AT1103M X-ray Radiation Dosimeter

Energy range from 5 keV to 160 keV



Applications

- Monitoring accepted levels of X-ray radiation with low-energy and intensity from video display units, night vision devices, oscillographs, TV receivers, microwave emitters, ion implanters, search and medical continuous X-ray apparatus
- Certification testing of instruments and equipment with sources of unused X-ray radiation, protective measures management
- Dosimetric control during work with ^{55}Fe, ^{239}Pu, ^{109}Cd, ^{125}I, ^{129}I, ^{241}Am, ^{57}Co, ^{139}Ce etc. isotopes

Features

- Search for X-ray and low-energy gamma radiation sources
- Quick accommodation to changes in radiation level
- Sound and visual alarm in case threshold level is exceeded
- Memory function for 100 measurement results
- Integrated system for measurement path LED stabilization, so there is no need for check radioactive source
- Analogue-to-digital converter foe 256 channels
- Measurement results can be written, stored and transmitted into PC using RS 232 interface
- Dust and splash-proof design
- Not for natural background measuring
- Background component correction during measuring

Unique highly-sensitive devise for measuring radiation exposure on crystalline lens, mucus membranes and skin.

Measures directed dose equivalent rate of continuous X-ray radiation with energy from 5 keV.

Operating principle

NaI(Tl) ø9x2 mm scintillator with beryllium window is used in the dosimeter as an X-ray detector.

Method of measuring directed dose equivalent rate is based on determining of instrument spectrum and its non-continuous weighing with normalization per dose rate unit, while the energy dependence is corrected.

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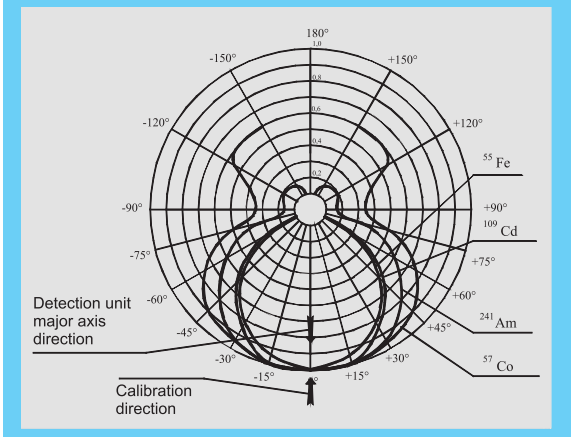
Specification

Scintillation detector	NaI(Tl) Ø9x2 mm with beryllium window
Directional radiation dose equivalent rate measurement range	50 nSv/h – 100 μSv/h
Directional radiation dose equivalent measurement range	50 nSv – 5 mSv
Limits of tolerable intrinsic relative error	±15%
Registered X-ray radiation energy range	5 – 160 keV
Typical sensitivity to ^{241}Am gamma radiation	400 cps/(μSv·h^{-1})
Response time for dose rate change from 1 to 10 μSv/h	≤2 s (accuracy error ≤±10%)
Energy dependence relative to ^{241}Am in the following range:	
5 keV ... 60 keV	±35%
60 keV ... 160 keV	±30%
Calibration error for ^{241}Am	±5% max.
Detectable ^{241}Am activity at 0.5 m distance for period <2 s	1000 kBq (27 μCi)
Maximum statistical load	6·10^4 s^{-1}
Burn-up life	≥100 Sv
Operation mode setup time	≤5 min
Power supply	Internal rechargeable Ni-MH battery or AC power adapter
Continuous run time	≥24 h
Working temperature range	0°C to +40°C
Relative air humidity with temperature ≤35°C without moisture condensation	≤90%
Protection class	IP54
Overall dimensions	233x85x67 mm
Weight	0.9 kg



Normal relationship between dosimeter sensitivity and radiation incidence angle

The X-ray radiation dosimeter complies with:
GOST 27451-87, GOST 28271-89,
Safety requirements of IEC 61010-1:2010,
EMC requirements of EN 55011:2009,
IEC 61000-4-2:2008, IEC 61000-4-4:2004,
IEC 61000-4-5:2005, IEC 61000-4-3:2008,
IEC 61000-4-6:2008, IEC 61000-4-11:2004

Design and specifications are subject to change without notice

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