



AT1121, AT1123 X-RAY and Gamma Radiation Dosimeters

Portable multifunctional wide-range instruments for continuous, short-term and pulsed X and gamma radiation dosimetry.

Description

Operating principle

The main dosimeter function is to measure pulsed, short-term and continuous X and gamma radiation within wide ranges of ambient dose equivalent rate and energy. Additional functions: detecting soft and hard gamma radiation sources, beta radiation sources, short-term and pulsed 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.

Dosimeters have a self-testing mode which is activated after switching-on as well as during dosimeter operation.

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

Application

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

Features

- Tissue-equivalent detector - scintillation plastic with heavy metal additive
- Measurement of short-term (from 30 ms - AT1121) and impulse (from 10 ns AT1123) radiation
- Exposure time assessment
- 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 is possible with alarm dosimeter functionality and remote control from the distance of up to 25 m
- Three types of power sources
- Severe operating conditions

The X-ray and gamma radiation dosimeters meet

International standard requirements: IEC 60846-1:2009

Safety standard requirements: IEC 61010-1:1990

EMC requirements: EN 55022:1998+A1:2000+A2:2003, EN 55024:1998+A1:2001+A2:2003,

IEC 61000-4-2:2001, IEC 61000-4-3:2008, IEC 61000-4-4:2004, IEC 61000-4-5:2005,

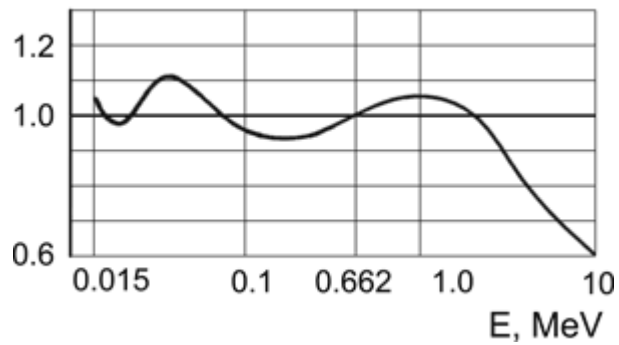
IEC 61000-4-6:2006, IEC 61000-4-11:2004

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

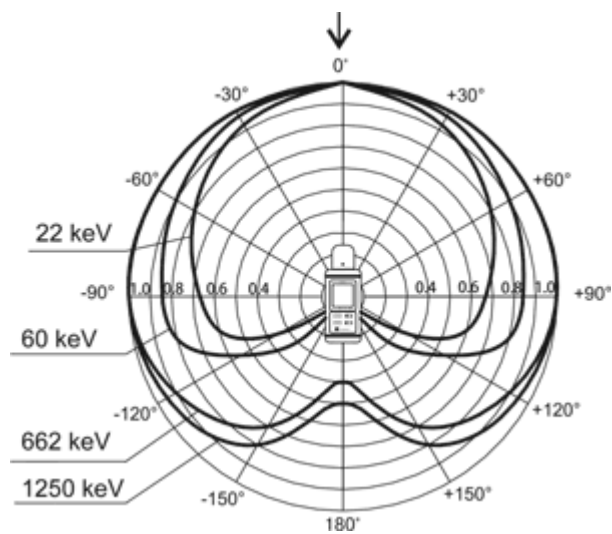
Application and capabilities

- Security
- Scientific Research
- Medicine
- Nuclear Industry

Features



Standard energy response of dosimeter sensitivity respect to ^{137}Cs gamma radiation of 662 keV



Standard dosimeter anisotropy for horizontal plane

Specification

Detector	Scintillation plastic, Ø30x15 mm
Measurement range of ambient radiation dose rate equivalent	
Continuous radiation AT1121, AT1123	50 nSv/h...10 Sv/h
Short-term radiation AT1121, AT1123	5 µSv/h...10 Sv/h
Impulse radiation AT1123	0.1 µSv/h...10 Sv/h

Measurement range of ambient radiation dose equivalent	10 nSv...10 Sv
Energy range	15 keV - 10 MeV
Energy dependence of sensitivity relating to ¹³⁷ Cs	
in the following range:	
15 keV...60 keV	±35%
60 keV...3 MeV	±25%
3 MeV...10 MeV	±50%
Minimum duration of impulse radiation for impulse	10 ns
dose rate 1.3 Sv/sec (AT1123)	
Minimum duration of short-term radiation	30 ms
Limit of intrinsic relative measurement error	
For continuous and short-term radiation	±15%
For impulse radiation	±30%
Sensitivity for ¹³⁷ Cs	70 cps/μSv·h ⁻¹
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

$\geq 2 \mu\text{Sv/h}$ (10 Sv/h max.)	$\leq 2 \text{ s}$
Sensitivity to associated beta radiation of $^{90}\text{Sr} + ^{90}\text{Y}$	$3 \cdot 10^{-7} \mu\text{Sv/h}^{-1} \cdot \text{Bq}^{-1}$
with a "0.06 - 10 MeV" cap at 5 cm distance	
Operation mode setup time	1 min
Power supply and continuous run time	
Alternate or direct current mains	At least 24 h
Internal battery	
AT1121	$\geq 24 \text{ h}$
AT1123	$\geq 12 \text{ h}$
Working temperature range	$-30^{\circ}\text{C} \dots +50^{\circ}\text{C}$
Relative humidity with air temperature $\leq 35^{\circ}\text{C}$ without condensation	$\leq 95\%$
Protection class	IP54
Overall dimensions, weight	233x85x67 mm, 0.9 kg