# 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 $^{131}$I, $^{134}$Cs, $^{137}$Cs, $^{40}$K, $^{226}$Ra, $^{232}$Th radionuclides in samples.

## 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

| *Model* | *Controlled radionuclides* | *Measuring vessels* |
|---|---|---|
| **AT1320** | $^{137}$Cs, $^{40}$K, $^{226}$Ra, $^{232}$Th | 1 l, 0.5 l, 0.1 l |
| **AT1320A** | $^{137}$Cs, $^{40}$K | 1 l, 0.5 l, 0.1 l |
| **AT1320A** (with extended radionuclide library) | $^{131}$I, $^{134}$Cs, $^{137}$Cs, $^{40}$K | 1 l, 0.5 l, 0.1 l |
| **AT1320B** | $^{137}$Cs, $^{40}$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.

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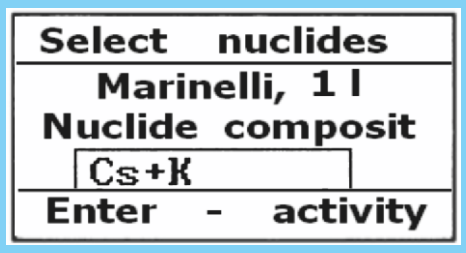
## Specification

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

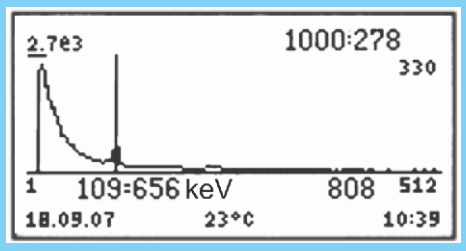
Design and specifications are subject to change without notice

## Capabilities

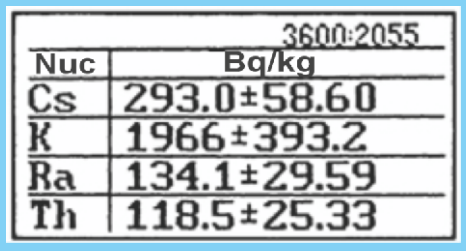
Select radionuclides to be detected




Display operational background spectrum




Determination of selected radionuclide activity




Gamma Activity Monitors meet Safety standard requirements:
IEC 61010-1:1990

EMC requirements:
EN 55011:2009
IEC 61000-3-2:2005
IEC 61000-3-3:2008
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 61000-4-11:2004

Gamma Activity Monitors have the pattern approval certificates of Republic of Belarus, Russian Federation, Ukraine, Kazakhstan and Turkmenistan.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