The New Dimension in Image Quality

Unparalleled Image Quality
- Novel and innovative electron optics and image display rendering engine

Robustness & Versatility
- Image observation and analysis without traditional specimen preparation techniques

Intuitive Operation
- Delegation technology affords easy operation and increased throughput efficiency

4-axis Motor Drive Stage (55 mm x 55 mm)
Enhanced navigation via new analytical chamber and automated stage functions

Point and click for seamless, real-time 3-D SEM image observation
The electron optics design yields unmatched imaging performance. The SU3500 employs a new low-aberration objective lens and improved bias function that provides higher emission current at low kV. These improvement gains allow the SU3500 to achieve 7 nm SE image resolution at 3 kV accelerating voltage and 10 nm BSE image resolution at 5 kV accelerating voltage.

Maximizing Signal Intensity

High imaging performance at low accelerating voltage

The emission current extracted from a tungsten filament is proportionally reduced as the accelerating voltage is decreased; therefore, the image signal-to-noise ratio is typically compromised. The SU3500 employs a Hex Bias system that optimizes the emission current at 6 frequently used acceleration voltage levels for optimum brightness. The result is best-in-class image sharpness (S/N) at low accelerating voltages.

Previous model

SU3500

20 sec Scan,
Accelerating Voltage 1.5 kV
Magnification: x 110
Sample: Copepod
With Ionic liquid
CS® Scan minimizes beam irradiation surface damage

CS Scan mode decreases charging and enhances image quality by reducing the beam (primary electron) dwell time per pixel. This automated scanning process preserves sample imaging integrity by seamlessly integrating multi-horizontal line signals from high-speed scans.

Electromagnetic aperture alignment mechanism

Alignment of the primary beam within the center of the movable objective aperture is critical for minimizing astigmatism and generating high quality SEM images. Traditionally, this alignment is performed by mechanically adjusting the objective aperture. The SU3500 employs an innovative electromagnetic beam alignment system offering easily controlled, precise fine-tuning for optimum positioning. A convenient “reset” function provides a quick course starting point, if needed.

Novel image display engine allows fast and easy focusing and astigmatism correction

The SU3500 incorporates a revolutionary Image Signal Processing function (25/30 frames/sec)** for image optimization on the fly. Focus and astigmatism correction can be easily accomplished during real-time image observation.

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*1 Comparison S-3400N manufactured in 2013  *2 Charge Suppression  *3 25 frame:50 Hz, 30 frame:60 Hz
Highly efficient Automatic Focus Control (AFC) and Auto Brightness/Contrast Control (ABCC) functions

More accurate and faster AFC and ABCC algorithms enable optimized image observation and higher throughput.

**Former System**
- **ABCC**: 10 sec
- **AFC**: 8 sec

**SU3500**
- **ABCC**: 4 sec
- **AFC**: 3 sec

Reduced times:
- 6 sec reduced
- 5 sec reduced
- 11 sec reduced

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**Increased condenser lens dynamic range offers improved imaging efficiency**

The SU3500 utilizes a new, more robust condenser lens abating field of view or focus deviations during accelerating voltage and probe current condition adjustments. These imaging efficiency gains simplify the overall imaging optimization process and improve the user experience.
Application Data: High Vacuum Mode

Sample: ZnO
Accelerating Voltage: 5 kV, Magnification: x 30,000,
Signal: Secondary Electron (SE), Without metal coating

Sample: Helicobacter bilis
Accelerating Voltage: 2 kV,
Magnification: x 17,000, Signal: Secondary Electron (SE), With O2O coating
Sample courtesy: Prof. Yoshiaki Kawamura,
Aichi Gakuin University

Sample: Gold-isocyanide Complex
Accelerating Voltage: 0.8 kV, Magnification: x 2,100,
Signal: Secondary Electron (SE), Without metal coating

Sample: Titanium Oxide Particle
Accelerating Voltage: 3 kV,
Magnification: x 15,000, Signal: Secondary Electron (SE), Without metal coating
Sample courtesy: Prof. Masato Kakehina, Tohoku University

