AT2503B, AT2503B/1, AT2503B/2
Personal Dosimeters

CONTROL OF X-RAY AND GAMMA RADIATION PERSONAL DOSE EQUIVALENT





Pocket-size direct-reading intelligent instruments are an ideal combination of accuracy, functionality, usability, reliability and price.

The dosimeters are designed for measurement of Hp(10) personal dose equivalent and $\dot{H}p(10)$ personal dose equivalent rate of continuous X-ray and gamma radiation.

Operating principle

Geiger-Muller counter tube with energy compensating filter is used as a detector.

Intrinsic background metering and microprocessor processing provides high measurement accuracy.

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

Integrated non-volatile memory allows recording and saving in de-energised state all accumulated dose data and dose accumulation history.

The dosimeter, PC-connectible reader, and application software suite make an efficient automatic system for automated control and accounting of personnel radiation burden at sites where ionizing radiation is used.

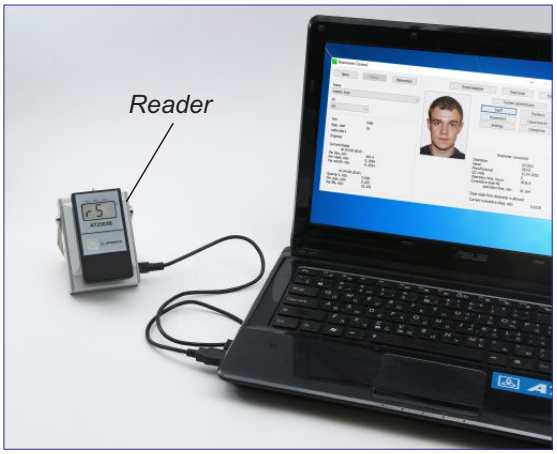
The system offers the following functions:
- Read manufacturer and individual numbers in the dosimeter
- Read the "dose log" data
- Reset (zero) the accumulated dose and "dose log" data
- Read the total operating time and the total dose accumulated by the dosimeter in the process of operation
- Dosimeter configuration:
  - Allow/deny threshold selection by a button
  - Modify individual dosimeter number
  - Adjust accumulation interval and alarm thresholds
  - Allow/deny resetting of accumulated dose by button

Application

- Radiation protective measures in case of nuclear disasters
- Nuclear industry
- Nuclear medicine
- Radiology
- Civil protection
- Civil aviation
- Research activities
- Dose monitoring of population

Features

- Simultaneous measurement of Hp(10) personal dose equivalent and $\dot{H}p(10)$ personal dose equivalent rate of continuous X-ray and gamma radiation
- Autocompensation of intrinsic detector background
- Resistance to impacts and vibration, dust-and-moisture-proof, tolerance to electromagnetic interference
- Constant detector self-check and battery level monitoring
- Sound and LED alarm
- Alarm mode for detection of pulse radiation with pulse duration over 10 ns (option)
- 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
- Average service life is not less than 15 years

