

AT1117M

RADIATION MONITOR

alpha, beta, x-ray,
gamma and neutron radiation

Portable combined high-sensitive accurate instrument to measure ambient x-ray, gamma and neutron radiation dose equivalent and dose equivalent rate, alpha and beta radiation flux density from contaminated surfaces and alpha and beta radiation surface activity and neutron radiation flux density.

Features

- Multifunctionality
- High sensitivity and wide measuring ranges
- Fast response to radiation field change
- Alpha, beta, gamma, x-ray and neutron radiation source search
- Smart probes (RS232 interface)
- Built-in LED stabilization system
- Audible and visual alarm at dose, dose rate and flux density threshold exceeding
- Field operation in a wide temperature range
- Large backlit LCD
- Logging and transfer to PC up to 100 measurement results
- Two alternative processing units: PU and PU2



**BDPA-01
BDPB-01**



α,β

BDPS-02



α,β,X,γ

BDKN-01



n

BDKN-03



n

BDKN-05



n

**PU2 with
telescopic bar
up to 3 m**



BDKR-01



X

BDKG-01



γ

BDKG-03



γ

BDKG-04



X,γ

BDKG-05



γ

BDKG-17



γ

The radiation monitor AT1117M is a multifunctional portable instrument with digital readout consisting of the processing unit (PU and/or PU2) with an internal Geiger-Muller tube and external smart probes BDPA-01, BDPB-01, BDPS-02, BDKN-01, BDKN-03, BDKN-05, BDKR-01, BDKG-01, BDKG-03, BDKG-04, BDKG-05 and BDKG-17. Smart probes BDKG-01, BDKG-03, BDKG-05, BDKG-17 can be placed in a hermetic container to be submerged.



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**INSTRUMENTS AND TECHNOLOGIES FOR
NUCLEAR MEASUREMENTS AND RADIATION MONITORING**

Specification

Dose rate measuring range

ambient dose equivalent rate

X-ray and gamma radiation

PU, PU2 (G-M counter)	10 μ Sv/h - 100 mSv/h
BDKR-01 (NaI(Tl) \varnothing 9x2 mm)	0.05 - 100 μ Sv/h
BDKG-01 (G-M counter)	0.1 μ Sv/h - 10 Sv/h
BDKG-03 (NaI(Tl) \varnothing 25x40 mm)	0.03 - 300 μ Sv/h
BDKG-04 (scintillation plastic \varnothing 30x15 mm)	0.05 μ Sv/h - 10 Sv/h
BDKG-05 (NaI(Tl) \varnothing 40x40 mm)	0.03 - 100 μ Sv/h
BDKG-17 (G-M counter)	1 mSv/h - 100 Sv/h
BDPS-02 (G-M counter)	0.1 μ Sv/h - 30 mSv/h
neutron radiation	
BDKN-01 (from Pu-Be sources)	0.1 μ Sv/h - 10 mSv/h
BDKN-03 (0.025 eV - 14 MeV)	0.1 μ Sv/h - 10 mSv/h
exposure dose rate X-ray and gamma radiation	
BDKG-03 (NaI(Tl) \varnothing 25x40 mm)	3 μ R/h - 10 mR/h

Dose measuring range

ambient dose equivalent

X-ray and gamma radiation

PU, PU2	10 μ Sv - 1 Sv
BDKR-01	0.05 μ Sv - 5 mSv
BDKG-01	0.1 μ Sv - 10 Sv
BDKG-03	0.03 μ Sv - 1 Sv
BDKG-04	0.05 μ Sv - 10 Sv
BDKG-05	0.03 μ Sv - 0.3 mSv
BDKG-17	1 μ Sv - 1 Sv
BDPS-02	0.1 μ Sv - 10 Sv
neutron radiation	
BDKN-01 (from Pu-Be sources)	0.1 μ Sv - 10 Sv
BDKN-03 (0.025 eV - 14 MeV)	0.1 μ Sv - 10 Sv
exposure dose rate X-ray and gamma radiation	
BDKG-03	3 μ R - 100 R

Neutron flux density measuring range

BDKN-01, BDKN-03 (He-3 counter)	0.1 - 10 ⁴ neutron/(s·cm ²)
BDKN-05 (2 He-3 counters)	0.1 - 5·10 ³ neutron/(s·cm ²)

Flux density measuring range

alpha radiation from contaminated surface	
BDPA-01 (ZnS(Ag) \varnothing 60 mm)	0.1-10 ⁵ part./(min·cm ²)
BDPS-02	2.4 - 10 ⁵ particle/(min·cm ²)
beta radiation from contaminated surface	
BDPB-01 (plastic \varnothing 60 mm)	1 - 5·10 ⁵ part./(min·cm ²)
BDPS-02	6 - 10 ⁵ particle/(min·cm ²)