Sample: Al2O3/Fe2O3 sintered body
Accelerating Voltage: 3.0 kV,
Magnification: x 20,000, Signal: Secondary Electron (SE), Without metal coating
Sample courtesy: Prof. Minoru Fukuhara,
Okayama University of Science

Sample: Copper gasket cross section
Accelerating Voltage: 1.5 kV, Magnification: x 5,000,
Signal: Backscattered Electron (BSE), Without metal coating

※1 Comparison S-3400N manufactured in 2013.
※2 AFC and ABCC throughput may vary depending on various factors.
Low Vacuum Mode

**Low Vacuum Mode Advantages**

The SU3500 incorporates variable pressure capability. The newly designed vacuum system enables low vacuum settings within the range of 6-650 Pa. The vacuum condition is actively monitored in real-time for maintaining stable vacuum levels at the selected pressure.

- Charging is mitigated on non-conductive specimens without metal coating.
- Metal coating, such as Au or Pd, absorbs SE, BSE, and X-ray signals from the specimen and weakens SEM detectable signals.
- X-ray analysis: Peak overlapping is minimized without metal coating.

**EDS Spectrums with metal coating:**
Spectrums of Zr and Pt (coating material) are overlapped.

**EDS Spectrums without metal coating:**
Spectrums of Zr can be clearly identified.

**Sample:** Photocatalytic Fiber

- High Vacuum mode without metal coating: Image distortion due to surface charging.
- Low Vacuum mode without metal coating: Less specimen surface charging.

**Operating theory of Low Vacuum mode**

Utilizing a low vacuum environment can allow observation of water or oil based specimens in their natural state. The positively charged ions originated from the residual gas molecules generated by the electron beam neutralize the negatively charged electrons on the specimen surface. Low vacuum observation often eliminates traditional sample preparation requirements such as specimen dehydration or metal coating.

- Neutralization of specimen surface by positive ions
- Prevention of specimen surface charging
- Low pressure environment
- Wet, oily specimens can be observed with less evaporation
Application Data: Low Vacuum Mode

Sample: Filler (Glass fibers) in Resin
Accelerating Voltage: 5 kV, Vacuum: 50 Pa,
Magnification: x 1,000, Signal: Backscattered Electron (BSE),
Without metal coating

Sample: ABS Resin
Accelerating Voltage: 10 kV, Vacuum 40 Pa,
Magnification: x 20,000, Signal: Backscattered Electron (BSE),
With GaOx staining

Sample: Cross section of Printed Circuit Board
Accelerating Voltage: 5 kV, Vacuum: 30 Pa,
Magnification: x 150, Signal: Backscattered Electron (BSE),
Without metal coating
Using the Hitachi Ion milling system IM4000

Sample: Cross section of Printed Circuit Board
Accelerating Voltage: 3 kV, Vacuum: 20 Pa,
Magnification: x 5,000, Signal: Backscattered Electron (BSE),
Without metal coating
Using the Hitachi Ion milling system IM4000

Sample: Photocatalytic Fiber
Accelerating Voltage: 1.5 kV, Vacuum: 20 Pa,
Magnification: x 1,000, Signal: Backscattered Electron (BSE),
Without metal coating

EDS: APEX (Option), manufactured by EDAX from AMETEK, Inc.
The unmatched Ultra Variable-Pressure Detector (UVD, optional)

By detecting the excited light emitted from collisions between electrons and gas molecules, complementary secondary electron information can be obtained. The new, highly-sensitive Ultra Variable-Pressure Detector is optimized for imaging surface details at low acceleration voltages and low pressures.

