

# **GBS - 3131**

## **Gamma Beta Spectrometer**



EPCC / PRODUCTS / APPLICATION / SOFTWARE / ACCESSORIES / CONSUMABLES / SERVICES

**Analytical Technologies Limited**

An ISO 9001 Certified Company

## ►► Application

- Spectrometric and radiometric monitoring of radionuclide content in water, foods, agricultural raw materials, industrial, construction and forestry materials, environmental objects (soil, vegetation, etc.), metallurgical industry produce and products of other industries.
- Measuring of  $^{137}\text{Cs}$ ,  $^{134}\text{Cs}$ ,  $^{131}\text{I}$ ,  $^{90}\text{Sr}$ ,  $^{40}\text{K}$ ,  $^{226}\text{Ra}$ ,  $^{232}\text{Th}$  radionuclides activity
- Two channel scintillation gamma and beta spectrometer is designed for simultaneous and selective detection of the following:
  - $^{37}\text{Cs}$ ,  $^{134}\text{Cs}$ ,  $^{131}\text{I}$  and  $^{90}\text{Sr}$ , radionuclide specific activity in natural samples
  - Specific effective activity of  $^{40}\text{K}$ ,  $^{226}\text{Ra}$ ,  $^{232}\text{Th}$  in construction materials
  - Can be used for rapid radioactive purity determination of standardized sample heat of metal.

## ►► Operation

Gamma and beta spectrometer operation principle is based on measurement and transformation of gamma and beta radiation, detected by standalone detection units, into amplitude distributions, which are further transformed into digital code and saved in the detection unit memory.

## ►► Features

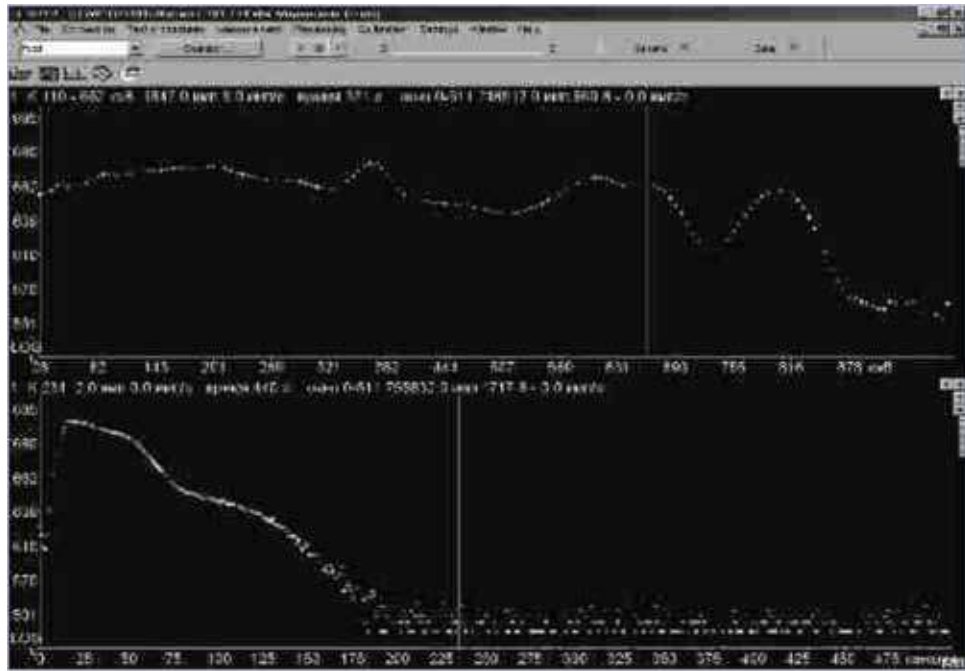
- 1024-channel analogue-to-digital converter is integrated into smart probes
- Continuous automatic LED stabilisation of spectrometric path in measurement mode
- Calibration integrity monitoring by means of integrated radioisotope check sample with less than the minimum significant activity
- Computer spectra processing with maximum likelihood method
- Automatic recording of sample density
- Spectra metering with on-line visualisation
- Simultaneous spectra metering and processing
- Methodological support of measurements

