

ÀÒ3509, ÀÒ3509À ÀÒ3509 Â, ÀÒ3509 C

PERSONAL DOSIMETER

Measuring	ÀÒ3509 ÀÒ3509À	ÀÒ3509Â ÀÒ3509Ñ
$\dot{I} p(10)$ continuous x è γ	+	+
$\dot{I} p(10)$ continuous x è γ	+	+
$\dot{I} p(0.07)$ continuous x è γ	-	+
$\dot{I} p(0.07)$ continuous x è γ	-	+

Hp(0.07), Hp(0.07) 15 keV - 300 keV
Hp(10), Hp(10) 15 keV - 10 MeV
1 µSv - 10 Sv 0.1 µSv/h - 5 Sv/h

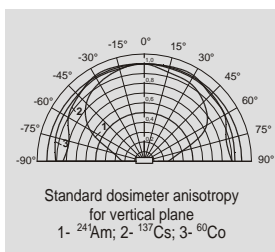
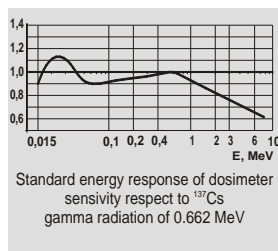
Features

- Silicon flat detector
- No proper background
- Simultaneous dose burden measuring on the inward parts of the body Hp(10), skin and mucous membranes Hp(0.07) - AT3509B and AT3509C
- Compensative filter and electronic energy response correction by 4-channel analog processor
- Proof against the microphonic effect
- Self-testing mode
- Possibility to use separately or in a system



Application

- Radiology
- Radiotherapy
- Nuclear medicine
- Accelerators
- Nuclear research
- Electronic equipment
- Special x-ray equipment



The dosimeters are intended to measure personal dose equivalent and dose equivalent rate x-ray and gamma radiation. They measure dose rate in a wide range and have separate audible and visual alarm. The microprocessor controls operation modes over, calculates, outputs data on a backlit LCD and performs self-testing. The nonvolatile memory keeps the accumulated dose and its accumulation history when the dosimeter is off. The dosimeter is calibrated on a water phantom of 30 x 30 x 15 cm meeting ISO4037-3 International standard requirements. The instruments are watertight, electromagnetic and shock-proof (fall from 1.5 m).



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The dosimeter can operate stand-alone or in a dosimetry control system: dosimeter - reader - PC. The dosimeter connects to the reader via IR channel, and the reader connects to PC via RS232. The dosimeter software is intended to:

- Read/setup personal and serial dosimeter numbers;
- Change dose and dose rate thresholds;
- Disable/enable to change dosimeter thresholds by the dosimeter button;
- Change the dose accumulation interval in the range from 1 to 255 min and evaluate accumulated dose for each time interval within a work shift;
- Save automatically up to 800 dose values in the nonvolatile memory accumulated for the selected accumulation interval;
- Reset accumulated dose;
- Disable/enable to reset accumulated dose by the dosimeter button;
- Save automatically data in the data base and print them.

The operation modes are "Dose", "Dose rate", "Economical", "Menu", "Reset dose", "Dose threshold", "Dose rate threshold", "data exchange with PC".

Specification

Measuring range

personal dose equivalent (in increment of 0.1 μSv)
 $\dot{A}03509, \dot{A}03509\dot{A}: \dot{I} \delta(10) \dots\dots\dots 1 \mu\text{Sv} - 10 \text{ Sv}$
 $\dot{A}03509\dot{A}: \dot{I} \delta(10), \dot{I} \delta(0,07) \dots\dots\dots 1 \mu\text{Sv} - 10 \text{ Sv}$
 $\dot{A}03509\dot{N}: \dot{I} \delta(10), \dot{I} \delta(0,07) \dots\dots\dots 1 \mu\text{Sv} - 10 \text{ Sv}$

personal dose equivalent rate
 $\dot{A}03509, \dot{A}03509\dot{A}: \dot{I} \delta(10) \dots\dots\dots 0.1 \mu\text{Sv/h} - 1 \text{ Sv/h}$
 $\dot{A}03509\dot{A}: \dot{I} \delta(10), \dot{I} \delta(0,07) \dots\dots\dots 0.1 \mu\text{Sv/h} - 1 \text{ Sv/h}$
 $\text{AT}3509\dot{N}: \dot{I} \delta(10), \dot{I} \delta(0,07) \dots\dots\dots 0.1 \mu\text{Sv/h} - 5 \text{ Sv/h}$