**Application Data: UVD**

Sample: Polyvinyl Alcohol, Accelerating Voltage: 3 kV, Vacuum: 60 Pa, Magnification: x 1,000, Signal: Backscattered Electron (BSE), Without metal coating

Sample: Rat primary hepatocytes cultured on Silica fiber nonwoven fabrics, Accelerating Voltage: 5 kV, Vacuum: 30 Pa, Magnification: x 1,500, Signal: Ultra Variable-Pressure Detector (UVD), Without metal coating, Sample courtesy: Japan Vilene Co., Ltd.

Sample: Thread sealing tape (extended), Accelerating Voltage: 3 kV, Vacuum: 30 Pa, Magnification: x 10,000, Signal: Ultra Variable-Pressure Detector (UVD), Without metal coating
Low Vacuum range extended to 650 Pa

Cooling specimens (0 ~ −20 °C) is often utilized to minimize vaporization effects during imaging under vacuum. The SU3500, with a pressure range up to 650 Pa, offers the flexibility to image samples at 0 °C (vapor pressure of 0 °C region is 611 Pa, as shown below).

Application Data: Low Vacuum Cooling

Dried Sample

Hydrated Sample
(purified water, 5 μL)

Sample: Superabsorbent polymer
Accelerating Voltage: 20 kV, Vacuum: 650 Pa
Magnification: x 60, with cooled: -4 °C

※1 Comparison S-3400N manufactured in 2013.
**Improved Visibility and Operation with a 24 inch Wide Screen**

Wide screen display offers large, single image, or simultaneous multi-image observation.

**Real-time multi-signal processing and display**

Single image, dual image, quadruple image, and full screen image display layouts are available. This allows multi-signal, simultaneous image observation for real-time image comparison.

- **Single Image display (800 x 600 pixels)** Good for finding observation target or focus adjustment.
- **Dual image display (800 x 600 pixels x 2)** Two different signal of live images are displayed simultaneously. This allows effective image comparison like the SE/UV for surface info or BSE compositional image.
- **Quadruple image (640 x 480 pixels x 4)** Real time 4 different image display for effective multiple image comparison, for example, SE image, BSE compositional image, BSE topographic image, and BSE 3D image.
- **Full screen image (1,280 x 960 pixels)** Real time high resolution & large sized image display suitable for observing the image with multiple users.
Unique live signals can be mixed and displayed as a combined live image

Multiple live signals for the same view can be mixed and displayed as one combined live image. This allows effective image analysis with multiple signals in one image; for example, the secondary electron (SE) providing surface rich information, and the back scattered electron (BSE) signal for compositional information. (outlined picture in red: SE and BSE mixed image)

Two-way selectable Magnification Display

Two selectable magnification displays available based on either the conventional Polaroid Size (127 mm x 95 mm) or the image size on the LCD screen.

Ease of Use

User customized icon setting

User customized icon selection and settings optimize operation efficiency based on need, preference, and frequency of use.

※1 An impression of easy operate varies between individuals.
"Operation Guide" allows inexperienced users to easily select the optimum operating conditions.

Six commonly used operating condition sets are pre-registered on the SU3500 by Hitachi. This allows users to quickly find basic operating conditions. The user defined conditions can then be registered and retrieved for quick, subsequent start-ups.

The Operation Guide Wizard provides assistance as needed for effortless operation regardless of user experience.

![Guide screen for focus adjustment](image1)

![Guide screen for astigmatism correction](image2)

**Tips**

**Operation Wizard**

The SU3500 Operation Wizard provides helpful tips with illustrative guides for recommended focusing or astigmatism correction procedures, further improving the efficiency and overall user-experience for both expert and novice users.
Auto Start function

“Auto Start” executes electron beam irradiation, adjustment of focus, brightness, and contrast automatically at the selected accelerating voltage.

Operation Panel is a standard component

The Operation Panel integrates all the necessary controls (scan speed, auto brightness and contrast, focus, magnification, and image capture and save) into one convenient location on the SEM console.

Video Maintenance Wizard Guide provides accurate and easy to understand maintenance instruction

User maintenance is easily accomplished by following the video instructions.

