



SPC DOZA

GAS-AEROSOL EMISSION MONITORING PROCESS STREAMS MONITORING

RADIATION
MONITORING
EQUIPMENT

GAS-AEROSOL EMISSION MONITORING



SKGAV / STACK MONITOR

The SKGAV system is designed to monitor gas-aerosol volumetric activity in occupational air, ventilation systems and air emissions of nuclear power plants, other nuclear energy facilities, general industry facilities, scientific and research laboratories where sources of ionizing radiation are used.

The SKGAV stack monitor can be integrated into the radiation monitoring system PELIKAN (RMS PELIKAN) or in a third party RMS. It also can serve as a stand-alone system for continuous automated gas-aerosol radiation monitoring in 24/7 mode.

Standard SKGAV system scope of supply:

- UDA-1AB particulate monitor
- UDI-1B iodine monitor
- UDG-1B noble gas monitor
- UPPVM airflow parameters monitor
- BN-01 pumping unit
- Mounting rack (rigid frame) with auxiliary equipment

Bespoke design is also possible.

The SKGAV system can be supplied on a single rigid frame or the monitors can be mounted on walls according to the customer's project design documentation. If necessary each monitor can be supplied separately and serves as a stand-alone measuring instrument.



UDA-1AB

PARTICULATE MONITOR



Automated continuous monitoring of gas-aerosol volumetric activity caused by alpha- and beta- emitting nuclides in occupational air and ventilation ducts and pipes.

FEATURES

- Two silicon detectors (one for measuring, one for compensation).
- Compensation of the radon and thoron progenies, gamma background compensation.
- Alpha spectrometry.
- Sound alarm: 85 ÷ 100 dB on 1 m distance. Sound muting button.
- Visual alarm: green – yellow – red lights.
- Provision to connect BAS-type external alarm unit.
- Control of external units such as electromagnetic valves, pumps, etc.
- Communication with upper level systems via Ethernet and RS-485.
- 4-20 mA analog output (optional).
- Parameters configuration, alarm thresholds setting and archive reading via connected PC using the “Configurator” software (RS-232 interface).
- Periodic functional tests using check source.
- Unattended mode of operation, except the filter replacement.
- Filter type: LFAC, FSLW. Filter replacement interval – 2 months (at normal conditions).



TECHNICAL CHARACTERISTICS

- Power input: 220 V, 50 Hz
- Operating temperature range: -10 °C ÷ +55 °C
- Overall dimensions: 389×260×304 mm, weight: 15.6 kg
- Overall dimensions (with BN-01 pumping unit): 595×1054×394 mm, weight: 38 kg
- IP65 wall-mount (frame-mount) enclosure
- Relay output: up to 5

Compliance with Standards:

- IEC 60761-1, IEC 60761-2, IEC 61172, IEC 61578, IEC 60980

Versions:

- stationary;
- stationary with BN-01 pumping unit;
- mobile with BN-01 pumping unit.

Energy range of detected Alpha radiation:

3.0 ÷ 9.0 MeV

Energy range of detected Beta radiation:

0.05 ÷ 3.0 MeV

Measurement range of volumetric activity caused by alpha emitting nuclides:

$1 \cdot 10^{-2} \div 2 \cdot 10^5$ Bq/m³

Measurement range of volumetric activity caused by beta emitting nuclides:

$1 \cdot 10^{-1} \div 1 \cdot 10^7$ Bq/m³





UDI-1B

IODINE MONITOR



Automated continuous monitoring of volumetric activity of gamma emitting nuclides of Iodine (I-131, I-132, I-133, I-135) in occupational air and ventilation ducts and pipes of nuclear, chemical and general industry facilities.

