Model PAS-01- 4 Four Chamber Alpha Spectrometer System

(Multi Chamber Alpha Spectrometer System)

Model PAS-01-4, Multi Chamber Alpha Spectrometer System is a versatile indigenously developed four channel Alpha Spectrometer System for simultaneous measuring of four low activity samples that decay by Alpha-particle emission. Model PAS-01-4 is an integrated four spectrometers of 3 width standard NIM modules. Each module includes Vacuum Chamber, built in digital vacuum gauge, Passivated Ion-Implanted Silicon Detector (active area 450 mm2), Charge Sensitive Preamplifier, Spectroscopy Amplifier, Detector Bias Supply and 2048 channel MCA with Ethernet interface to standard PC or laptop.

Model PAS-01-4, Multi Chamber Alpha Spectrometer System is supplied with Four Alpha Spectrometer Modules, Mains operated 12 width NIM BIN with low ripple Power Supply, 150 LPM Vacuum Pump, 4 way vacuum manifold, 8 way Ethernet Switch to connect four Alpha Spectrometer Modules to communicate with standard PC / Laptop via Ethernet. The Control (PUMP, HOLD, and VENT) provided on front panel of Alpha Spectrometer module makes it easy to insert, analyze and remove samples.

Multichannel Alpha Spectrometer software package is provided to set/display various operating parameters of each Alpha Spectrometer Modules and for Data Acquisition/processing/display, Energy Calibration, ROI selection, Area Calculation, peak information, FWHM calculations, data Storage and report generation, etc. along with the system. Once operating parameters have been set, the data acquisition can continue off-line. Alpha Spectrometer is also available as Single Chamber system.

Single Chamber Alpha Spectrometer

Specifications

Typical Specifications of PAS-01-4

Number of Chambers	:	4 Chambers for simultaneous acquisition of Alpha Spectrum Expandable to 8 chambers
Energy Range	:	3 to 10 MeV with resolution of 5 keV per channel
PC/Laptop Interface	:	via 8 Port Ethernet Switch module to Ethernet Communication Port of PC/Laptop with TCP/IP protocol
Operating Parameter Control	:	Software Programmable HV, Gain, LLD, ULD by PC/Laptop
Vacuum Connection	:	4 way Vacuum Manifold connected to Vacuum Pump
Chamber Vacuum	:	Digital Display < 1 mTorr to > 100 Torr on the module LCD and on PC /Laptop Screen
Electrical	:	230 V, 50 Hz AC Mains Operation

Typical Specifications of Alpha Spectrometer Module PAS-01

Vacuum Chamber

Construction	**:**	Solid Brass with Nickel plating for ease of decontamination High-performance O-ring seal
Internal Dimensions	:	61mm wide x 74 mm deep x 40 mm high
Sample Trays	:	Solid Brass with Nickel plated Slide-in sample trays to accommodate samples of 13 mm to 51 mm dia.
Sample Spacing	:	From 4 mm (min) to 40 mm (max) in steps of 4mm
Control	:	Three-position PUMP, HOLD, VENT

Vacuum Sensor

Type	**:**	Precision MEMS based sensor to measure vacuum inside individual vacuum chamber
Range	**:**	< 1 mTorr to > 100 Torr
Display	:	Digital display by System Software panel

Detector

Type	:	Passivated Ion-implanted Planar Silicon Detector
Active Area	:	450 mm^2 (standard) or 300 mm^2 (user specified)
Resolution	:	20 keV in Vacuum for 5.5 MeV energy
System Resolution	:	better than 25 keV for Am^{241}
System Background	:	less than 1 CPH for above 3 MeV energy range
Detector Efficiency	:	@ 25 % for a detector source spacing of < 5 mm for Am^{241}
Operating Voltage	:	+ 40 to +60 Volts

Specifications

Low Noise Charge Sensitive Preamplifier

Output	:	+100 mV for 5.15 MeV
Rise Time	:	< 100 nSec
Fall Time	:	100 uS

Spectroscopy Amplifier

Input	:	0 to +200 mV
Output	:	0 to +5 Volts internally fed to ADC
Shaping	:	1 uS, Near Gaussian shape
Gain	:	System software programmable in 256 steps

High Voltage

Output	:	0 to +100 V System software programmable in 256 steps
HV ON/OFF	:	System Software settable
Ramp-up Time	:	50 volts per minute

Wilkinson ADC

Type	:	11 Bit Wilkinson @ 100 MHz Clock frequency
Input pulse	:	0 to +5 V
No. of channels	:	2048 channels
Lower Level Discriminator	:	0 to 5000 mV System software programmable in 256 steps
Upper level Discriminator	:	0 to 5000 mV System software programmable in 256 steps

Computer Interface

Ethernet RJ45 Connector	:	CAT6 Ethernet cable to connect Spectrometer to PC/Laptop for Alpha Spectrum Acquisition, display and Processing

- *Dark current measurement will be introduced soon. Contact factory for confirmation*

Due to continuous R&D, specifications are likely to change without notice

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