## ►► Specification

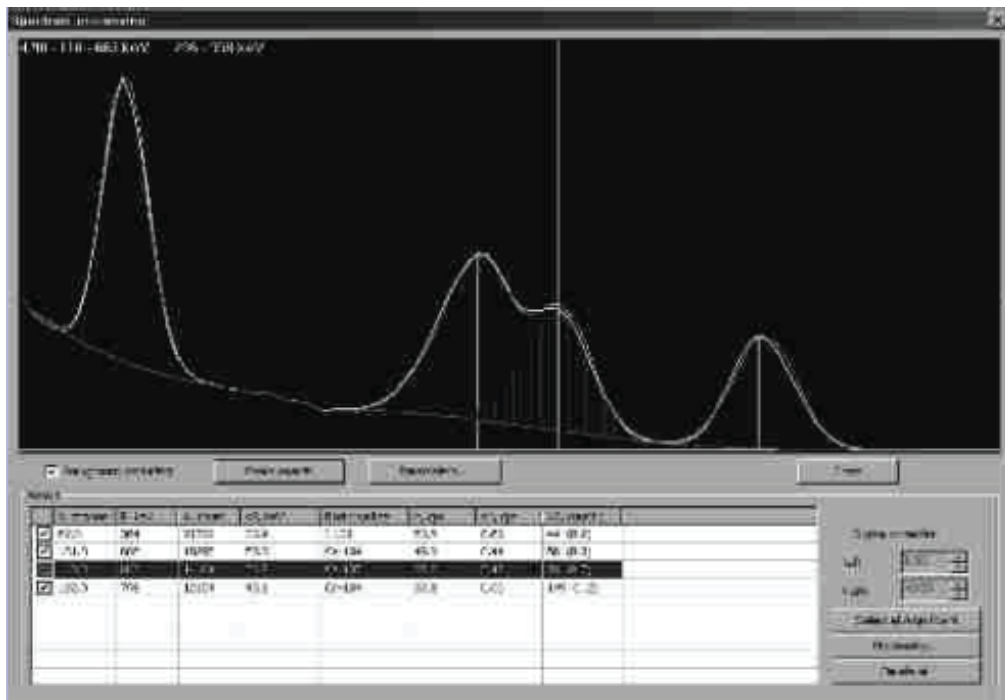
Detectors	
Gamma channel	Nal(Tl) ø63x63 mm
Beta channel	Plastic scintillator, ø128x9 mm
Energy range	
Gamma radiation	50 keV...3000 keV
Beta radiation	150 keV...3500 keV
Integral nonlinearity	<1%
Relative energy resolution	<7.5%
For 662 keV gamma-ray line	
Maximum input statistical load	$1 \cdot 10^4 \text{S}^{-1}$
Calibration scale instability	<2%
During continuous service	
Measurement instability	<5%
During continuous service	
Number of ADC channels	1024
Volumetric (specific) activity measuring range	10 Bq/l... $10^5$ Bq/l (Bq/kg)
Without sample connection	6 Bq/l... $10^5$ Bq/l (Bq/kg)
$^{131}\text{I}$ , $^{137}\text{Cs}$ , $^{134}\text{Cs}$ , $^{90}\text{Sr}$ , $^{40}\text{K}$ , $^{226}\text{Ra}$ , $^{232}\text{Th}$	2 Bq/l... $10^6$ Bq/l (Bq/kg)
	20 Bq/l... $10^6$ Bq/l (Bq/kg)
	20 Bq/l... $210^4$ Bq/l (Bq/kg)
	3 Bq/l... $10^4$ Bq/l (Bq/kg)
	3 Bq/l... $10^4$ Bq/l (Bq/kg)
Intrinsic relative error of activity measurement with P 0.95	±20% max.
Lower limit of $^{90}\text{Sr}$ measurement range with sample concentration in conversion to "wet" sample	
For potable water	0.2Bq/l
For milk, baby food	1.5Bq/l
For potatoes, corn, grain, agricultural raw materials	2.0Bq/kg
Measured sample density range	0.2 g/cm <sup>3</sup> ... 1.6 g/cm <sup>3</sup>
Continuous run time	≥24 h
Operation mode setup time	<15 min
Working temperature range	+10°C...+35°C
Relative humidity	≤75%
Power Supply	230 VAC (±23 V), 50 ± 0.4 Hz
Power consumption	300 VA max. without printer
Overall dimensions, weight	
Gamma detection unit	ø98x371 mm, 3 kg
Beta detection unit	ø138x340 mm, 3 kg
Protection unit	ø600x950 mm, 120 kg
Measurement vessels volume	Marinelli beaker, 1 litre;
For "wet" samples	Flat vessel, 0.5 and 0.1 litre
For concentrated samples	Flat vessel, 0.2 litre and 0.03 litre