Surface activity measuring range

alpha radiation (²³⁸ Pu) BDPA-01	3.4·10 ⁻³ - 3.4·10 ³ Bq·cm ⁻²
beta radiation (⁹⁰ Sr+ ⁹⁰ Y) BDPB-01	4.4·10 ⁻² - 2.2·10 ⁴ Bq·cm ⁻²

Energy range of detecting x-ray and gamma radiation

BDKR-01	5 - 160 keV
PU, PU2, BDKG-01, BDKG-17	60 keV - 3 MeV
BDKG-04	15 keV - 3 MeV
BDKG-03, BDKG-05	50 keV - 3 MeV
BDPS-02	20 keV - 3 MeV

Energy range of detecting alpha radiation

BDPS-02	4 - 7 MeV
BDPA-01	3 - 7 MeV

Energy range of detecting beta radiation

BDPS-02, BDPB-01	155 keV - 3,5 MeV
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Energy range of detecting neutron radiation

BDKN-01, BDKN-03, BDKN-05	0.025 eV - 14 MeV
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Energy sensitivity response

at dose rate measuring	
respect to ¹³⁷ Cs	not less than +35 ÷ -25 %
at flux density measuring	
respect to ⁹⁰ Sr+ ⁹⁰ Y	not less than ±50%

Intrinsic measurement error

dose rate and flux density not less than ±20 %

Sensitivity

to gamma radiation on ¹³⁷Cs

PU, PU2	0.3 cps/ μ Sv·h ⁻¹
BDKG-01	4.0 cps/ μ Sv·h ⁻¹
BDKG-03	350 cps/ μ Sv·h ⁻¹
BDKG-04	70 cps/ μ Sv·h ⁻¹
BDKG-05	900 cps/ μ Sv·h ⁻¹
BDKG-17	1.1 cps/ mSv·h ⁻¹
BDPS-02	6.6 cps/ μ Sv·h ⁻¹

to gamma radiation on ²⁴¹Am

BDKR-01	400 cps/ μ Sv·h ⁻¹
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to alpha radiation on ²³⁸Pu

BDPA-01	0.15 cps/(particle·min ⁻¹ ·cm ²)
BDPS-02	0.015 cps/(particle·min ⁻¹ ·cm ²)

to beta radiation on ⁹⁰Sr+⁹⁰Y

BDPB-01	0.3 cps/(particle·min ⁻¹ ·cm ²)
BDPS-02	0.12 cps/(particle·min ⁻¹ ·cm ²)

to alpha radiation on Pu-Be sources

BDKN-01	1.15 cps/(neutron·s ⁻¹ ·cm ²)
BDKN-03	1.5 cps/(neutron·s ⁻¹ ·cm ²)
BDKN-05	9 cps/(neutron·s ⁻¹ ·cm ²)

Operating temperature range -30 ÷ +50°C

Relative air humidity at 35°C 95 %

Protection class IP64

Power requirements

internal Ni-Mh accumulator unit	6 V
AC mains, frequency 50 Hz	220 V
DC supply	12 V

Continuous operation time

from AC mains or DC supply not less than 24 h
from one fully charged accumulator unit not less than 24 h

Radio disturbance

EN 55022:2006

Electromagnetic compatibility

EN 61000-4-2:1995
EN 61000-4-3:2002

Weight, not more than

PU	1.1 kg
PU2, BDPA-01, BDPB-01, BDKR-01, BDKG-04	0.5 kg
BDPS-02, BDKG-17	0.3 kg
BDKG-01	0.4 kg
BDKG-03	0.6 kg
BDKG-05	1.2 kg
BDKN-01	2.0 kg
BDKN-03	7.8 kg
BDKN-05	3.4 kg

Dimensions, not more than

PU	177x85x124 mm
PU2	200x85x36 mm
BDPS-02	138x86x60 mm
BDPA-01, BDPB-01	\varnothing 80x196 mm
BDKG-01	\varnothing 54x255 mm
BDKR-01	\varnothing 60x260 mm
BDKG-03	\varnothing 60x295 mm
BDKG-04	\varnothing 60x200 mm
BDKG-05	\varnothing 60x320 mm
BDKG-17	\varnothing 54x167 mm
BDKN-01	\varnothing 90x290 mm
BDKN-03	314x220x263 mm
BDKN-05	375x110x100 mm

Complete set: processing unit PU or/and PU2, smart probes (the number is on customer's order), AC adapter, shoulder strap, waist belt, manual and packing case.

The set of cables and applied software to connect PU to PC; telescopic bar 1.1 m or 3 m with an internal cable, head-phones, kit of accessories to connect smart probes to PC and applied software are options and they are supplied on **additional order**.

The radiation monitor AT1117M has pattern approval certificates of Republic of Belarus, Russian Federation, Ukraine and Kazakhstan. It complies with IEC 60846, IEC 60325 and IEC 61005 International standard requirements.

**5, Gikalo st., 220005 Minsk,
Republic of Belarus**

tel. +375 17 2928142

tel. / fax +375 17 2928142, 2882988

e-mail: info@atomtex.com

http://www.atomtex.com



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