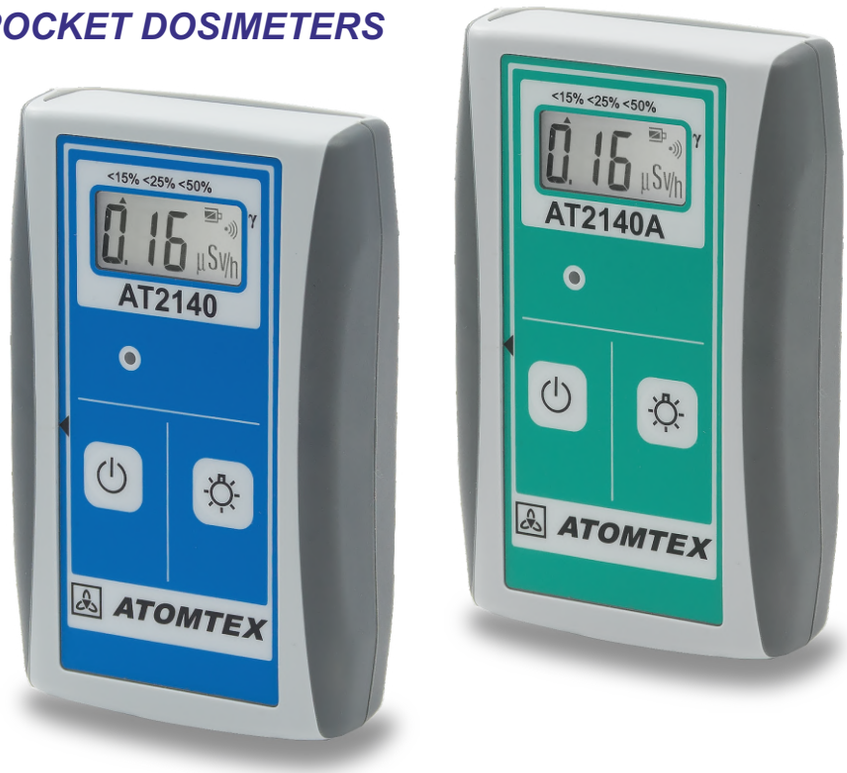
AT2140 Dosimeters

Versions:

AT2140, AT2140A, AT2140A/1

POCKET DOSIMETERS



Compact energy efficient instrument for measurement of ambient dose equivalent and ambient dose equivalent rate of continuous gamma radiation.

The dosimeter can be used by radiation control services or by untrained people concerned with radiation background level in their place of work, residence and recreation, as well as for educational purposes.

Operating principle

The operation principle is based on the count rate measurement of impulses generated by Geiger-Muller counter tube under the influence of radiation. Count rate is converted automatically into measurable physical values throughout the range.

Dosimeters allow selecting one of eight pre-set dose rate and dose threshold levels.

Energy compensating filter facilitates energy dependence correction of sensibility in entire energy range of gamma radiation.

Microprocessor-based unit is responsible for controlling the Dosimeter operating modes, calculations, storing and displaying measurement results and for self-checking function.

The AT2140A/1 version has a USB interface to exchange information with a PC, while "Dose Manager" application software provides the following functionality:

- 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

- Dosimetric monitoring in manufacturing facilities, health care and other institutions
- Radioecology
- Civil protection
- Fire-fighting service
- Educational institutions

Features

- Unique combination of efficiency, response and usability
- Hours of continuous operation on one set of batteries: 5000 hours (AT2140) and 10000 hours (AT2140A, AT2140A/1)
- USB interface and non-volatile memory options to create a system of automated control and accounting of personnel radiation burden (AT2140A/1)
- Indication of battery status and main units fault condition
- Autocompensation of intrinsic detector background
- Quick response to changes in radiation level
- User friendly and easy to operate
- Simultaneous dose rate and dose measuring
- Automatic calculation of measurement statistical error
- Sound and visual alarm in case threshold level is exceeded for dose and dose rate
- Night time and low light operation is possible
- Fit for work in hard temperature conditions (AT2140A, AT2140A/1)
- Average service life is not less than 15 years