FEATURES

- Two scintillator detectors (one for measuring, one for gamma background compensation).
- Sound alarm: 85 ÷ 100 dB on 1 m distance. Sound muting button.
- Visual alarm: green – yellow – red lights.
- Four lines local display representing measured parameters and current status.
- Provision to connect BAS-type external alarm unit.
- Control of external units such as electromagnetic valves, pumps, etc. (up to 5 relay outputs).
- Communication with upper level control systems via Ethernet and RS-485.
- 4-20 mA analog output (optional).
- Parameters configuration, alarm thresholds setting and archive reading via connected PC using the “Configurator” software (RS-232 interface).
- Periodic functional tests using check source.
- Internal air-flow meter to measure the volume of air pumped through the filter.
- Unattended mode of operation, except the filter replacement.
- Filter type: sorbent cartridge. Filter replacement interval – 3 months (at normal conditions).

GAS-AEROSOL EMISSION MONITORING

TECHNICAL CHARACTERISTICS

- Power input: 220 V, 50 Hz
- Operating temperature range: -10 °C ÷ +55 °C
- Overall dimensions: 437×307×474 mm, weight: 29.5 kg
- Overall dimensions (with BN-01 pumping unit): 595×1054×394 mm, weight: 52 kg
- IP65 wall-mount (frame-mount) enclosure

Compliance with Standards:

IEC 60761-1, IEC 60761-4, IEC 61171

Versions:

- stationary;
- stationary with BN-01 pumping unit;
- mobile with BN-01 pumping unit.

Energy range of detected gamma emission:

- 60 ÷ 3000 keV.

TWO MODES OF MEASURING (PERFORMED SIMULTANEOUSLY):

Measurement range of volumetric activity:

- real time data (instant value, sampling rate: 20 ÷ 600 seconds):
 $3.7 \div 3.7 \cdot 10^6 \text{ Bq/m}^3$
- accumulation mode (volumetric activity accumulation time – up to 24 hours):
 $3.0 \cdot 10^{-2} \div 3.7 \cdot 10^6 \text{ Bq/m}^3$





UDG-1B

NOBLE GAS MONITOR



Automated continuous monitoring of volumetric activity of beta emitting gases (Argon, Krypton, Xenon) in occupational air and ventilation ducts and pipes of nuclear, chemical and general industry facilities.

FEATURES

- Two silicon detectors (one for beta activity measuring, one for gamma background compensation).
- Parameters configuration, alarm thresholds setting and archive reading via connected PC using the "Configurator" software (RS-232 interface).
- Sound alarm: 85 ÷ 100 dB on 1 m distance. Sound muting button.
- Visual alarm: green – yellow – red lights.
- Provision to connect BAS-type external alarm unit.
- Local display representing measured parameters and current status.
- Communication with upper level control systems via Ethernet and RS-485.
- Up to 3 relay outputs.
- 4-20 mA analog output (optional).
- Periodic functional tests using check source.
- Unattended mode of operation.
- Inlet air filter AFA-type to prevent dust and aerosol particles to get into the detector chamber.

Energy range of detected beta emitting gases:

80 ÷ 3000 keV

Measurement range of volumetric activity of beta emitting gases:

$1.0 \cdot 10^4 \div 3.7 \cdot 10^{10}$ Bq/m³

GAS-AEROSOL EMISSION MONITORING

TECHNICAL CHARACTERISTICS

- Power input: 220 V, 50 Hz
- Operating temperature range: -10 °C ÷ +55 °C
- Overall dimensions: 395×240×304 mm, weight: 18 kg
- Overall dimensions (with BN-01 pumping unit): 595×1054×394 mm, weight: 42 kg
- IP65 wall-mount (frame-mount) enclosure

Compliance with Standards:

- IEC 60761-1, IEC 60761-3, IEC 62302

Versions:

- stationary;
- stationary with BN-01 pumping unit;
- mobile with BN-01 pumping unit.





UPPVM

AIRFLOW PARAMETERS MONITOR

Measuring of air-stream velocity, air temperature, air humidity and air-flow rate in ventilation ducts and pipes of nuclear, chemical and general industry facilities. An integrated part of SKGAV stack monitor.

