

AT3509, AT3509A, B, C Personal Dosimeters

Monitoring of individual exposure doses from X-ray and gamma radiation with energy range from 15 keV to 10 MeV



Pocket-size wide-range intelligent devices, ideally matching accuracy, functionality, user friendliness, reliability and price.

Dosimeter with reader, which is connected to PC, and software suite make an efficient automatic system for staff radiation exposure monitoring.

Operating principle

Primary dosimeter function is to measure Hp(10), Hp(0.07) individual dose equivalent, and the secondary one is to measure Hp(10), Hp(0.07) dose rate of continuous X-ray and gamma radiation.

Dosimeters provide dose range measurement in 7.5-order range and have individual sound and LED alarm function.

Microprocessor operation mode management, data processing, display on TFT screen and self-check function.

Accumulated dose data and dose accumulation history is saved in non-volatile memory when the device is powered off.

Measuring	AT3509 AT3509A	AT3509B AT3509C
Hp(10) continuous x & γ	+	+
$\dot{H}p(10)$ continuous x & γ	+	+
Hp(0.07) continuous x & γ	-	+
$\dot{H}p(0.07)$ continuous x & γ	-	+

Applications

- Radiation protective measures in case of nuclear disasters
- Roentgenology
- Therapeutic radiology
- Nuclear medicine
- Electronics (Ion implanters)
- Accelerating installations
- Nuclear research activities
- X-ray Crystallography and X-ray fluorescence spectroscopy, electronic microscopy

Features

- Silicone planar detector
- Zero intrinsic background
- Simultaneous measurement of visceral radiation exposure Hp(10) and skin radiation exposure Hp(0.07) - AT3509B and AT3509C in wide range of dose rates
- Compensating filter and electrical energy dependence correction
- Resistance to impacts and vibration, dust-and-moisture-proof, tolerance to electromagnetic interference
- Repeating impact protection (so called "Microphone effect")
- Parameter self-check
- Can be integrated into a system or used separately
- Low weight and small size
- Calibrated with water phantom
- ISO 30x30x15 cm
- Dosimeter-to-PC communication via IR-transmitter in reader



ATOMTEX®

INSTRUMENTS AND TECHNOLOGIES FOR NUCLEAR MEASUREMENTS AND RADIATION MONITORING

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Specification

Measurement range for:

Individual dose equivalent	
AT3509, AT3509A Hp(10)	1 μ Sv...10 Sv
AT3509B Hp(10), Hp(0.07)	1 μ Sv...10 Sv
AT3509C Hp(10), Hp(0.07)	1 μ Sv...10 Sv
Individual dose equivalent rate	
AT3509, AT3509A Hp(10)	0.1 μ Sv/h...1 Sv/h
AT3509B Hp(10), Hp(0.07)	0.1 μ Sv/h...1 Sv/h
AT3509C Hp(10), Hp(0.07)	0.1 μ Sv/h...5 Sv/h

Intrinsic relative error of dose measurement without associated beta radiation $\pm 15\%$ max.

Intrinsic relative error of dose rate measurement

0.1 μ Sv/h...1 μ Sv/h	$\pm 30\%$ max.
1 μ Sv/h...1 Sv/h	$\pm 15\%$ max.
1 Sv/h...5 Sv/h (AT3509C)	$\pm(15 + 0.001\dot{H}p)\%$ max., where Hp is dose rate in μ Sv/h

Calibration error for ^{137}Cs $\pm 5\%$

Energy range

AT3509, AT3509B,C	15 keV...10 MeV
AT3509A	30 keV...10 MeV

Sensitivity energy dependence

relating to 662 keV energy

Hp(10) in the following dose range	
15 keV...1.5 MeV	$\pm 25\%$
1.5 MeV...10 MeV	$\pm 60\%$
Hp(0.07) in the following dose range (AT3509B,C)	
15 keV...300 keV	$\pm 30\%$

Alarm thresholds

1 of 8 independent dose thresholds, 1 of 8 independent dose rate thresholds

Anisotropy in angular spacing $\pm 60^\circ$

For ^{137}Cs and ^{60}Co	$\pm 20\%$
For ^{241}Am	$\pm 50\%$

Response time for dose rate measurement (When dose rate is greater than 10 μ Sv/h) 5 s

Radiation overloading ≤ 10 Sv/h

Power 2 x AAA type batteries; rechargeable cells can be used

Continuous run time ≥ 500 h

Working temperature range $-10^\circ\text{C} \dots +40^\circ\text{C}$

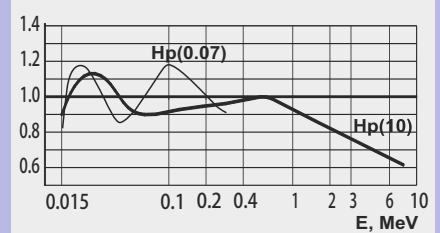
Relative air humidity with temperature $\leq 35^\circ\text{C}$ without moisture condensation $\leq 90\%$

Drop protection From ≤ 1.5 m to hard surface

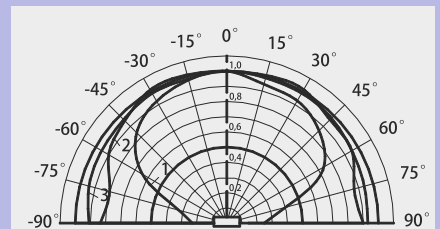
Protection class IP54

Connection to PC USB or RS232

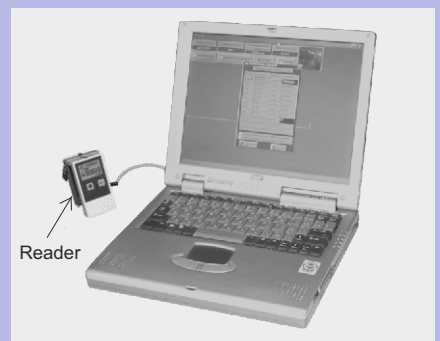
Overall dimensions, weight 105x58x23 mm, 100 g



Normal energy relationship between AT3509B Dosimeter sensitivity and ^{137}Cs gamma radiation energy of 662 keV



Normal AT3509 Dosimeter anisotropy for vertical position
1 - ^{241}Am ; 2 - ^{137}Cs ; 3 - ^{60}Co



The personal dosimeters meet International standard requirements: IEC 61526:2005 (confirmed by tests IAEA-EURADOS, IAEA-TECDOC-1564)
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

The personal dosimeters have the pattern approval certificates of Republic of Belarus, Russian Federation, Ukraine, Kazakhstan and Lithuania.