Filament exchange

Condenser lens aperture exchange

Alignment

※1 An impression varies between individuals.
SU3500 offers 2 unique motorized stages

**Eucentric 5-Axis Motorized Stage**

- X: 0 ~ 100 mm
- Y: 0 ~ 50 mm
- Z: 5 ~ 65 mm
- R: 360°
- T: -20 ~ 90°

Observation Area: 130 mm in diameter (with rotation)
Maximum height: 80 mm (WD=10 mm)
Motor driven axis: 5-axis (X, Y, Z, R, T)

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**Eucentric 4 axis Motorized Stage**

- X: 0 ~ 55 mm
- Y: 0 ~ 55 mm
- Z: 5 ~ 55 mm
- R: 360°
- T: -20 ~ 90°

Observation Area: 77 mm in diameter (with rotation)
Maximum height: 70 mm (WD=10 mm)
Motor Driven axis: 4-axis (X, Y, R, Z)
**Multi-function Specimen Stage**

The robust SU3500 analytical chamber accommodates EDS**, WDS**, and/or EBSD** simultaneously. The chamber is optimized for Analytical Position of WD=10 mm for EDS, WDS. A minimum magnification of 27 x is available at that WD; therefore, targeted analytical positions can be identified with the wide field of view.

**EDS, WDS, and EBSD**

EDS, WDS (offering an order of magnitude greater energy resolution), or the Kikuchi pattern attained via EBSD are utilized for micro detection of elements and crystal orientation.

**Dual EDS Detector**

Taking advantage of the Dual EDS detector configuration offers an increase in the characteristic x-rays detected (signal) and mitigates any shadowing effects.


EDS: Octane, manufactured by EDAX from AMETEK Inc.

※1 Energy Dispersive X-ray Spectrometer  ※2 Wavelength Dispersive X-ray Spectrometer  ※3 Electron Backscatter Diffraction systems
Eucentric 5-Axis Motorized Stage

1. X-Y, Tilting(T), Rotation(R), Height(Z) Control
   By track ball (joystick as an option), a mouse control or numerical data input.

2. X-Y Step Move control
   Stage movement by specified step distance at each click. Effective for repeated pattern observation.

3. Z focus link
   The image is kept in focus while Z position is changed.

4. Programmed Eucentric Tilt/Rotation
   The image field of view is maintained as the stage is tilted or rotated.

5. Graphic display of observation point
   The relative position of the specimen and the objective lens is graphically displayed.

“Image Navigation Function”

“Image Navigation Function” enables the operator to find the observation target quickly by navigating the stage based on low magnification optical scope or digital camera image. The available file formats are BMP, JPEG, and TIFF.

“Stage Navigation Function”

The “Stage Navigation Function” keeps track of X/Y stage coordinates and displays the current stage coordinates and previously visited coordinates. “Stage Navigation Function” allows the user to revisit previously visited positions quickly and easily.
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### RISM and ZOOM Function

**RISM (Rapid Image Shift Mode):**
The area of interest is moved to the screen center by clicking the area of interest.

- Click the area of interest to move it to the screen center
- Drag the area of interest to move it to any screen position

**ZOOM:**
The area of interest enclosed by mouse dragging is automatically centered and enlarged on the live image.

- Dragged area is moved to the screen center and enlarged

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### Returning the stage to the previously image captured positions

The last 100 images captured are automatically saved with the stage coordinates. The stage is able to move to the coordinates previously visited once the image of interest is selected. (ex. The image outlined in yellow from the images outlined in red is selected to move the stage to the previous coordinates)

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### Wide area SEM images (optional)

Smaller area SEM images are automatically and continuously stored. Subsequent wide area SEM images are created by "stitching" together the stored smaller images.

- Total 192 images (16 x 12) automatically stored.
- Wide area SEM image can be created after stitching 192 images.

