

AT1320C Gamma Activity Monitor



Water, foods and other materials radioactive contamination monitoring

Applications

- Radiation protective measures in case of nuclear disasters
- Radiation monitoring during decontamination operations
- Potable water monitoring
- Foodstuffs monitoring
- Agricultural products monitoring
- Mineral raw materials, soils, 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

- Spectrometric smart probe
- Internal continuous automatic LED stabilisation of gamma counter energy scale, calibration integrity monitoring and automatic calibration with integrated KCl sample
- Automatic radionuclide identification
- Automatic background subtraction
- Sample activity measurement for materials with wide density range
- Can be used both in stationary and mobile radiation monitoring laboratories
- Methodological and metrological support of measurements
- Measurement result log

Highly sensitive selective wide-range spectrometric scintillation gamma activity monitor is intended for measuring volumetric (specific) radionuclide activity in ^{131}I , ^{134}Cs , ^{137}Cs , ^{40}K , ^{226}Ra , ^{232}Th samples with 1 litre Marinelli beaker and 0.5 litre and 1 litre flat containers.

Operating principle

Gamma activity monitor operating principle is based on the detection unit pulse-height distribution analysis. Controlling PC reads the detection unit data on-line, processes it and displays on computer screen.

The installed PC application software is intended for controlling the activity monitor operation modes, viewing the recorded information, calculating gamma-radionuclide activity and measurement error for chosen measurement geometry, and managing electronic history log of measurement results.

Measurement procedure includes preliminary analysis of sample radionuclide composition. Activity calculation is carried out based on the results of monitored sample radionuclide identification procedure.



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INSTRUMENTS AND TECHNOLOGIES FOR NUCLEAR MEASUREMENTS AND RADIATION MONITORING

AT1320C Gamma Activity Monitor

Specification

Detector	Scintillation NaI(Tl) ø63x63 mm
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Measurement range for volume (specific) activity

Measurement geometry - Marinelli beaker 1l

¹³¹ I	3...4·10 ⁵ Bq/l (Bq/kg)
¹³⁴ Cs	3...1·10 ⁵ Bq/l (Bq/kg)
¹³⁷ Cs	3.7...1·10 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)

Measurement geometry - Marinelli beaker 0.5l

(measurements are done in 1l Marinelli beaker with a sample of 0.5l volume)

¹³⁴ Cs	5...1·10 ⁵ Bq/l (Bq/kg)
¹³⁷ Cs	5...1·10 ⁵ Bq/l (Bq/kg)
⁴⁰ K	70...2·10 ⁴ Bq/l (Bq/kg)

Measurement geometry - Flat-type container 0.5l

¹³¹ I	20...4·10 ⁵ Bq/l (Bq/kg)
¹³⁴ Cs	20...4·10 ⁵ Bq/l (Bq/kg)
¹³⁷ Cs	20...4·10 ⁵ Bq/l (Bq/kg)
⁴⁰ K	200...2·10 ⁴ Bq/l (Bq/kg)

Measurement geometry - "Denta" container 0.1l

¹³¹ I	50...1·10 ⁶ Bq/l (Bq/kg)
¹³⁴ Cs	50...1·10 ⁶ Bq/l (Bq/kg)
¹³⁷ Cs	50...1·10 ⁶ Bq/l (Bq/kg)
⁴⁰ K	500...2·10 ⁴ Bq/l (Bq/kg)

Intrinsic relative error of volume (specific) activity measurement	±20% max.
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Typical resolution at 662 keV (¹³⁷Cs)	8%
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Measured sample density range	0.1...3 g/sm ³
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Minimum measured activity for 1-hour measurement with statistical error ±50% (P=0.95), max.

Measurement geometry - Marinelli beaker, 1l

¹³¹ I	4 Bq/l (Bq/kg)
¹³⁴ Cs	4 Bq/l (Bq/kg)
¹³⁷ Cs	5.7 Bq/l (Bq/kg)
⁴⁰ K	78 Bq/l (Bq/kg)
²²⁶ Ra	12 Bq/l (Bq/kg)
²³² Th	10.4 Bq/l (Bq/kg)

Measurement geometry - Marinelli beaker 0.5l

¹³⁴ Cs	8 Bq/l (Bq/kg)
¹³⁷ Cs	8 Bq/l (Bq/kg)
⁴⁰ K	110 Bq/l (Bq/kg)

Measurement geometry - Flat-type container, 0.5l

¹³¹ I	20 Bq/l (Bq/kg)
¹³⁴ Cs	20 Bq/l (Bq/kg)
¹³⁷ Cs	20 Bq/l (Bq/kg)
⁴⁰ K	260 Bq/l (Bq/kg)

Measurement geometry - "Denta" container, 0.1l

¹³¹ I	50 Bq/l (Bq/kg)
¹³⁴ Cs	50 Bq/l (Bq/kg)
¹³⁷ Cs	52 Bq/l (Bq/kg)
⁴⁰ K	690 Bq/l (Bq/kg)

Energy range	50 keV...3 MeV
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Design and specifications are subject to change without notice

Number of ADC channels	1024
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Integral nonlinearity	±1% max.
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Intrinsic background for ¹³⁷Cs window	<2 cps
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Operation mode setup time	10 min
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Continuous run time	≥24 h
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Measurement instability during continuous service	≤3%
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Operating temperature range	0°C...+40°C
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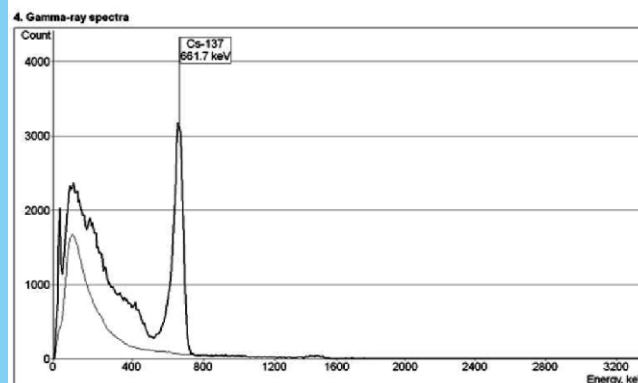
Relative humidity with air temperature ≤30°C without condensation	≤75%
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Overall dimensions, weight (without PC)	
Detection unit	ø97x350 mm, 2 kg
Protection unit	ø600x700 mm, 125 kg
USB-DU adapter	95x51x33 mm, 0.07 kg

Measurement result display

1. Sample information					
Measurement date	2012-02-20 14:54:07				
Geometry	Marinelli, 1l				
Exposure time, s	180				
Weight, g	968				
2. Equipment information					
Instrument	Nal(Tl) 63x63mm				
Number of ADC channels	512				
3. Measurement result					
Radionuclide	Activity	Abs. error	Stat. error	MDA	Dimension
Cs-137	7070	±1410	1.1%	37.3	Bq/kg
K-40	Not detected			417	Bq/kg

Measure values and its error calculated for confidence level P=0.95



AT1320C Gamma Activity Monitor meets Safety standard requirements: IEC 61010-1:1990
EMC requirements: EN 55011:2009, IEC 61000-4-2:2008, IEC 61000-4-3:2008.

AT1320C Gamma Activity Monitors has the pattern approval certificates of Republic of Belarus, Russian Federation, Kazakhstan



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