SEM Information

Instrument Package

Pemtron LV/HV Scanning Electron Microscope, PS-230AL
Rotary Vane Vacuum Pump & Science Desk

The PS-230 model was manufactured by the Pemtron Corporation which also manufactures a variety of inspection and precision measurement equipment for the electronics industry, and for nano and bio-based applications.
http://www.pemtron.com/en/product/pro04.php

PEMTRON CORPORATION SEMART USER MANUAL

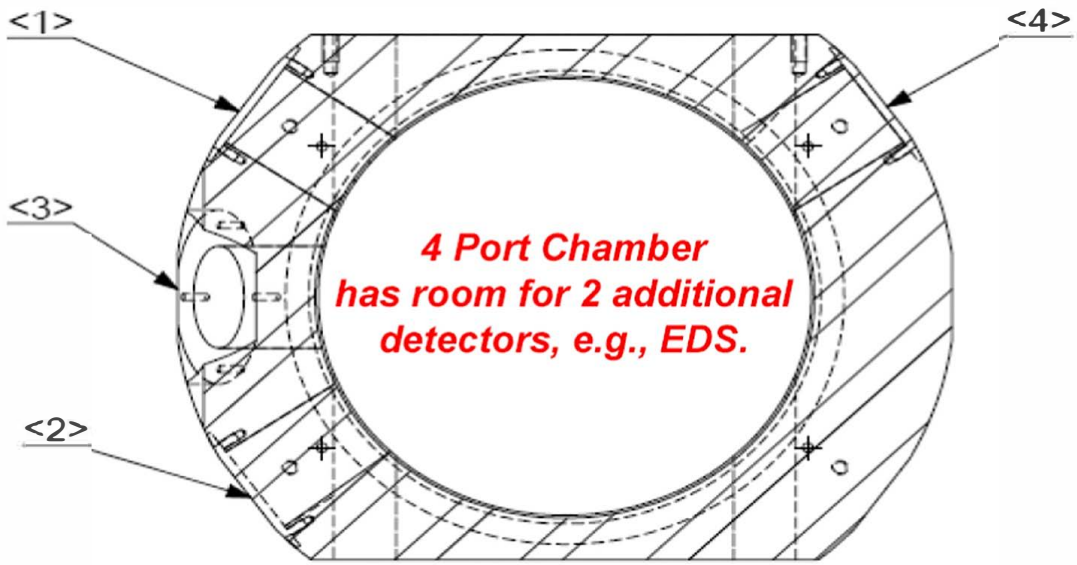
1 - 1. System Specification

Performance		
Model	PS-230	
	Motorize 5 axis	
Resolution	3nm	
Magnification	10x ~ 300,000x	
Detector	SE Detector / BSE Detector	
Electron Optic System		
Acceleration Voltage	0.5kV ~ 30kV	
Electron Gun Type	W Hairpin Filament (Cartridge Type)	
Lens System	3 Lenses De-magnifying System	
Objective Aperture	30/50/100/200um (Variable Aperture)	
Automation Function	Auto Start, Auto Focus, Auto Contrast/Brightness, Auto Stigmation ,	
Display System		
Reduced-Focus Mode	320 x 240 pixel	
Video Mode I, II	800 x 600 pixel	
Photo Mode 1, 2, 3, 4	800x600 / 1280x960 / 1600 x 1200 / 3200x2400 / 5120 x 3840 pixel	
Specimen Position Handling System		
X/Y/Z Travel Distance	±25/±20/40mm	
Rotation	360°	
Tilt	-10° ~ +90°	
Motorizing Control*	X, Y, Z, Rotation	
Max. Specimen Size	Diameter x Height = 100x 52mm	
Vacuum System		
Vacuum Control	Full Automation	
Pump	Oil rotary pump + Turbo molecular pump	
Control System		
Control PC & Monitor	Desktop PC / Dual Core / Windows 7 Pro / Monitor	
Software Functions	System Control / Recipe / Image Processing / Measurement	
Utility Requirements		
Power	187V ~ 253V(50/60Hz)	
Power Consumption	Max 1.5kW	
Room Temperature	15° ~ 30°	
Relative Humidity	70% or less	
Dimension	W x D x H = 600 x 850 x 1390mm	

The 4 Port Chamber has room for 2 additional detectors, e.g., EDS.

3 – 4. Signal Detector

Chamber Cross-section Drawing



<1> SE Detector ***(Included in Purchase)***

SED gathers secondary electrons. (Ejected from the specimen atom by interaction with incident electrons with low energy of <50eV)

<2> BSE Detector ***(Included in Purchase)***

BSED gathers backscattered electrons.(Some of incident electrons are reflected or back-scattered out of the specimen, these are called back scattered electron)

There are different type of the BSE detector such as Solid –State Diode and Robinson,

<3> EDS*, EDX Detector ***(System Capable - EDS Not Included)***

EDS(Energy Dispersive Spectroscopy) or EDX(Energy Dispersive X-ray Microanalysis)

After the electron has been ejected, the atom is left with a vacant energy level. This vacancy is subsequently filled by an electron from a higher energy level with the emission of a characteristic X-ray photon. Characteristic x-rays emission consists of a series of X-ray spectral lines with discrete frequencies, characteristic of the emitting atom.

EDS(Energy Dispersive Spectroscopy) or EDX(Energy Dispersive X-ray Microanalysis) calculate the original energy of the X-ray.

<4> Other Detectors ***(System Capable - Not Included)***