAE certificate No
- ROSS RU.0001.01AE00.77.10.0965;
- Safety class 3N;
- EMC: IEC 61010, IEC 61000-6-2;
- Seismic: IEC 60980.

BDV-02D «MICRO»

relay output unit

Management of actuators control (door lock, ventilation isolation, special-purpose signaling devices).

ELECTRICAL CHARACTERISTIC

- Communication cable length up to 1200 m;
- Relay number — 3 pc;
- Power supply +12 V.

PHYSICAL CHARACTERISTIC

Operating temperature range

- 0 ÷ +50 °C.

MECHANICAL CHARACTERISTIC

- IP rating: IP23;

Overall dimensions, weight

- 140×84×57 mm, 0.55 kg.

BAS-2 «MICRO»

external visual alarm

Generation of visual alarm in case the preset thresholds are exceeded

PHYSICAL CHARACTERISTIC

- Communication cable length:
  - up to 1200 m;

  Operating temperature range
- 0 ÷ +50 °C;

  Visual alarm: green, yellow and red.

ELECTRICAL CHARACTERISTIC

- Power supply: +12 V;
- Communication interface:
  - RS-485;
  - relay output.

MECHANICAL CHARACTERISTIC

- IP rating: IP23;

  Overall dimensions, weight
- 160×84×41 mm, 0.2 kg.

DBG-S11D

wide range gamma area monitor

Measurement of ambient dose equivalent rate of gamma radiation.

PHYSICAL CHARACTERISTIC

- Detector: gas-discharge counters;

Measurement range

- DBG-S11D: 0.1 μSv/h ÷ 10 mSv/h;
- DBG-S11D-01: 0.1 μSv/h ÷ 10 Sv/h;
- DBG-S11D-02: 0.1 μSv/h ÷ 100 Sv/h;

Energy range

- 0.05 ÷ 3.0 MeV;

Operating temperature range

- minus 40 ÷ +50 °C.

ELECTRICAL CHARACTERISTIC

- Communication interface: RS-485, USB.

MECHANICAL CHARACTERISTIC

- IP rating: IP68;

Overall dimensions, weight

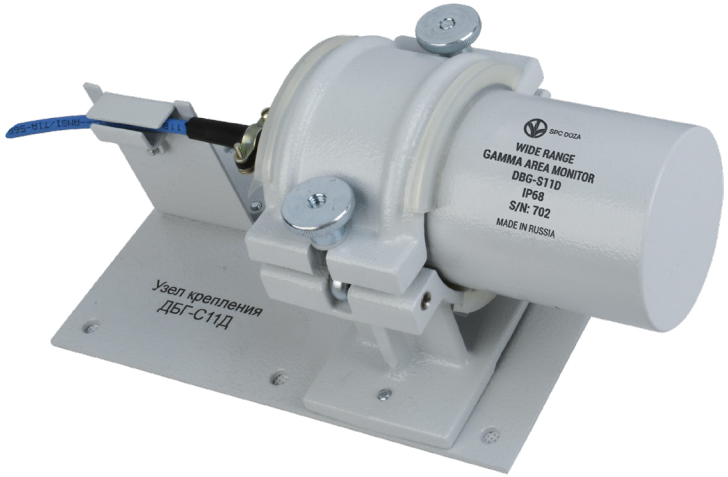
- DBG-S11D: Ø 68×141 mm, 0.65 kg;
- DBG-S11D-01: Ø 68×179 mm, 0.7 kg;
- DBG-S11D-02: Ø 68×179 mm, 0.7 kg.

REGULATIONS

- RF MI reg. No: 42783-11;
- OIAE certificate No:
- ROSS RU.0001.01AE00.77.10.0995;
- Physical: IEC 60846, IEC 60532;
- EMC: IEC 61010, IEC 61000-6-2;
- Seismic: IEC 60980.

VERSIONS

- DBG-S11D;
- DBG-S11D-01;
- DBG-S11D-02.



IP-1

power injector

Additional device for forming and powering the communication channel of the BOP-1M data processing and transmission unit with control, measuring and signalling equipment based on the RS-485 interface.

ELECTRICAL CHARACTERISTIC

- RS-485 interface repeater could be installed to increase the length of the communication channel or its load capacity;
- Input power supply voltage of the injector:
- 176 ÷ 264 V;
- Power consumption: 160 VA;
- Output voltage: (18 ± 0.5) V;
- Maximum output current: 1 A.

PHYSICAL CHARACTERISTIC

Operating temperature range

- minus 40 ÷ +50 °C;
- Operating relative air humidity: up to 98 % at +35 °C.

MECHANICAL CHARACTERISTIC

- IP rating: IP65;

Overall dimensions, weight

- 200×252×132 mm, 2.1 kg.

KK-5

terminal box

- Protection of cable junctions and electrical circuit branches in electrical wiring
- Protection of wire from aggressive environments and mechanical damages.

PROPERTIES

- Cable inlets provide reliable protection of the unit from moisture and dust.

ELECTRICAL CHARACTERISTIC

- Version of switching groups: based on screwless quick-connect terminal blocks WAGO;
- Cross-sectional area of connected cables: 0.08 ÷ 2.5 mm^2;
- Number of wires to switch (maximum cable diameter): 7 switching groups have 4 contacts each (13.5 mm).

MECHANICAL CHARACTERISTIC

- IP rating: IP54;

Overall dimensions, weight

- 180×119×50 mm, not more 0.4 kg;

Enclosure material

- Plastic.

SPC DOZA

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