AT1117M Radiation Monitor
(Hand and coat surface contamination monitors)

Purpose

This radiation monitor configuration can be used to:

- Measure flux density and surface activity of ^{239}Pu alpha particles with BDPA-02 / BDPA-03

- Measure beta flux density and surface activity of ^{90}Sr+^{90}Y with BDPB-02 / BDPB-03.

PU2 processing unit features integrated detection module, allowing in situ measurement of gamma radiation ambient dose equivalent dose and ambient dose equivalent rate.

Radiation monitor can be operated both as fixed and portable instrument. In fixed version all probes are attached to a wall-mounted bracket and can be easily removed without special tools to be used as a portable variant.

Operating principle

Monitor's operating principle is based on highly sensible scintillation measurement method with ZnS(Ag) detector for alpha radiation detection units and plastic detector for beta radiation detection units.

Detection unit sends data to PU2 processing unit, where it is displayed on a big LCD screen. Operator can manually record measurement results.

Operation algorithm provides measurement continuity and real time statistical processing of measurement results.

Components:

- **Alpha/beta radiation detection unit** *(can be selected):*
  BDPA-02 *(α)* **/ BDPA-03** *(α)*
  BDPB-02 *(β)* **/ BDPB-03** *(β)*
- **PU2 Processing unit**
- **Cable** *(connects detection unit to PU2)*
- **Wall bracket**

Application

- Dosimetric and radiometric monitoring in Nuclear Power Plants, manufacturing facilities, research laboratories, medical institutions, etc

Features

- High sensitivity
- Quick response to changes in radiation environment
- Wide measurement range
- Integrated stabilisation and continuous performance monitoring systems
- Sound, light and visual alarm for exceeded threshold levels
- Measurement results can be written and stored in non-volatile memory of Radiation monitor
- Operation in harsh weather conditions

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Specifications

Processing unit	PU2
Registered radiation	Gamma radiation (γ)
Detector	Geiger-Muller counter tube
Energy range	60 keV – 3 MeV
Measurement range of ambient radiation dose equivalent rate	1 μSv/h – 100 mSv/h
Measurement range of ambient radiation dose equivalent	1 μSv – 1 Sv
Limits of tolerable intrinsic relative error	±20%
Typical sensitivity to ^{137}Cs gamma radiation	1.0 cps/(μSv·h^{-1})
Response time for dose rate change from 10 to 100 μSv/h	≤2 s
Energy dependence relative to 662 keV (^{137}Cs)	-25% to +35% (for 60 keV – 3 MeV energy range)
Protection class	IP64
Power supply	1) By integrated rechargeable battery pack 2) By external 230 VAC, 50 Hz power source 3) By external 12 VDC power source 4) By external battery
Continuous operation time	≥24 h
Overall dimensions, weight	210x88x36 mm, 0.6 kg

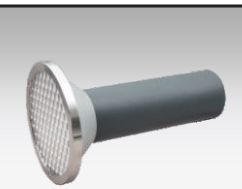
AT1117M Radiation monitor: General characteristics	
Connection interface of detection unit to PU2	RS232
Burn-up life	≥100 Sv
Operation temperature range	from -40°C to +50°C
Relative air humidity with air temperature ≤35°C without condensation	≤95%

Wall bracket

Dimensions:
296x175 mm

Weight:
1.4 kg

Supplied with all attachment hardware

Detection units	BDPA-02	BDPA-03	BDPB-02	BDPB-03
Registered radiation	Alpha radiation (α)	Alpha radiation (α)	Beta radiation (β)	Beta radiation (β)
Scintillation detector	ZnS(Ag), 100 cm^2	ZnS(Ag), 300 cm^2	Plastic, 100 cm^2	Plastic, 300 cm^2
Energy range	4 – 7 MeV	4 – 7 MeV	155 keV – 3.5 MeV	155 keV – 3.5 MeV
Measurement range of alpha particles flux density	0.05 – 5·10^4 particle·min^{-1}·cm^{-2}	0.05 – 2·10^4 particle·min^{-1}·cm^{-2}	–	–
Measurement range of ^{239}Pu surface activity	1.7·10^{-3} – 1.7·10^3 Bq·cm^{-2}	1.7·10^{-3} – 0.68·10^3 Bq·cm^{-2}	–	–
Typical sensitivity to ^{239}Pu alpha radiation	0.7 cps/(particle·min^{-1}·cm^{-2})	2.5 cps/(particle·min^{-1}·cm^{-2})	–	–
Measurement range of beta particles flux density	–	–	0.5 – 1.5·10^5 particle·min^{-1}·cm^{-2}	0.5 – 0.5·10^5 particle·min^{-1}·cm^{-2}
Measurement range of ^{90}Sr + ^{90}Y surface activity	–	–	2.2·10^{-2} – 0.66·10^4 Bq·cm^{-2}	2.2·10^{-2} – 0.22·10^4 Bq·cm^{-2}
Typical sensitivity to ^{90}Sr + ^{90}Y beta radiation	–	–	0.9 cps/(particle·min^{-1}·cm^{-2})	2.4 cps/(particle·min^{-1}·cm^{-2})
Limits of tolerable intrinsic relative error	±20%	±20%	±20%	±20%
Protection class	IP64	IP64	IP64	IP64
Power supply	By PU2	By PU2	By PU2	By PU2
Overall dimensions, weight	Ø137x230 mm, 0.7 kg	Ø222x277 mm, 1.4 kg	Ø137x235 mm, 0.87 kg	Ø222x281 mm, 1.8 kg
Outside appearance				

Design and specifications are subject to change without notice

The radiation monitor complies with: GOST 27451-87, Safety requirements of IEC 61010-1:2010, EMC requirements of EN 55011:2009, IEC 61000-4-2:2008, IEC 61000-4-3:2008

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