Intrinsic dose measurement

error with no accompanying
 beta radiation $\dots\dots\dots \pm 15\%$

Intrinsic dose rate measurement error

from 0.1 to 1 $\mu\text{Sv/h}$ $\dots\dots\dots \pm 30\%$
 from 1 $\mu\text{Sv/h}$ to 1 Sv/h $\dots\dots\dots \pm 15\%$
 from 1 Sv/h to 5 Sv/h (AT3509) $\dots\dots \pm (15 \cdot 0.0001 \cdot \dot{I} \delta)$

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

Energy range

$\dot{A}03509, \dot{A}03509\dot{A}$ and
 $\dot{A}03509\dot{N} \dots\dots\dots 15 \text{ keV} - 10 \text{ MeV}$
 $\dot{A}03509\dot{A} \dots\dots\dots 30 \text{ keV} - 10 \text{ MeV}$

Energy sensitivity response

$\dot{I} \delta(10)$
 from 15 keV to 1.5 MeV $\dots\dots\dots \pm 25\%$
 from 1.5 MeV to 10 MeV $\dots\dots\dots \pm 60\%$
 $\dot{I} \delta(0.07) \dot{A}03509\dot{A}, \text{AT}3509\text{C}$
 from 15 keV to 300 keV $\dots\dots\dots \pm 30\%$

Anisotropy within 75° angle

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

Alarm thresholds (independent)

dose 30 μSv ; 200 μSv ; 1 mSv; 4.2 mSv; 12.5 mSv;
 50 mSv; 100 mSv; 1 Sv
 dose rate 0.3 $\mu\text{Sv/h}$; 3 $\mu\text{Sv/h}$; 30 $\mu\text{Sv/h}$; 300 $\mu\text{Sv/h}$;
 3 mSv/h; 30 mSv/h; 300 mSv/h; 1 Sv/h
 customized thresholds

Response time to dose rate change

when $\dot{H}_p(10) > 10 \mu\text{Sv/h}$ $\dots\dots\dots 5 \text{ s}$

Radiation overload $\dots\dots\dots$ up to 10 Sv/h

Operating conditions:

operating temperature range $\dots\dots\dots -10^\circ +40^\circ \text{ } \dot{N}$
 relative humidity at
 temperature of $+35^\circ\text{C}$ $\dots\dots\dots$ up to 90 %
 stability to drop from 1.5 m height

Protection class $\dots\dots\dots$ IP54

Power requirements 2 cells type AAA (LR03) or
 accumulators

Continuous operation time from one cells' set
 when $\dot{H}_p(10) < 100 \mu\text{Sv/h}$ $\dots\dots$ not less than 500 h

Electromagnetic compatibility

EN 61000-4-2:1995
 EN 61000-4-3:2002

Dimensions $\dots\dots\dots$ 105×58×23 mm

Weight (without batteries) $\dots\dots\dots$ 100 g

Complete set: personal dosimeter, batteries, chain with a clamp, plastic boxes for easy decontamination, manual and package.

The reader and applied software are options and they are supplied **on additional order.**

All modifications of the personal dosimeter AT3509 have pattern approval certificates of Republic of Belarus, Russian Federation, Kazakhstan and Lithuania, and modifications AT3509, AT3509A have pattern approval certificate of Ukraine.

They comply with IEC 61526 International standard requirements. They also conform with the 89/33/EEC directive complying with EN 55022 B:1998 and EN 55024 B:1998 standard requirements.

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