

Hitachi Model S-3400N PC-Based Variable Pressure Scanning Electron Microscope

- Guaranteed Resolution:** 3.0nm, (SED Image in High Vacuum Mode at 30kV)
 4.0nm, (BSED Image in VP Mode at 30kV)

- Chamber Size:** Specimen size of 200mm in diameter can be inserted.

	Type I	Type II
X Traverse	80mm	100mm
Y Traverse	40mm	50mm
Rotation	360° Continuous	360° Continuous
Z Traverse	5 – 35mm	5 – 65mm
Tilt Range	-20° to +90°	-20° to +90°
Motorization	Manual	5-Axis Eucentric
Observable Area	106mm dia.	130mm dia.
Max. Sample Height	40mm	85mm

- System Operation:**
- Microsoft® Windows® XP Professional (SP3)
 - Intel® Core™ i5-650 Processor 3.20GHz
4GB DDR3-1333 ECC RAM, 250GB SATA hard drive,
16X SATA SuperMulti Drive, Gigabit Ethernet, 8 USB
ports.
 - Standard Mouse, Full Knob-set and Keyboard Operation

- Vacuum System:**
- One turbomolecular pump rated at 210 liter/sec
 - One 162 liter/min large-capacity rotary pump
 - Fully automatic pneumatic valve operation with
self-contained air compressor
 - Full safety interlock
 - 6Pa to 270Pa selectable in the Variable Pressure range
 - Chamber pump down time ~90 seconds

- Magnification Range:** 5X to 300,000X Magnification

- SE Detector:** Everhart-Thornley secondary electron detector

- SE Accelerator Plate:** Improves collection of secondary electron signal for
improved low voltage imaging.

- BSE Detector:** Super thin five-segment solid-state detector with 3 modes of operation: Compositional, Topographic and 3D. Each one of the five segments can be individually controlled, with bias set to plus, minus or off.

- ESE Detector:** **Optional**, environmental SE detector allows imaging of samples in the variable pressure mode.

- Electron Source:** Pre-centered tungsten hairpin type

- Accelerating Voltage:** 300V to 30kV

- Gun Bias:** Continuously variable bias, plus the Hitachi patented “**Quad-Bias**” **Circuit** which provides enhanced emission current at 3kV, 5kV and 15kV for superior low voltage imaging and analytical capability.

- Gun Alignment:** 2-Stage Electromagnetic Alignment
One button automatic filament saturation and gun Alignment.

- Condenser Lens:** 2-Stage Electromagnetic Condenser Lens with both Coarse and Fine Control.

- Objective Lens:** Super conical 50° lens.

- Electronic Image Shift:** Electronic image shift of +/-50um at the analytical working distance of 10mm.

- Objective Lens Aperture:** 5-Position (four apertures + open) self-aligning, click stop, single piece strip aperture. One button, electronic Automatic Aperture Alignment function (AAA).

- Stigmator Coils:** 8-Pole Electromagnetic X/Y correction for astigmatism, one button Automatic Stigmator Alignment function.

- Analytical Chamber:**
 - Nine ports to accommodate EDS, WDS (Full Focusing/PBS), EBSD and other accessories.
 - Three 35° Take Off Angle analytical ports, 10mm analytical WD.
 - Digital Beam Control (DBC) provides interface for EDX unit for external scan control.

- Automatic Functions:**
- Automatic Brightness and Contrast Control (ABCC)**
A one-button control automatically sets the viewing and photo image brightness and contrast level that can be defined by the user.
 - Automatic Focus Control (AFC)**
A one-button control automatically adjusts coarse or fine focus. Lens hysteresis is automatically eliminated each time the AFC is activated. A search function is provided for fast and accurate focus adjustment.
 - Automatic Stigmator and Focus Control (ASF)**
A one-button control quickly and accurately automatically adjusts focus and stigmatism of image.
 - Automatic Filament Saturation (AFS)**
A one-button control automatically adjusts precise filament saturation point. Three levels of saturation intensity can be selected to insure longer filament life, best resolution or high throughput for EDX mapping.
 - Automatic Beam Alignment (ABA)**
Automatically adjusts gun tilt and gun horizontal.
 - Automatic Beam Setting (ABS)**
A one-button control automatically adjusts gun horizontal gun tilt, filament saturation and gun bias.
 - Automatic Objective Aperture Alignment (AAA)**
Automatically aligns objective lens aperture.
 - Auto Beam Blanking**
Automatically deflects the electron beam whenever a live image is not displayed to reduce or eliminate beam damage to “beam sensitive” samples.
- Display Monitor:**
- One 19” LCD.
- Signal Mixing:**
- Provides composite image of two different signals (BSE, SE or ESED) that can be adjusted in live time and pseudo-colored. Signal mixing can also be accomplished using a saved image.
- Display Modes:**
- Standard, Full screen, Real-Time Dual Image.
- Scan Modes:**
- TV rate** (2 speeds with selectable steps from 1 to 256 frame recursive filtering)
 - Fast Scan**
 - Slow Scan** rate (4 Speeds)
 - Photo Scan**
 - Reduced Area** Scan rate (2 steps)
 - Signal Monitor**

