



## Alpha Spectrometer Amber

### Features

Alpha Spectrometer is intended for the amplification, analogue filtration of the electric pulses coming from alpha radiation detectors. The complete spectrometer consists of vacuum chamber from stainless steel, power supply, preamplifier, pulse generator, discriminator, counter. Vacuum chamber allows to put in the majority types of detectors, including Ion Implanted Silicon Alpha Particle Detectors SIID with high resolution and up to 1200 mm<sup>2</sup> square. Sample holder inside vacuum chamber allows to adjust the distance between sample and the detector from 4 to 48 mm with 4 mm step.

- Device management with external PC software
- Vacuum gauge with pressure display and control via software
- Detector current meter from 1 nA to 10  $\mu$ A
- High Voltage inhibit in case of vacuum breaking
- Reverse bias on the sample holder
- Integrated Multichannel Analyzer
- Calibration pulser
- Vacuum chamber from stainless steel
- Fits up to 50 mm (2 inches) diameter samples
- Possibility to use alpha detectors up to 1200 mm<sup>2</sup>
- Adjustable sample-detector distance from 4 to 48 mm (with 4 mm step)

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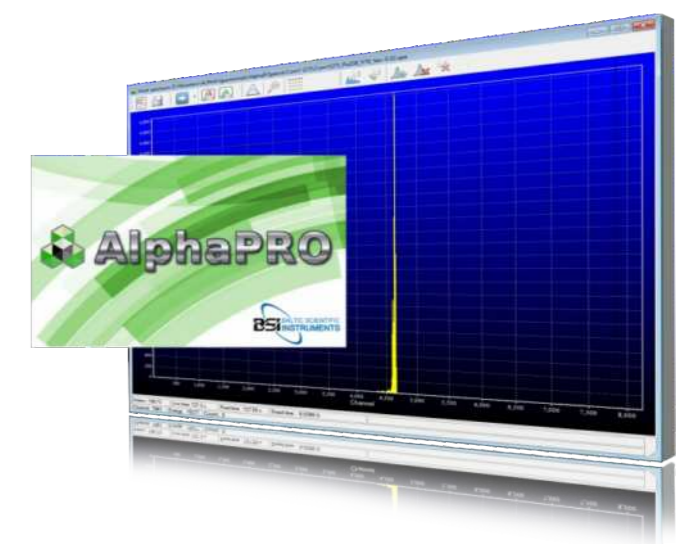
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## Specification

Parameter	Value
Registration energy range, keV	up to 10000
Shaping time constants, $\mu$ s	1
Integral nonlinearity, %	< 0.04
Maximum value of High Voltage, V	+150
Operation temperature range, $^{\circ}$ C	+5...+35
Temperature instability, %/C	< 0.01
Time of continuous operation, hour	> 24
Consumed power, Wt	< 10
Supply voltage, V	+/-12 +/-24
Energy resolution at 5.49 MeV for 450 mm <sup>2</sup> detector, keV	< 20
Absolute detection efficiency, %	> 20

Analytical software package AlphaPRO allows to:

- Execute spectra acquisition for the set time,
- Mark and select regions of interest and examine them on a separate plane,
- Increasing or reducing scale on horizontal and vertical axes,
- Perform energy calibration of spectra on two known energies;
- Determine centroids and area of peaks with background deduction and without background deduction;
- Make an estimation of energy resolution at one second and one tenth height of full absorption peak;
- Carry out an automatic serial spectra acquisition with automatic record on a disk;
- Print out spectrum window;
- Compare different spectra in one window simultaneously reducing or decreasing scale;
- Calculation of activities of alpha emitting radionuclides.



$\alpha$



## Silicon Ion Implanted Alpha Particle Detectors SIID

### Application

Ion Implanted Silicon Alpha Particle Detectors is a product for the precise alpha spectroscopy. The thin entrance window of the detector provides good energy resolution even in close location of the alpha radioactive source and also provides high efficiency registration of alpha particles.

### Features

- The detectors can operate without hermetization due to location of P-N junction inside of the detector crystal
- Contacts are formed using ion-implantation method and provide thin, well-formed junction
- Relatively thin dead layer (less than 500 Å)
- High solidity entrance window
- Possibility to work in vacuum
- Possibility of annealing the detectors up to 100 °C
- The detectors may be equipped with BNC or MICRODOT connectors adapted for different customer needs.
- The detectors are manufactured with open window as well as with metalized window.

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## Specification

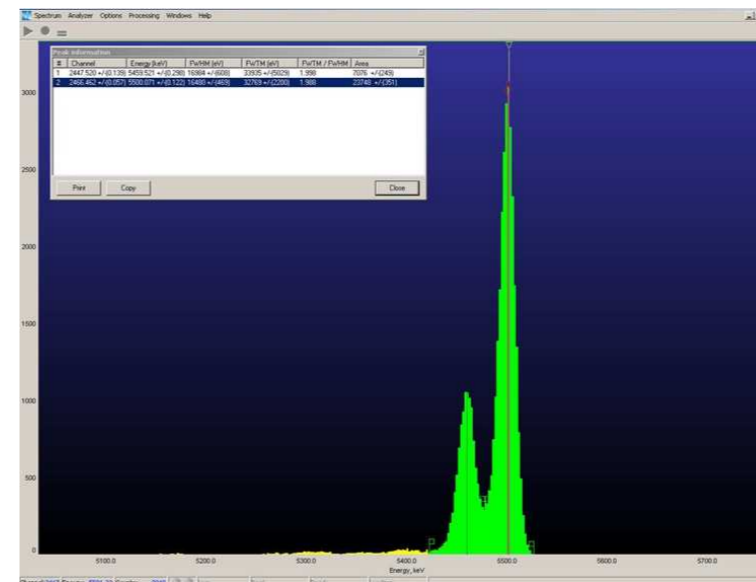
Detector area, mm <sup>2</sup>	Energy resolution*, keV		Detector type	Thickness, μm	Detector bias voltage, V
	Alpha	Beta			
50	12	6	Open	300 +/- 30	50 - 70
100	14	8	Open	300 +/- 30	50 - 70
300	16	14	Open	300 +/- 30	50 - 70
450	20	15	Open	400 +/- 30	50 - 70
450	25	17	Metalized	400 +/- 30	50 - 70
600	25	23	Open	400 +/- 30	50 - 70
600	30	20	Metalized	400 +/- 30	24 - 48
900	25	20	Open	400 +/- 30	50 - 70
1200**	35	30	Open	400 +/- 30	50 - 70

\* Shaping time – 1 μs.

\*\*The detectors of other sizes are available.

The Ion Implanted Silicon Alpha Particle Detectors with metalized coating of entrance window can be used as a part of radioactive aerosol monitors. This is special version of the detectors having following features:

- Allows the detector operation in ambient light
- The metal coating provides mechanical and chemical protection. The thickness of entrance window is less than 2 μm
- Opportunity of operation at bias voltage - from +15 to +24 V.



<sup>238</sup>Pu spectrum