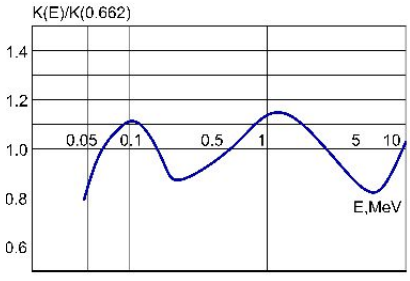


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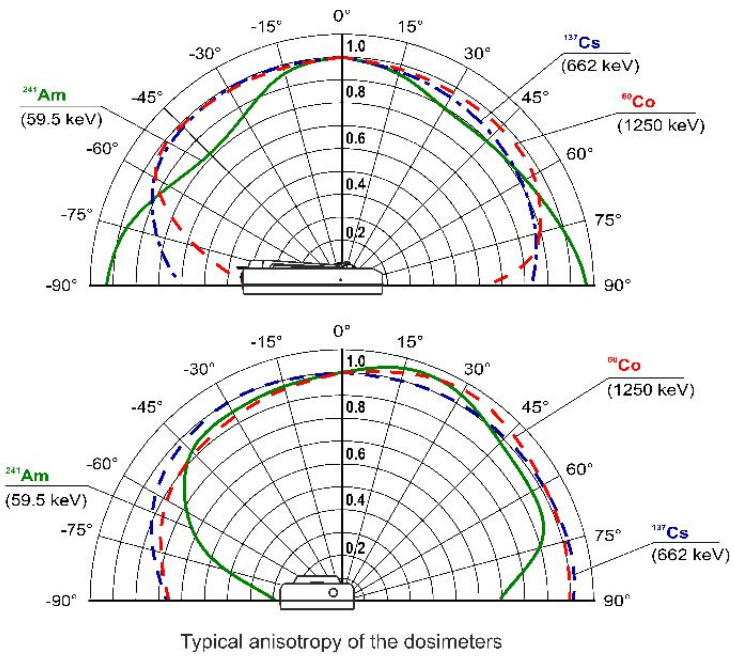
Specifications	AT2503B	AT2503B/1	AT2503B/2
Detector	Geiger-Muller counter tube		
Energy range	50 keV – 10 MeV		
Measurement range of individual dose equivalent	0.1 μSv – 10 Sv	0.1 μSv – 10 Sv	1 μSv – 10 Sv
Measurement range of individual dose rate equivalent	0.1 μSv/h – 1 Sv/h	0.1 μSv/h – 0.2 Sv/h	1 μSv/h – 10 Sv/h
The range of dose-dependent response variation limits (dose response) over the entire effective range of measurement	$\pm(15+U_{relD})$%, where U_{relD} is the relative expanded uncertainty of accepted dose value at the check point in %. Coefficient of variation v above $(16-H/H_0)$% for the dose $H<11H_0$ and not above 5% for the dose $H\geq11H_0$, where H_0 is the lower limit of dose measurement		
The range of dose rate-dependent response variation limits over the entire effective range of measurement	$\pm(15+U_{relDR})$%, where U_{relDR} is the relative expanded uncertainty of accepted dose rate value at the check point in %. Coefficient of variation v does not exceed: 20% for dose rates $\dot{H}<10$ μSv/h $(21-\dot{H}/10$ μSv/h)% for dose rate value of 10 μSv/h$\leq\dot{H}<60$ μSv/h 15% for dose rates $\dot{H}\geq60$ μSv/h		
The range of relative response variation limits depending on the energy of gamma radiation and the angle of incidence in the range 60°	from $-(29+U_{relDR})$% to $+(67+U_{relDR})$%, where U_{relDR} is the relative expanded uncertainty of the conventional value of a dose rate		
Calibration error for ^{137}Cs	±5%		
The time of response to 10-fold change of the dose rate within effective range of measurement	≤5 s (for dose rate value >1 mSv/h)		
Radiation overloading	≤10 Sv/h	≤2 Sv/h	≤20 Sv/h
Alarm thresholds	1 of 8 independent dose thresholds, 1 of 8 independent dose rate thresholds		
Power supply options	SR44 type batteries with nominal voltage 1.5V and minimum capacity 150 mA·h each		
Total run time on one set of batteries	≥1000 h (for $\dot{H}p(10)\leq10$ μSv/h)		
Protection class	IP54		
Drop protection	From ≤1.5 m to a hard surface		
Average operating life	≥15 years		
Connection to PC	USB 2.0 (in the Reader)		
Operation temperature range	-30°C to +60°C		
Relative air humidity	≤90% (Air temperature ≤35 °C without condensation)		
Dimensions	85x46x16 mm (w/o clip)		
Weight	70 g (w/o batteries)		

The personal dosimeters comply with: IEC 61526:2010 (confirmed by tests IAEA-EURADOS, IAEA-TECDOC-1564), GOST 27451-87
Safety requirements of IEC 61010-1:2010
EMC requirements of EN 55011:2009, IEC 61000-4-2:2008, IEC 61000-4-3:2008

Design and specifications are subject to change without notice



Typical energy dependence of dosimeters relative to energy 0.662 MeV gamma radiation ^{137}Cs



Typical anisotropy of the dosimeters

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