

AT1121, AT1123

X-ray and gamma radiation dosimeters

**Photon radiation
energy range
15 keV ... 10 MeV**

Portable multifunctional wide-range instruments for X-ray and gamma radiation dosimetry of the following types:

- Continuous long-term radiation
- Continuous short-term radiation
- Impulse radiation [AT1123]

Operating principle

Main function of the dosimeter is the measurement of X-ray and gamma radiation within wide ranges of ambient dose equivalent rate and energy. Additional functions: detecting soft and hard gamma and beta radiation sources, measuring pulsed and short-term radiation with exposure time assessment, and detecting moving sources as well.

Dosimeters automatically save maximum dose rate value for the time of operation and are able to store up to 999 measurement results in non-volatile memory for a long time and to subsequently transfer this data to PC.

Continuous performance self-testing is done during operation.

External control unit and external alarm unit can be attached to dosimeters for remote monitoring application.



*Dosimeter with external control
and external alarm units*

Radiation type	AT1121		AT1123	
	$\dot{H}^*(10)$	$H^*(10)$	$\dot{H}^*(10)$	$H^*(10)$
X-ray	+	+	+	+
Gamma	+	+	+	+
Bremsstrahlung	+	+	+	+
Continuous long-term	+	+	+	+
Continuous short-term	+	+	+	+
Pulsed	-	-	+	+
Beta (detection)	+	+	+	+

Applications

- X-ray diagnostics
- Nuclear medicine
- Radiology
- X-ray and gamma-ray flaw detection
- X-ray and gamma-ray testing
- Search X-ray and accelerating apparatus
- Radiation accidents
- Radiation monitoring
- Nuclear industry
- Accelerating installations
- Research activities

Features

- Tissue-equivalent detector - scintillation plastic
- High sensitivity results in rapid measurements with good statistical confidence
- Wide measurement range with 8 orders of magnitude and more
- Wide energy range starting from 15 keV
- Measurement of short-term exposure dose rate and time (from 0.03 s) for continuous radiation
- Measurement of average dose rate of impulse radiation with duration from 10 ns [AT1123]
- Large dedicated digital/analogue LCD screen with backlighting
- Integrated system for LED measurement path stabilization
- Sound and visual alarm in case threshold level is exceeded
- External control panel can be used for remote measurement
- Fixed installation option with external audio-visual alarm with four groups of potential-free contacts for actuator control
- Connection to PC is available in order to create a continuous monitoring system with documenting function
- Three types of power sources
- Severe operating conditions



ATOMTEX

INSTRUMENTS AND TECHNOLOGIES FOR NUCLEAR
MEASUREMENTS AND RADIATION MONITORING

AT1121, AT1123

X-ray and gamma radiation dosimeters

Specification

Detector	Scintillation plastic, Ø30x15 mm
Ambient dose equivalent rate measurement range	
Continuous long-term radiation AT1121, AT1123	50 nSv/h ... 10 Sv/h
Continuous short-term radiation AT1121, AT1123	5 µSv/h ... 10 Sv/h
Impulse radiation AT1123	0.1 µSv/h ... 10 Sv/h
Ambient dose equivalent measurement range	10 nSv ... 10 Sv
Energy range	
Continuous long-term and short-term radiation	15 keV ... 10 MeV
Impulse radiation (AT1123)	15 keV ... 10 MeV
Energy dependence relative to 662 keV (¹³⁷Cs)	
15 ... 60 keV (with protection cap "0.025 – 3 MeV")	±35%
60 keV ... 3 MeV (with protection cap "0.025 – 3 MeV")	±25%
60 keV ... 10 MeV (with protection cap "0.06 – 10 MeV")	±25%
10 ... 20 MeV * (with protection cap "0.06 – 10 MeV")	-50% max.
Minimum duration of impulse radiation for impulse dose rate 1.3 Sv/s (AT1123)	10 ns
Minimum duration of continuous short-term radiation	0.03 s
Intrinsic relative measurement error	
Continuous long-term and short-term radiation	±15% max.
Impulse radiation (AT1123)	±30% max.
Sensitivity to ¹³⁷Cs gamma radiation	70 cps/µSv·h ⁻¹
Response time for dose rate change from 0.1 to 1 µSv/h (accuracy error ≤±10%)	<2 s
Time of ¹³⁷Cs gamma radiation dose rate measurement with statistical error ±15% (P=0.95) for the following dose rate:	
50 nSv/h	≤60 s
0.3 µSv/h	≤10 s
over 2 µSv/h (Up to 10 Sv/h)	≤2 s
Sensitivity to associated beta radiation of ⁹⁰ Sr + ⁹⁰ Y with filter (with protection cap "0.06 – 10 MeV") at 5 cm distance	3·10 ⁻⁷ µSv·h ⁻¹ ·Bq ⁻¹
Burn-up life	≥100 Sv
Operation mode setup time	1 min
Power supply and continuous run time	
Alternate or direct current mains	≥24 h
Internal battery	
AT1121	≥24 h
AT1123	≥12 h
Protection class	IP54