## ►► Capabilities

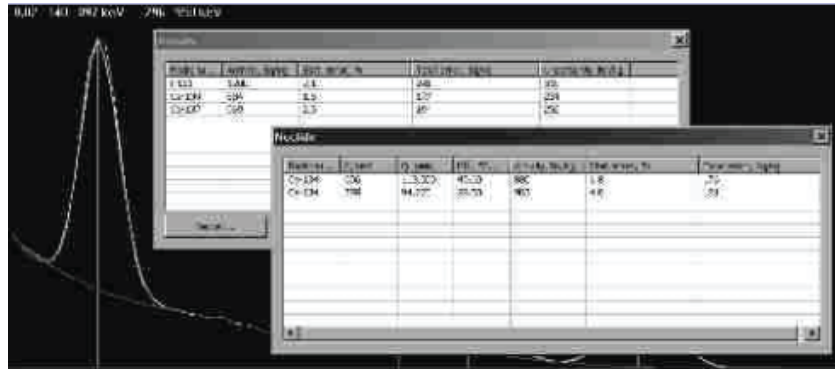
Data display in the form of gamma and beta instrument spectra



Gamma-emitting nuclide identification



## Calculation of identified radionuclide activity



## GBS 3131 Gamma beta spectrometer meets

International standard requirements:

IEC 61562:2001

IEC 61563:2001

EN 50371 :2002

Safety standard requirements:

IEC 61010-1:1990

EMC requirements:

EN 55022: 1998+A1

EN 55024: 1998+A1 :2001 +A2:2003

IEC 61000-4-2:2001

IEC 61000-4-3:2008

IEC 61000-4-4:2004

IEC 61000-4-5:2005

IEC 61000-4-11:2004

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**HPLC Servicing** :HPLC Servicing : We have team of service engineers who can attend to any make of HPLC promptly @the most affordable cost.

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## Regulatory compliances



## Corporate Social Responsibility

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3. ANALYTICAL FOUNDATION aims to DETOXYFY human minds,souls and body by means of yoga, Meditation, Ayurveda, Health Care, Awards, Media, Events, Camps etc.



 **Analytical**®  
Technologies Limited

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**Corporate & Regd. Office:**  
Analytical House, # E67 & E68,  
Ravi Park, Vasna Road, Baroda,  
Gujarat 390 015. INDIA

T: +91 265 2253620  
+91 265 2252839  
+91 265 2252370  
F: +91 265 2254395

E: [info@hplctechnologies.com](mailto:info@hplctechnologies.com)  
[info@multiplelabs.com](mailto:info@multiplelabs.com)  
[info@analyticalgroup.net](mailto:info@analyticalgroup.net)

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