#### Metal cross section
Accelerating Voltage : 15 kV, Magnification : x 700

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[i] The 4-Axis Motorized stage : Tilting angle is manually set.
Live Stereoscopic Image Function (Optional)

Live stereoscopic image function enables real-time 3-D SEM imaging without tilting the specimen. This proprietary, rapid scanning technology was developed as a part of the national project of Japan Science and Technology Agency. Patent: JP5183318, US8143573

Sample: Brass fracture surface

3-D Scan Function Principle

Live stereoscopic images are generated by rapidly alternating the electron beam tilt angle to yield left and right parallax images. The parallax images are then synchronized and observed directly with red and blue spectacles or a 3-D monitor. This instantaneous, automated scanning process is significantly faster and easier than manually tilting the specimen and re-imaging.
Application Data: Live Stereoscopic (3-D) Imaging

Sample: Rat intestine (Replica)
Accelerating Voltage: 5 kV, Magnification: x 350, Signal: Secondary Electron (SE)
Sample courtesy: Ms. Noriko Nemoto, Bio-imaging Center, Kitasato University

Sample: Rat primary hepatocytes cultured on silica fiber nonwoven fabrics
Accelerating Voltage: 5 kV, Vacuum: 40 Pa, Magnification: x 4,200,
Signal: Ultra Variable-Pressure Detector (UVD)
Sample courtesy: Japan Vilene Company, Ltd.

Sample: Modacrylic fiber porous
Accelerating Voltage: 5 kV, Magnification: x 1,000,
Signal: Secondary Electron (SE)

Sample: Textile
Accelerating Voltage: 5 kV, Vacuum: 50 Pa,
Magnification: x 100, Signal: Ultra Variable-Pressure Detector (UVD)

Sample: Diatom (Arachnoidiscus sp.)
Accelerating Voltage: 5 kV, Vacuum: 30 Pa, Magnification: x 2,000,
Signal: Ultra Variable-Pressure Detector (UVD)

Sample: Green mold
Accelerating Voltage: 3 kV, Magnification: x 1,300,
Signal: Secondary Electron (SE)Ionic liquid treated
A 3-dimensional image is generated using 4 directional surface profiles from the signals acquired with each segment of the 4-segment backscattered electron detector. Positional misalignment compensation, as with mechanical specimen tilting, is not necessary with this function. Additionally, the SU3500 live signal mixing enables the capture of 4 images simultaneously (not sequentially)\(^1\). The function can also be applied to higher magnifications.

**3D-VIEW Application**

- BSE Image and CD measurement profile
- Bird's-eye view
- Sample: \(\text{Al}_2\text{O}_3\)-Ni Alloy

### 3D-VIEW main specifications

<table>
<thead>
<tr>
<th><strong>3D-Image viewer function</strong></th>
<th><strong>Items</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Import function</td>
<td>Automatic select and read function of four elements image data (Equipped with automatic SEM condition acquisition function)</td>
<td></td>
</tr>
<tr>
<td>Measurement performance</td>
<td>Depth accuracy ± 20% (Reference) Measurement performance is different depending on calibration accuracy, the condition of the kind of the specimen, the observation mode, and the observation condition. Detectable angle range: ±60° (Reference) Observation condition: Accelerating Voltage: 15 kV, Magnification: x 500, Sample: Vickers indentation</td>
<td></td>
</tr>
<tr>
<td>Measurement function</td>
<td>Section profile display / Calibration function (X/Y, Z and Flat) / Distance of X and Y, length and angle measurement between two points specified on the image / Surface area measurement / Distance of X and Y, length and angle measurement between two points specified on section profile / Surface roughness measurement on section profile / Depth direction zoom-in function on section profile display / Base line correction function (straight line and curved line) / Bird's-eye view display / Color contour line display</td>
<td></td>
</tr>
<tr>
<td>Three-dimensional display function</td>
<td>Rotation and zoom-in / Animation record function of observation screen (AVI file)</td>
<td></td>
</tr>
<tr>
<td>PC OS</td>
<td>Windows(^*) 7 Professional</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>3D-Image capture function</strong></th>
<th><strong>Items</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Capture function</td>
<td>Automatic image data acquisition by four elements of quad BSE detector</td>
<td></td>
</tr>
<tr>
<td>Capture pixel count</td>
<td>640 × 480 pixels (Quick Save), 1,280 × 960 pixels (Save)</td>
<td></td>
</tr>
<tr>
<td>Brightness adjustment</td>
<td>Automatic</td>
<td></td>
</tr>
</tbody>
</table>

