

# AT1121, AT1123

## X-ray and gamma radiation dosimeters

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

Radiation type	AT1121		AT1123	
	H*(10)	H*(10)	H*(10)	H*(10)
X-ray	+	+	+	+
Gamma	+	+	+	+
Bremsstrahlung	+	+	+	+
Continuous long-term	+	+	+	+
Continuous short-term	+	+	+	+
Pulsed	-	-	+	+
Beta (detection)	+	+	+	+

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

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

### Operating principle

The primary function of these dosimeters is the X-ray and gamma radiation dosimetry in wide ranges of ambient dose equivalent rate and energy. Additional functions are the detection of sources of soft and hard gamma radiation, beta emitters, measurement of pulsed and short-term radiation with exposure time estimation, as well as measurement of moving sources of radiation.

It is possible to select one of the four averaging modes during dose rate or dose measurement of continuous X-ray and gamma radiation to operate the dosimeter as a:

- Portable measuring device
- Instrument for laboratory measurements
- Instrument for fixed use
- Instrument for measurement of vehicles.

The dosimeters feature manual and automatic recording of measurement results with date and time into non-volatile memory (the "Notebook") with subsequent data transfer and processing in a PC. The manual mode can store up to 999 measurement results, the automatic mode – more than 500,000.

The dosimeters provide continuous and automatic health monitoring during operation.

Remote control and external alarm units can be attached to the dosimeters for remote monitoring applications.



### 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 pulse radiation with duration from 10 ns [AT1123]
- One of four available averaging modes is selectable
- Manual and automatic recording of measurement results with date and time into non-volatile memory is provided
- 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
- Remote control is available 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



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INSTRUMENTS AND TECHNOLOGIES FOR NUCLEAR  
MEASUREMENTS AND RADIATION MONITORING

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## X-ray and gamma radiation dosimeters

### Specification

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

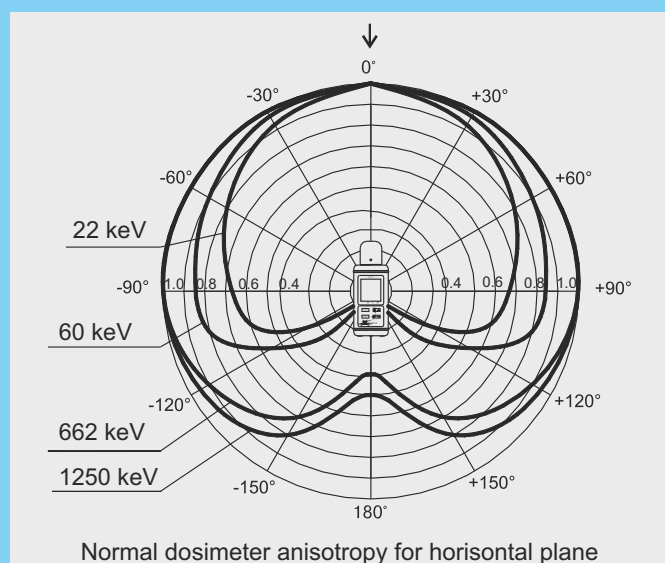
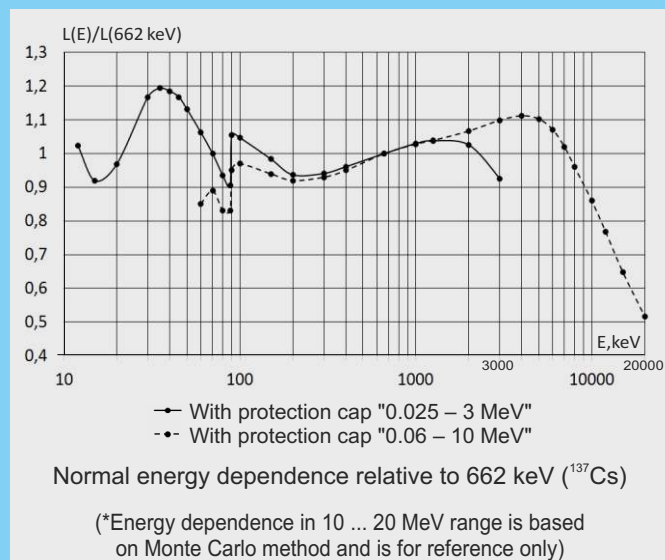
Design and specifications are subject to change without notice

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

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

**Overall dimensions** 233x85x67 mm

**Weight** 0.9 kg



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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