Standard UPPVM monitor configuration:

- Air-stream velocity unit (air-stream probe + interface box)
- Temperature and humidity unit (temperature and humidity probe + interface box)
- BOP-1S data processing and transmission unit

FEATURES

Parameters configuration and archive reading via connected PC using the "Configurator" software.

Communication with upper level control systems via Ethernet, RS-232 and RS-485.

Unattended mode of operation as a part of gas-aerosol online emission monitoring system.

Measuring range of air-stream velocity:

- 1.0 ÷ 20.0 m/s

Measuring range of air temperature:

- 0 ÷ +80 °C

Measuring range of air humidity:

- 10 ÷ 95 %

Air-flow rate is a target value calculated upon the air-stream velocity and the geometry of a particular ventilation system.

TECHNICAL CHARACTERISTICS

- Power input, BOP-1S: 220 V, 50 Hz
- Operating temperature range (BOP-1S and interface boxes): -10 °C ÷ +50 °C
- Overall dimensions, BOP-1S: 280×233×111 mm, weight: 8 kg
- IP65 enclosure (BOP-1S and interface boxes)

Compliance with Standards:

ISO 2889





Providing air from occupational areas and ventilation ducts and pipes to gas-aerosol volumetric activity monitors. Extra option to SKGAV stack monitor (if there are no regular pumping units embedded into a facility ventilation system).

FEATURES

All controls via the connected volumetric activity monitor (model UDA-1AB, UDI-1B, UDG-1B or other models manufactured by DOZA).

Automatic switch off when the connected monitor is off (e.g. for filter replacement).

Unattended mode of operation, easy maintenance, no lubrication required.

Normal-pressure air capacity:

- 2.4 ÷ 3.0 m³/h

Temperature of pumping air:

- -10 °C ÷ +50 °C

Humidity of pumping air:

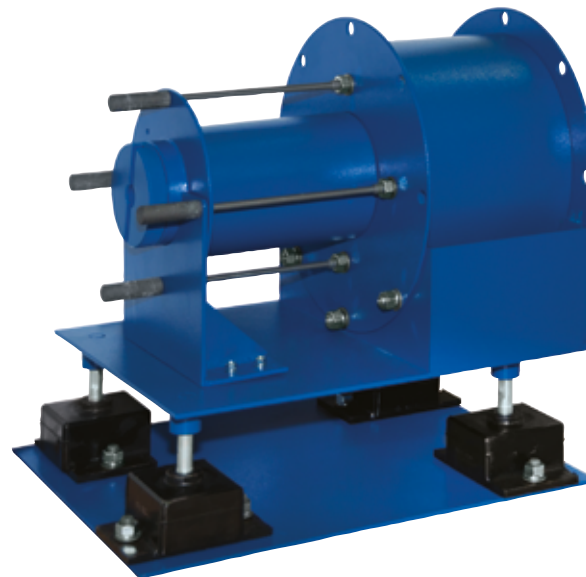
- up to 98 % at +35 °C temperature

TECHNICAL CHARACTERISTICS

- Power input: 220 V, 50 Hz
- Overall dimensions and weight:
 - Mobile version, on wheels: 472×343×975 mm, 23 kg
 - Wall-mount version (with mounting brackets): 540×410×365 mm, 25 kg



PROCESS STREAMS ACTIVITY MONITORING



Automated continuous monitoring of volumetric activity of gamma emitting nuclides in liquids, vapors and pulps in the pipelines and reservoirs of nuclear, chemical and general industry facilities. Leak monitoring from loop 1 (primary circuit) to loop 2 (secondary circuit) in a nuclear power plant. Effluent activity monitoring.

Depending on application the UDGP monitor may consist of: BDEG-03/ BGED-05 gamma detection units, BOP-1SP/BOP-1SPD local data processing and transmission units, collimator, flow chamber, drowned protective tube for BDEG-type gamma detectors, BAS-type external alarm unit, cables, junction boxes, mounting brackets, calibration units and other auxiliary equipment.