* A steep topographical surface that exceed detectable angle might not be displayed accurately.
* Windows\(^*\) is a registered trademark of Microsoft Corporation in the United States and/or other countries.

\(^1\) Comparison S-3400N manufactured in 2013.
Specifications

<table>
<thead>
<tr>
<th>Items</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution SE</td>
<td>3.0 mm at 30 kV (High vacuum mode)</td>
</tr>
<tr>
<td></td>
<td>7.0 mm at 3 kV (High vacuum mode)</td>
</tr>
<tr>
<td></td>
<td>15.0 mm at 1 kV (High vacuum mode)</td>
</tr>
<tr>
<td>Resolution BSE</td>
<td>4.0 mm at 30 kV (Variable pressure mode)</td>
</tr>
<tr>
<td></td>
<td>10.0 mm at 5 kV (High vacuum mode)</td>
</tr>
<tr>
<td>Magnification</td>
<td>x 5 ~ 300,000 (on photo*)</td>
</tr>
<tr>
<td></td>
<td>x 7 ~ 800,000 (on display*)</td>
</tr>
<tr>
<td>Accelerating voltage</td>
<td>0.3 ~ 30 kV</td>
</tr>
<tr>
<td>Variable pressure range</td>
<td>6 ~ 680 Pa</td>
</tr>
<tr>
<td>Image shift</td>
<td>±50 µm (WD=10 mm)</td>
</tr>
<tr>
<td>Maximum specimen size</td>
<td>200 mm in diameter</td>
</tr>
<tr>
<td>Specimen stage</td>
<td>5-Axis Motorized stage</td>
</tr>
<tr>
<td>X</td>
<td>0 ~ 100 mm</td>
</tr>
<tr>
<td>Y</td>
<td>0 ~ 50 mm</td>
</tr>
<tr>
<td>Z</td>
<td>5 ~ 65 mm</td>
</tr>
<tr>
<td>R</td>
<td>360°</td>
</tr>
<tr>
<td>T</td>
<td>-20 ~ 90°</td>
</tr>
<tr>
<td>Observation area</td>
<td>130 mm in diameter</td>
</tr>
<tr>
<td>Maximum height</td>
<td>80 mm (WD=10 mm)</td>
</tr>
<tr>
<td>Stage control</td>
<td>Computer eucentric</td>
</tr>
<tr>
<td>Electron gun</td>
<td>Pre-centered cartridge filament</td>
</tr>
<tr>
<td>Objective aperture</td>
<td>5-position, click stop objective aperture</td>
</tr>
<tr>
<td>Gun bias</td>
<td>Auto bias with variable bias control</td>
</tr>
<tr>
<td>Detectors</td>
<td>Everhart-Thorley secondary electron detector</td>
</tr>
<tr>
<td>Analysitic position</td>
<td>10 mm (T.O.A.=35°)</td>
</tr>
<tr>
<td>Display unit</td>
<td></td>
</tr>
<tr>
<td>OS</td>
<td>Windows® 9, 9.1 (subject to change without notice)</td>
</tr>
<tr>
<td>Control</td>
<td>Mouse, Keyboard, Rotary knob, Track-ball</td>
</tr>
<tr>
<td>Monitor</td>
<td>24 inch LCD or equivalent (subject to change without notice)</td>
</tr>
<tr>
<td>Auto alignment</td>
<td>Auto beam alignment</td>
</tr>
<tr>
<td>Auto image adjustment</td>
<td>Auto focus, auto stigmation/focus, Auto brightness &amp; contrast</td>
</tr>
<tr>
<td></td>
<td>Auto filament saturation, Auto start</td>
</tr>
<tr>
<td>Image data saving</td>
<td>640x480 pixels, 1,280x960 pixels, 2,560x1,920 pixels, 5,120x3,840 pixels</td>
</tr>
<tr>
<td>Fileformat</td>
<td>BMP, TIFF, JPEG</td>
</tr>
<tr>
<td>Image display mode</td>
<td>Full screen display (1,280x960 pixels)</td>
</tr>
<tr>
<td></td>
<td>Small screen display (960x640 pixels)</td>
</tr>
<tr>
<td></td>
<td>Dual screen display (800x600 pixels)</td>
</tr>
<tr>
<td></td>
<td>Quad screen display (640x480 pixels)</td>
</tr>
<tr>
<td>Evacuation system</td>
<td>Fully automated vacuum sequence</td>
</tr>
<tr>
<td>Turbo molecular pump</td>
<td>361 L/s x 1</td>
</tr>
<tr>
<td>Rotary pump</td>
<td>135 L/min (162 L/min with 60 Hz) x1</td>
</tr>
<tr>
<td>Protection</td>
<td>Power failure and vacuum failure</td>
</tr>
<tr>
<td>Auxiliary functions</td>
<td>Raster rotation, dynamic stigmation-monitor</td>
</tr>
<tr>
<td></td>
<td>Dynamic focus/tilt compensation</td>
</tr>
<tr>
<td></td>
<td>Free layout print function, alphanumeric function</td>
</tr>
<tr>
<td></td>
<td>Operated navigation</td>
</tr>
<tr>
<td></td>
<td>Video maintenance</td>
</tr>
<tr>
<td></td>
<td>Easy measurement</td>
</tr>
</tbody>
</table>

