Radiation Dosimeters

Photon radiation energy range 15 keV - 10 MeV

	AT1121		AT1123	
Radiation	$\dot{H}^*(10)$	$H^*(10)$	$\dot{H}^*(10)$	$H^*(10)$
X-ray	+	+	+	+
Gamma	+	+	+	+
Bremsstrahlung	+	+	+	+
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

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

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

Dosimeter with external control unit

Dosimeter with external control and external alarm units

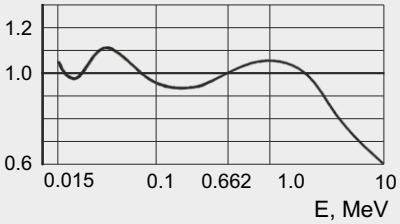
Features

- 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/analog 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
- Tree types of power sources
- Severe operating conditions

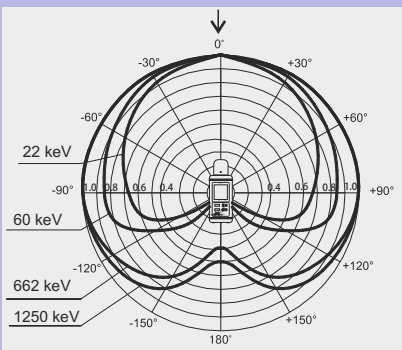
Radiation Dosimeters

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 dose rate 1.3 Sv/s (AT1123)	10 ns
Minimum duration of short-term radiation	30 ms
Intrinsic relative measurement error	
For continuous and short-term radiation	±15% max.
For impulse radiation	±30% max.
Sensitivity for ^{137}Cs	70 cps/μSv·h^{-1}
Time of ^{137}Cs 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 a "0.06 - 10 MeV" cap at a distance of 5 sm	3·10^{-7} μSv/h^{-1}·Bq^{-1}
Operation mode setup time	1 min.
Power supply and continuous run time	
Alternate or direct current mains	At least 24 h
Internal battery	
AT1121	At least 24 h
AT1123	At least 12 h
Working temperature range	-30°C to +50°C
Relative humidity with air temperature ≤35°C without condensation	Up to 95%
Protection class	IP54
Overall dimensions, weight	233x85x67 mm, 0.9 kg



Normal energy relationship between dosimeters sensitivity and ^{137}Cs gamma radiation energy of 662 keV



Normal dosimeter anisotropy for horisontal plane

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.

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