

# AT1320, AT1320A, AT1320B Gamma Activity Monitors



## Water, foods and other materials radioactive contamination monitoring

Highly sensitive scintillation gamma activity monitors of spectrometric type are designed for measuring volumetric (specific) activity of  $^{131}\text{I}$ ,  $^{134}\text{Cs}$ ,  $^{137}\text{Cs}$ ,  $^{40}\text{K}$ ,  $^{226}\text{Ra}$ ,  $^{232}\text{Th}$  radionuclides in samples.

Model	Controlled radionuclides	Measuring vessels
AT1320	$^{137}\text{Cs}$ , $^{40}\text{K}$ , $^{226}\text{Ra}$ , $^{232}\text{Th}$	1 l, 0.5 l, 0.1 l
AT1320A	$^{137}\text{Cs}$ , $^{40}\text{K}$	1 l, 0.5 l, 0.1 l
AT1320A (with extended radionuclide library)	$^{131}\text{I}$ , $^{134}\text{Cs}$ , $^{137}\text{Cs}$ , $^{40}\text{K}$	1 l, 0.5 l, 0.1 l
AT1320B	$^{137}\text{Cs}$ , $^{40}\text{K}$	1 l, 0.5 l, 0.1 l, 10 l (without protection unit lid)

### Operating principle

Operating principle is based on analysis of pulse-height distribution from detection unit.

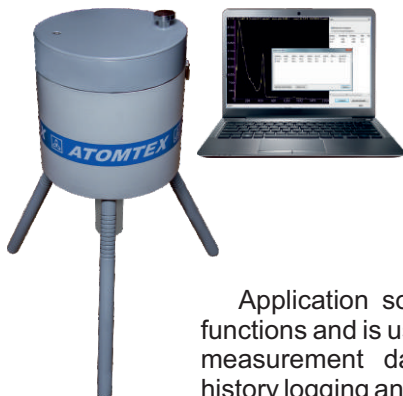
Energy distribution parameters are processed in energy windows according to matrix method.

Matrix method allows measurement of volumetric (specific) activity for monitored radionuclides based on energy windows count rate.

Measurement results are displayed on Information processing unit (PU) screen in real time.

Detection units of gamma activity monitors can be connected to PC.

Application software replaces Information processing unit functions and is used for controlling radioactivity monitor modes, measurement data display, spectra processing, electronic history logging and recording of measurement results.



### Applications

- Radiation protective measures in case of nuclear disasters
- Potable water monitoring
- Foodstuffs monitoring
- Agricultural products monitoring
- Mineral raw materials, construction materials, wood products monitoring
- Product, raw material and waste monitoring in mining and oil industry
- Radioactive waste and effluent monitoring in nuclear industry

### Features

- Smart spectrometric probe
- Internal continuous automatic LED stabilisation of gamma counter energy scale, calibration integrity monitoring and automatic calibration with integrated KCl sample
- Memory function and automatic background subtraction
- "Energy Windows" algorithm is used for instrument spectrum processing
- Recording and storing in memory up to 300 measured spectra
- 20-second radiation control of mushrooms and berries in 10-litre packing box
- PC with dedicated software can be used instead of data processing unit to provide documentation function
- Methodological and metrological support of measurements



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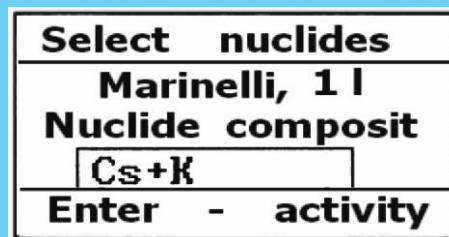
## Specification

<b>Detector</b>	Scintillation NaI(Tl), Ø63x63 mm
<b>Volumetric (specific) activity measuring range</b>	
<sup>137</sup> Cs	3.7 – 1·10 <sup>6</sup> Bq/l (Bq/kg)
<sup>134</sup> Cs	3 – 1·10 <sup>5</sup> Bq/l (Bq/kg)
<sup>131</sup> I	3 – 4·10 <sup>5</sup> Bq/l (Bq/kg)
<sup>40</sup> K	50 – 2·10 <sup>4</sup> Bq/l (Bq/kg)
<sup>226</sup> Ra	10 – 1·10 <sup>4</sup> Bq/l (Bq/kg)
<sup>232</sup> Th	10 – 1·10 <sup>4</sup> Bq/l (Bq/kg)
<b>Limits of tolerable intrinsic relative error</b>	±20%
<b>Measured sample density range</b>	0.1 – 3 g/cm <sup>3</sup>
<b>Minimum measured volumetric activity of <sup>137</sup>Cs radionuclide in potable water for Marinelli beaker geometry during 1-hour measurement with ±50% statistical error (P=0.95)</b>	5.7 Bq/l
<b>Energy range</b>	50 keV – 3 MeV
<b>Number of ADC channels</b>	512
<b>Integral nonlinearity</b>	±1% max.
<b>Intrinsic background for <sup>137</sup>Cs window</b>	<2 cps
<b>Typical resolution at 662 keV (<sup>137</sup>Cs)</b>	8.5%
<b>Operation mode setup time</b>	10 min
<b>Continuous operation time</b>	≥24 h
<b>Measurement instability during continuous service</b>	±3% max.
<b>Operation temperature range</b>	0°C to +40°C
<b>Relative air humidity with air temperature ≤30°C without condensation</b>	≤75%
<b>Power supply</b>	110-230 VAC, 50-60 Hz
<b>Power consumption</b>	≤8 VA
<b>Measurement vessels</b>	
Marinelli beaker	1 litre
Flat vessel	0.5 litre and 0.1 litre
Plastic box, 380x280x100 mm	10 litre
<b>Overall dimensions, weight</b>	
Detection unit	ø97x350 mm, 2 kg
Processing unit	200x106x35 mm, 0.62 kg
Protection unit	ø600x700 mm, 125 kg
Mains adapter	92x62x52 mm, 1 kg

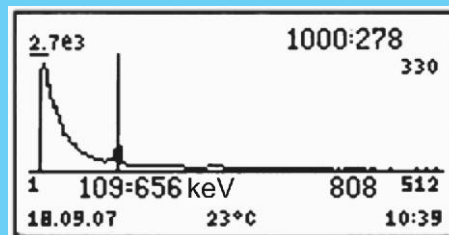
Design and specifications are subject to change without notice

## Capabilities

Select radionuclides to be detected



Display operational background spectrum



Determination of selected radionuclide activity

Nuc	Bq/kg
Cs	293.0±58.60
K	1966±393.2
Ra	134.1±29.59
Th	118.5±25.33

The gamma activity monitors comply with: GOST 27451-87, GOST 17209-89, GOST 23923-89, Safety requirements of IEC 61010-1:2010, EMC requirements of EN 55011:2009, IEC 61000-3-2:2005, IEC 61000-3-3:2008, EN 55011:2009, IEC 61000-4-2:2008, IEC 61000-4-3:2008, IEC 61000-4-4:2004, IEC 61000-4-5:2005, IEC 61000-4-6:2008, IEC 61000-4-8:2009, IEC 61000-4-11:2004



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