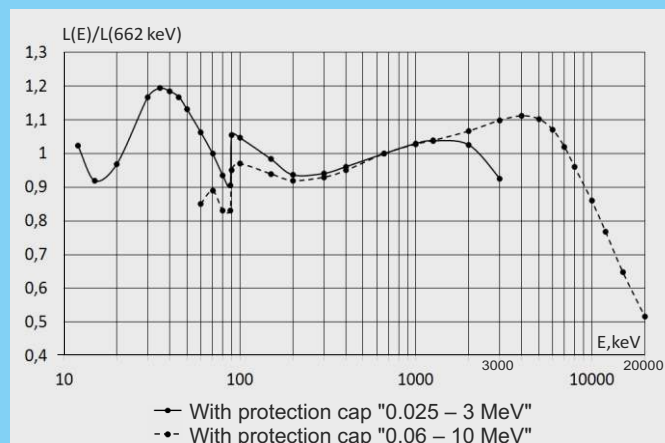
Design and specifications are subject to change without notice

Working temperature range -30°C ... +50°C

Relative humidity with air temperature ≤95%
≤35°C without condensation

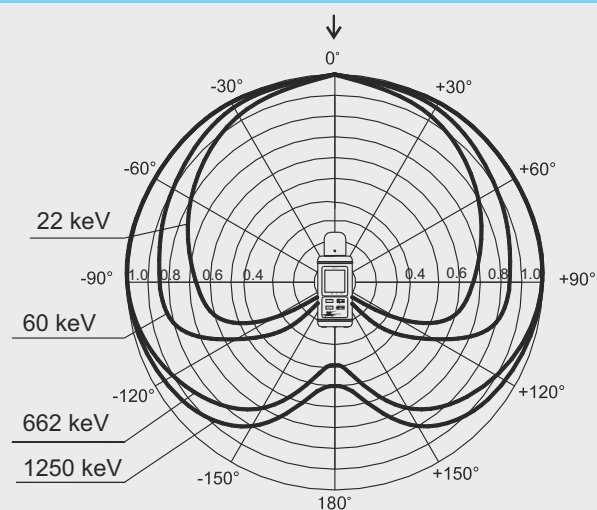
Overall dimensions 233x85x67 mm

Weight 0.9 kg



Normal energy dependence relative to 662 keV (¹³⁷Cs)

(*Energy dependence in 10 ... 20 MeV range is based on Monte Carlo method and is for reference only)



Normal dosimeter anisotropy for horizontal plane

The X-ray and gamma radiation dosimeters meet
Safety standard requirements: IEC 61010-1:1990
EMC requirements: EN 55011:2009,
IEC 61000-4-2:2008, IEC 61000-4-3:2008,
IEC 61000-4-4:2004, IEC 61000-4-5:2005,
IEC 61000-4-6:2008, IEC 61000-4-11:2004

The X-ray and gamma radiation dosimeters have the
pattern approval certificates of Republic of Belarus,
Russian Federation, Kazakhstan, Ukraine, Lithuania,
Uzbekistan, Azerbaijan



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