APPLICATION	DESIGN VERSION	MAIN PARTS
General volumetric activity monitoring and leak monitoring using collimator	basic	BDEG-03 40x100 gamma monitor, BOP-1SP data processing unit, collimator
Volumetric activity monitoring in pipelines using flow chamber	01	BDEG-03 40x60 gamma monitor, BOP-1SP data processing unit, flow chamber with flow meter
	09	BDEG-05 40x60 gamma monitor, BOP-1SPD data processing unit, flow chamber with flow meter
Volumetric activity monitoring in tanks and reservoirs	02	BDEG-03 40x60 gamma monitor, BOP-1SP data processing unit, drowned protective tube
	06	BDEG-05 40x60 gamma monitor, BOP-1SPD data processing unit
Volumetric activity monitoring in the steel 14 mm diameter pipelines	03	BDEG-03 40x60 gamma monitor, BOP-1SP data processing unit, collimator



UDGP-01

PROCESS STREAMS MONITOR

FEATURES

- Lead shielding in collimator and flow chamber to exclude gamma background radiation.
- Parameters configuration, alarm thresholds setting and archive reading via connected PC using the “Configurator” software (RS-232 interface).
- Sound alarm with sound muting button.
- Visual alarm: green – yellow – red lights.
- Provision to connect BAS-type external alarm unit.
- Local display representing measured parameters and current status (BOP-1SPD).
- Communication with upper level control systems via Ethernet and RS-485.
- Up to 3 relay outputs.
- 4-20 mA analog output (optional).
- IP65 enclosure protection rating.

Measurement range of volumetric activity of:

- low-energy gamma emitting nuclides with the use of flow chamber or drowned protective tube with steel wall less than 3 mm thickness: $4.0 \cdot 10^2 \div 4.0 \cdot 10^8$ Bq/m³
- low-energy gamma emitting nuclides with the use of collimator: $3.7 \cdot 10^3 \div 3.7 \cdot 10^8$ Bq/m³
- low-energy gamma emitting nuclides with the use of collimator for steel pipe 14 mm diameter, 2 mm wall thickness, on the distance of 200 mm from the pipe centerline: $3.7 \cdot 10^7 \div 3.7 \cdot 10^{13}$ Bq/m³
- high-energy gamma emitting nuclides (including 16N) with the use of collimator for steel pipe 600 mm diameter, 22 mm wall thickness, on the distance of 100 mm from the pipe edge: $3.7 \cdot 10^7 \div 3.7 \cdot 10^{13}$ Bq/m³

Energy range of detected low-energy gamma emitting nuclides:

50 ÷ 3000 keV

Energy range of detected high-energy gamma emitting nuclides, including 16N:

5000 ÷ 7200 keV

PROCESS STREAMS ACTIVITY MONITORING

TECHNICAL CHARACTERISTICS

UDGP-01 PARTS	OPERATING TEMPERATURE RANGE	DIMENSIONS	WEIGHT
BDEG-03 40×60	-10 °C ÷ +80 °C	Ø62×315 mm	1.4 kg
BDEG-03 40×100	-10 °C ÷ +80 °C	Ø62×355 mm	1.7 kg
BDEG-05 40×60	-10 °C ÷ +55 °C	Ø62×215 mm	1.2 kg
BOP-1SP/1SPD	-10 °C ÷ +55 °C	300×220×114 mm	4.6 kg
Collimator		Ø350×455 mm	150 kg
Flow chamber		1100×500×400 mm	410 kg

Compliance with Standards: IEC 60951-4, "Monitoring of radioactivity in process streams"

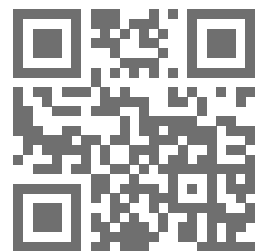


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