

AT5350 AT5350/1

DOSIMETERS

Measurement error 3 %

Multipurpose high-accuracy wide-range x-ray and gamma radiation dosimeter to measure kerma and kerma rate in air

Features

- Calibration in kerma in air, absorbed dose in air, absorbed dose in water, exposure dose and equivalent dose unit
- Ionization chamber library in the non volatile memory
- Possibility to extend the library with additional ionization chambers
- Built-in high-voltage power supply for ionization chambers output voltage $\pm (1-500) V$, increment 1 V
- Automatic measurement result correction considering air density for nonhermetic ionization chambers by input temperature and pressure values
- Input of resultant correction factor specified by energy response, polarization and recombination effects etc.
- Automatic compensation of input displacement current
- Selection of measurement units (Gy, Sv, R, A, C) specified for measuring physical values
- Mathematical and logical processing of measurement results by 8 programs
- Keeping up to 500 measurement results, possibility to review, process and print them
- Matrix backlit LCD to readout measurement results and additional information
- RS 232 and IEEE-4888 interface and additional digital inputs/outputs
- Analog output



	IEEE 488.2	RS232C	Analog output
AT5350	+	+	+
AT5350/1	-	+	-

Application

- Beam therapy
- Clinical dosimetry
- Radiation protection
- Physical research
- Ionizing radiation metrology
- Short current and charge measuring



ATOMTEX

INSTRUMENTS AND TECHNOLOGIES FOR
NUCLEAR MEASUREMENTS AND RADIATION MONITORING

Specification

ELECTROMETRIC

Measuring range of continuous current (charge) of positive and negative polarity.....	$1 \cdot 10^{-14} - 1 \cdot 10^{-6}$ A ($1 \cdot 10^{-14} - 6 \cdot 10^{-2}$ C)
The limits of tolerated relative intrinsic error of current (charge) measurement.....	$\pm(0.5\% + 1 \text{ less significant digit})$
Increment of less significant digit within current (charge) measurement	$1 \cdot 10^{-15}$ A ($1 \cdot 10^{-14}$ C)
Zero level instability at the least range within continuous operation for 24h	$\leq \pm 5 \cdot 10^{-15}$ A
Spurious leakage current when the ionization chamber is not connected	$\leq \pm 1 \cdot 10^{-15}$ A
Zero level drift within charge measuring when the ionizing chamber is not connected	$\leq \pm 6 \cdot 10^{-14}$ C / min
Permanent instability	$\leq \pm 0.5$ % / year
Time interval of numerical current integration at charge measuring	1 - 99999 s

DOSIMETRIC

Kerma in air (kerma rate in air) measuring range

chamber TM32002 (spherical chamber $V=1000\text{cm}^3$)	50 nGy - 3 Gy (0.4 $\mu\text{Gy}/\text{min}$ - 3 mGy/min)
chamber TM23361 (cylindrical chamber $V=30\text{cm}^3$)	2 μGy - 2 kGy (12 $\mu\text{Gy}/\text{min}$ - 2 Gy/min)
chamber TM30001-10, (TM30010, TM30006, TM30013) (thimble chamber $V=0.6\text{cm}^3$)	100 μGy - 300 kGy (0.6 mGy/min - 300 Gy/min)
chamber TM31010 (waterproof thimble chamber $V=0.125\text{cm}^3$)	500 μGy - 1.5 MGy (3.0 mGy/min - 500 Gy/min)
chamber TM23342 (plane parallel low-energy X-ray chamber $V=0.02\text{cm}^3$)	3 mGy - 10 MGy (20 mGy/min - 10 kGy/min)

Relative intrinsic kerma (kerma rate) measurement error

at confidence probability of 0.95

± 3 %

Measuring photon radiation energy range

chambers, type TM32002, TM23361, TM30001-10, TM31010	0.03 - 1.33 MeV
chamber, type TM 23342	0.008 - 0.035 MeV

Dosimeter sensitivity response upon photon radiation energy

0.03 - 1.33 MeV (TM32002)	$\leq \pm 5$ %
0.1 - 1.33 MeV (TM30001-10, TM23361, TM31010)	$\leq \pm 4$ %
0.03 - 0.1 MeV (TM30001-10, TM23361, TM31010)	$\leq \pm 6$ %
0.008 - 0.035 MeV (TM23342)	$\leq \pm 5$ %

OPERATIONAL

Operating temperature range	0 - 40 °C
Relative humidity at $t=25$ °C	up to 80 %
Power requirements	(220 \pm 22) V, 50 Hz
Required power	≤ 12 VA
Measuring electrometric unit dimensions	260x98.5x250 mm
Measuring electrometric unit weight	4.5 kg
Electrometric cable length	up to 20 m

Complete set: electrometer with any set of ionization chambers: TM32002, TM23361, TM30001-10, TM30010, TM31010 and other PTW Freiburg (Germany) ionization chambers, PTW Freiburg electrometric cables 6, 10 and 20 m and packing case. It is possible to order only the electrometer. Support for ionization chamber fixation is an option and it is supplied **on additional order**.

The dosimeter AT5350 has pattern approval certificates of Republic of Belarus, Russia, Ukraine, Kazakhstan and Lithuania. It complies with IEC 60731 International standard requirements. They also conform with the 89/336/EEC directive complying with EN 61326-1+A1, EN 55011, EN 61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-11 standard requirements and 73/23/EEC directive complying with EN 61010-1+A2.

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