Optional accessories

- Detector and analytical tool
- Ultra Variable pressure Detector (UVP)
- Energy dispersive X-ray spectrometer (EDS)
- Wavelength dispersive X-ray spectrometer (WDS)
- Electro backscattered diffraction analyzer (EBSD)
- Infrared chamber scope

Specimen holder and stage

- Cred stage made by third party vendor
- Specimen holder for resin-embedded specimens
- Specimen holder for EBSD

Software

- Hi-Mouse (One keyboard, one mouse)
- External communication interface, DSC
- ZigZag capture
- Stitch software
- CD measurement function
- Live stereo function

Dimensions & weight

<table>
<thead>
<tr>
<th>Items</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Column unit</td>
<td>740 W (W×1,000 (D)×1,540 (H) mm, 465 kg)</td>
</tr>
<tr>
<td>Display unit</td>
<td>1,000 W (W×1,000 (D)×1,370 (H) mm, 513 kg)</td>
</tr>
<tr>
<td>Rotary pump</td>
<td>530 W (W×225 (D)×306 (H) mm, 28 kg)</td>
</tr>
<tr>
<td>Air compressor</td>
<td>415 W (W×210 (D)×615 (H) mm, 18 kg)</td>
</tr>
<tr>
<td>Weight</td>
<td>200 W (W×180 (D)×160 (H) mm, 40 kg)</td>
</tr>
</tbody>
</table>

Rotary pump and Air compressor are not included with main unit depending on its destination.

Installation requirement

<table>
<thead>
<tr>
<th>Items</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room temperature</td>
<td>15 ~ 30 °C</td>
</tr>
<tr>
<td>Humidity</td>
<td>70 % RH or less</td>
</tr>
<tr>
<td>Power supply</td>
<td>Single phase AC 100 V, 200 W or 240 V ±10 %, 2.0 kVA</td>
</tr>
<tr>
<td>Power cable</td>
<td>10 meters long with MS crimp-type terminal</td>
</tr>
<tr>
<td>Grounding</td>
<td>100 Ω or less</td>
</tr>
</tbody>
</table>

Typical installation room layout