Linescan (SE, BSE or X-ray)
Split-Screen Live time scan
Dual Magnification Scan
Raster Rotation
Dynamic Focus
Tilt Compensation

Image Saving:

- Pixel Resolution:**
 - Quick Save 640 x 480
 - Standard Resolution 1280 x 960
 - High Resolution 2560 x 1920
 - Ultra High Resolution 5120 x 3840
- Frame Integration** (Selectable from 2 to 1024 frames)

Image Archiving:

- SEM Data File Manager** (standard)
- PCI Image Management System** (standard)
Database management of any electronic data from the microscope. Provides full alphanumeric annotation, graphics, measurement (point-to-point and angular), stereo pair generation, import/export of electronic documents, colorization, image optimization as well as job submission and tracking. PCI can import/export any of the following image formats into the database: *.BMP, *.CUT, *.EPS, *.GIF, *.IFF, *.JPG, *.PCT, *.PCD, *.XPM, *.PCX, *.PSD, *.RAS, *.TIG, *.TGA, *.TIF, *.WMF, *.WPG, and *.XBM.

Image Processing:

- Pseudo color**
- Digital Zoom**
Provides high magnification field zoom.
- Digital Contrast and Brightness**
Allows adjustment of contrast and brightness in a saved image.
- Local Contrast**
Technique that obtains information from shadowed areas of the image.
- Image Cropping and Resizing**
- Memory Photo**
Provides retrieval of digital image to the photo CRT.
- Gamma Control** (real time scan)
Non-linear enhancement of median level signal components with suppression of under and over-saturated values.
- Differential**

Differential scan provides edge enhancement of specimen image.

- Polarity Image**
Reverses signal polarity from black to white and visa versa.
- Real-time Histogram**
Provides a graphic display of contrast and levels that can be adjusted to improve image quality in real time.
- Measurement and Annotation Functions**
Input of text, graphics and measurements on a live or memory image.
- Data Edging**
Enhances text and graphics against image background.
- Birds Eye View**
Provides 3D image information on a saved image.

Report Generation: Two report generation features are available as standard.

Operator Assist Functions:

- Stage Memory (Type II)**
Up to 200 positions with comment can be saved in the stage memory.
- Move Stage (Type II)**
The stage will move to the same position at which the selected thumbnail in image capture box was acquired.
- Image Navigator (Type II)**
Captures a low magnification reference image that is used with the mouse to direct the stage to the desired position and magnification. Also allows image from a digital light microscope or camera to be imported and used for navigation within the SEM.
- 3D Maintenance Videos**
Provides user with 3D animations and step-by-step instructions for completing basic maintenance procedures.
- Condition Save Files**
Allows storage and instant recall of microscope operating parameters or “recipes”, includes sample image.
- Magnification Preset**
Two user-defined presets.
- NTSC Video Output**
Provides NTSC output for a TV, thermal printer, video capture system or VCR recorder without data-display.
- Password Protection**

- Beam Wobbler**
Beam wobbler aids in alignment of objective aperture in manual mode.
- Filament Image**
Provides image of filament to check cleanliness of apertures and column alignment.

Power and Safety:

- Auto Transformer**
Accepts 100 to 220 Volt single-phase input with a 2.0kVA power requirement.
- Safety Interlocks**
Provides interlock safety against overheating as well as air and power failures.
- Rapid Start**
Six minutes from cold start (all power off) to HV ready.
- Anti-Vibration System**
Reduces vibration from environmental sources.

Spare Parts Kit:

- Complete spare parts kit necessary for routine maintenance of the S-3400N. Includes the following:
10 pre-centered cartridge filaments, 20 condenser apertures.

Installation and Training: Includes installation of equipment and operations and maintenance training by a certified field service engineer.

Warranty: One full year parts and labor

All specifications subject to change without notice