

AT6130 Radiation Monitor

Pocket Radiation Monitor

Compact device intended for gamma and X-radiation ambient dose equivalent and ambient dose equivalent rate measurement, as well as for measurement of beta particle flux density on contaminated surfaces.

In search mode it measures count rate in counts per second.



Operating principle

Device operating principle is based on the process of count rate measurement of impulses, generated in Geiger-Muller counter tube under the influence of X, gamma and beta radiation.



When the filter cap opens the instrument switches to beta particle flux density measurement mode automatically.

Count rate is converted automatically into measurable physical values throughout the range. Energy compensating filter allows correcting energy dependence of sensitivity efficiently in entire energy range of photon radiation.

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

The Radiation monitor can be secured in a holder to facilitate evaluation of radioactive contamination.

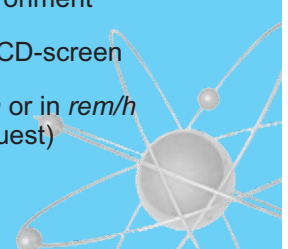


Applications

- Radiation protective measures in case of nuclear disasters
- Civil protection
- Radioecology
- Fire-fighting service
- Customs service
- Dosimetric monitoring in manufacturing facilities, health care and other institutions
- Identification of banknote, identity document, personal belongings, clothing, etc. contamination with radioactive substances

Features

- Low weight and small size
- Automatic compensation of intrinsic detector background
- Sound and visual alarm in case threshold level is exceeded for dose, dose rate and flux density
- Rapid reaction to statistically significant change of dose rate (measurement process restart)
- Selective measurement of beta and gamma radiation in mixed fields
- Field operation capability over a wide temperature range
- In search mode each registered gamma quantum (beta particle) is indicated by a sound signal
- Up to 2000 measurement results can be stored in non-volatile memory with information about measurement date and time
- Measurement results, current time, date and battery life indicator is displayed on matrix LCD screen
- Headphones can be attached when working in noisy environment
- Bright white backlit LCD-screen
- Display in either Sv/h or in rem/h (configurable per request)



ATOMTEX[®]
Instruments and Technologies for Nuclear
Measurements and Radiation Monitoring



Zievert

Ionizing radiations
detectors and
instruments

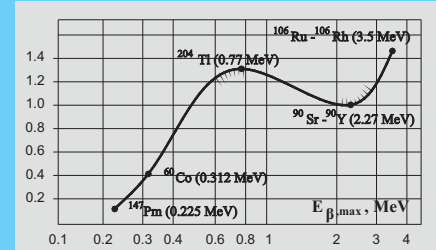
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Specification

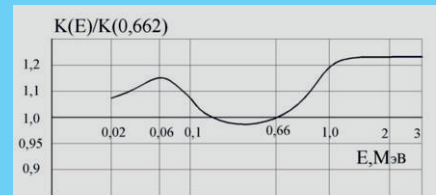
Ambient gamma and X radiation dose rate equivalent indication range *	0.01 $\mu\text{Sv/h}$ – 10 mSv/h or 1 $\mu\text{rem/h}$ – 1 rem/h
Ambient gamma and X radiation dose rate equivalent measurement range *	0.1 $\mu\text{Sv/h}$ – 10 mSv/h or 10 $\mu\text{rem/h}$ – 1 rem/h
Ambient gamma and X radiation dose equivalent indication range *	1 nSv – 100 mSv or 0.1 μrem – 10 rem
Ambient gamma and X radiation dose equivalent measurement range *	0.1 μSv – 100 mSv or 10 μrem – 10 rem
Beta particles measurement range: * - flux density - surface activity - count rate	10 – $1 \cdot 10^4$ $\text{particle} \cdot \text{min}^{-1} \cdot \text{cm}^{-2}$ 0.5 – 500 $\text{Bq} \cdot \text{cm}^{-2}$ 0.1 – $1 \cdot 10^4$ cps
Limits of tolerable intrinsic relative error of dose rate measurement in the range from 0.1 $\mu\text{Sv/h}$ to 10 mSv/h (from 10 $\mu\text{rem/h}$ to 1 rem/h)	$\pm 20\%$
X and gamma radiation energy range	20 keV – 3 MeV
Spectrum maximum energy range of registered beta particles	155 keV – 3.5 MeV
Energy dependence relative to 662 keV (^{137}Cs)	$\pm 30\%$
Typical sensitivity to ^{137}Cs gamma radiation to $^{90}\text{Sr} + ^{90}\text{Y}$ beta radiation	2.8 cps/ $(\mu\text{Sv} \cdot \text{h}^{-1})$ 0.05 cps/ $(\text{particles} \cdot \text{min}^{-1} \cdot \text{cm}^{-2})$
Response time for dose change from 1 to 10 $\mu\text{Sv/h}$	$\leq 7\text{s}$ (accuracy error $\leq \pm 10\%$)
Radiation overloading	Radiation monitor can withstand 100-fold rise of dose rate measurement and beta particles flux density upper range limit for 5 minutes with readings not lower than maximum
Burn-up life	≥ 100 Sv
Continuous run time	≥ 500 h
Working temperature range	-20°C to $+55^\circ\text{C}$
Relative humidity with air temperature $\leq 35^\circ\text{C}$ without condensation	$\leq 95\%$
Drop protection	From ≤ 1.5 m to hard surface
Protection class	IP57
Power supply	2 x AAA-size batteries (LR 03) or 2 x AAA-seize rechargeable cells with nominal voltage 1.2 V
Overall dimensions, weight	110x60x38 mm, 0.25 kg

* Units of measure are chosen during ordering procedure and cannot be altered later

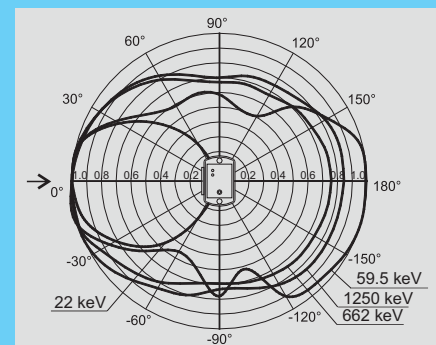
Design and specifications are subject to change without notice



Normal relationship between monitor sensitivity and maximum beta spectrum energy during beta radiation flux density measurement



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



Normal relationship between monitor sensitivity and gamma radiation incidence angle relating to the calibration direction

The radiation monitors comply with:
GOST 27451-87, GOST 28271-89, GOST 17225-85,
Safety requirements of IEC 61010-1:2010,
EMC requirements of EN 55011:2009,
IEC 61000-4-2:2008, IEC 61000-4-3:2008



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