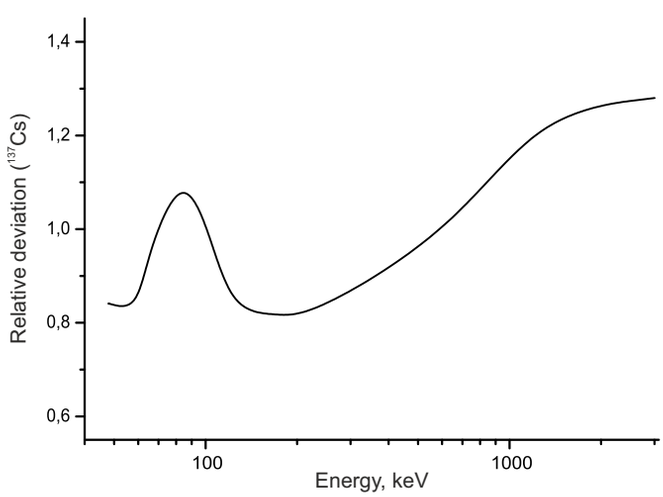
AT2140 Dosimeters

Dosimeter main parameters	AT2140	AT2140A	AT2140A/1
Indication range of ambient gamma radiation dose equivalent rate	0.01 μSv/h – 10 mSv/h	0.01 μSv/h – 100 mSv/h	
Measurement range of gamma radiation ambient dose equivalent rate	0.1 μSv/h – 10 mSv/h	0.1 μSv/h – 100 mSv/h	
Indication range of gamma radiation ambient dose equivalent	0.01 μSv – 9.99 Sv		
Measurement range of ambient gamma radiation dose equivalent	0.1 μSv – 1.99 Sv		
Limit of intrinsic relative measurement error	±15%		
Calibration error	±5% max		
Typical sensitivity to ^{137}Cs gamma radiation	1.8 cps/(μSv·h^{-1})		
Energy range	50 keV – 3 MeV		
Energy dependence relative to 662 keV (^{137}Cs)	±30%	±25%	
Anisotropy in angular spacing ±60° For ^{137}Cs и ^{60}Co For ^{241}Am	 ±25% ±60%		
Response time for dose rate change from 1 to 10 μSv/h	≤10 s	≤5 s	
Burn-up life	≥100 Sv		
Radiation overloading	The dosimeter withstands a 100-fold exceedance of the upper limit of dose rate measurement range with indication of readings not lower than the upper limit value		
Power supply options	2 x AA-size batteries or 2 x AA-size rechargeable cells with nominal voltage 1.2V		
Total operation time with one battery pack in natural radiation background	≥5000 h	≥10000 h	
PC interface	–	–	USB
Drop protection	–	From ≤1.0 m to hard surface	
Protection class	IP40		
Average operating life	≥15 years		
Operation temperature range	-20°C to +50°C	-30°C to +60°C	
Relative humidity with air temperature ≤35°C without condensation	≤95 %		
Overall dimensions, weight (w/o batteries)	111x70x28 mm, 110 g		

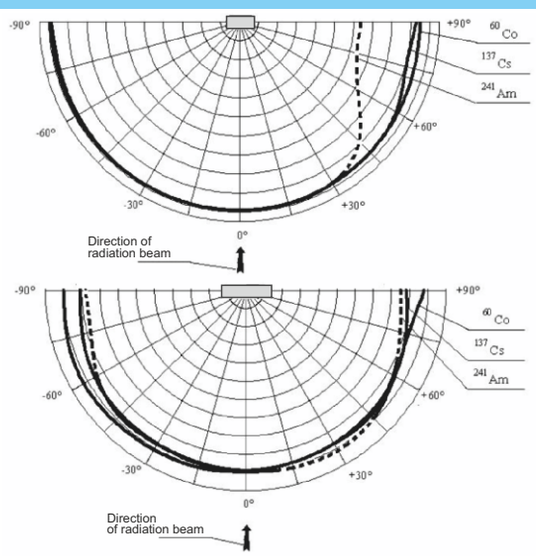
The dosimeters comply with: GOST 27451-87, IEC 60846-1:2009, Safety requirements of IEC 61010-1:2010, EMC requirements of EN 55011:2009, IEC 61000-4-2:2008, IEC 61000-4-3:2008

Design and specifications are subject to change without notice

Typical sensitivity variation of dosimeters



Typical energy dependence of the dosimeter relative to 662 keV (^{137}Cs)



Typical sensitivity variation of dosimeters with gamma radiation angle of incidence

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