

AT3509, A, B, C Personal Dosimeters

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



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)
- Measurement in wide range of energies and 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

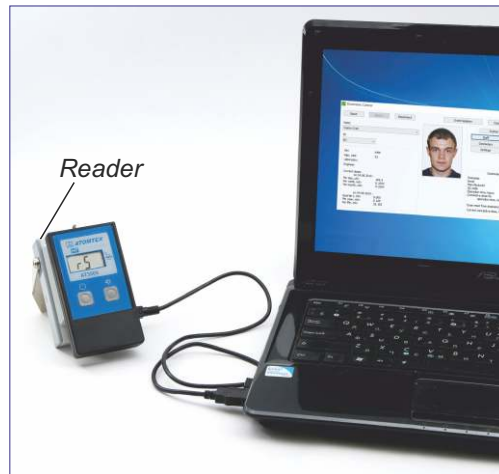
Pocket-size wide-range intelligent device is an ideal combination of accuracy, functionality, usability, reliability and price.

Dosimeters are designed for measurement of personal dose equivalent and personal dose equivalent rate of continuous X-ray and gamma radiation.

Dosimeter, PC-connectible reader and application software suite make an efficient automatic system for staff radiation exposure monitoring.

Operating principle

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	+	+
Ḣp(10) continuous x & γ	+	+
Hp(0.07) continuous x & γ	-	+
Ḣp(0.07) continuous x & γ	-	+



ATOMTEX®

INSTRUMENTS AND TECHNOLOGIES FOR NUCLEAR MEASUREMENTS AND RADIATION MONITORING

AT3509, A, B, C Personal Dosimeters

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 \dot{H}_p is dose rate in mSv/h

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

Energy range

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

Energy dependence relative to 662 keV (^{137}Cs)

Hp(10) in the following energy range	
15 keV...1.5 MeV	$\pm 25\%$
1.5 MeV...10 MeV	$\pm 60\%$

relative to 59.5 keV (^{241}Am)

Hp(0.07) in the following energy range	
15 keV...300 keV (AT3509B,C)	$\pm 30\%$

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 change ≤ 5 s

Radiation overloading ≤ 10 Sv/h

Burn-up life ≥ 100 Sv

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

Continuous run time ≥ 500 h

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

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

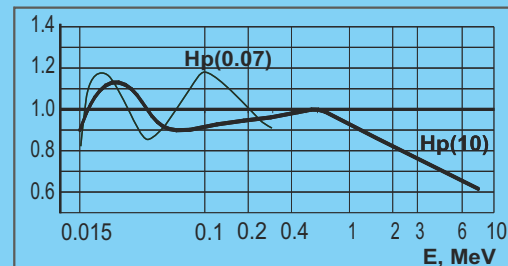
Drop protection From ≤ 1.5 m to hard surface

Protection class IP54

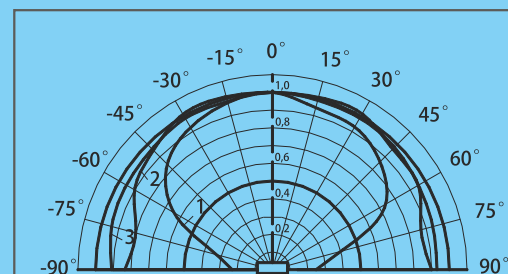
Connection to PC USB (via Reader)

Overall dimensions, weight 105x58x23 mm, 100 g

Design and specifications are subject to change without notice



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 61526:2010 (confirmed by tests IAEA-EURADOS, IAEA-TECDOC-1564)
Safety standard requirements: IEC 61010-1:2001
EMC requirements: IEC 61000-4-2:2008 IEC 61000-4-3:2008

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



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