

Specifications

	Items	Description
Resolution	SE image resolution	0.4nm (30kV, Sample Height=1.0mm, 800kx) 1.2nm (1kV, Sample Height=2.0mm, 250kx)
	STEM image resolution	0.34nm (30kV, Sample Height=0.0mm, Lattice image)
Magnification		Mag on Photo*1 Mag on Display*2
	LM Mode	80 ~ 10,000x 220 ~ 25,000x
	HM Mode	800 ~ 3,000,000x 2,200 ~ 8,000,000x
Electron optics	Electron gun	Cold cathode field emission source
	Accelerating voltage	0.5 ~ 30kV (0.1kV step)
	Lens system	3-stage electromagnetic lens reduction
	Objective lens aperture	Movable aperture (heating type, 4 openings selectable from outside of vacuum with fine adjustment)
	Electrical image sift	±5μm (Sample Height = 0.0mm)
	Beam blanking	Electrostatic type (synchronized with scanning signal)
Specimen stage	Stage	Side entry goniometer stage
	Stage traverse	X : ±4.0mm, Y : ±2.0mm, Z : ±0.3mm, T : ±40°
	Standard holder	Bulk: 5.0mm x 9.5mm x 3.5mmH Cross-section: 2.0mm x 6.0mm x 5.0mmH
	Dedicated holder	Cross-section specimen holder: 2.0mm x 12.0mm x 6.0mmH Double tilt cross-section specimen holder(L): 0.8mm x 8.5mm x 3.5mmH
Detector	Detector	Secondary electron detector
		Top detector (option)
		BF/DF Duo-STEM detector (option)
		Energy dispersive X-ray detector (option)
Image display	Monitor	24.1 type wide screen LCD (subject to change without notice)
	Full screen display	1,280 x 960pixels
	Single (Dual display)	800 x 600pixels (800 x 600pixels x 2)
	Quad screen display	640 x 480pixels x 4
Display system	OS	Windows®7*3
	Operation system	Mouse, Keyboard, Rotary Knob, Stage controller (Trackball and Joystick combined)
	Image data saving	640 x 480pixels, 1,280 x 960pixels, 2,560 x 1,920pixels, 5,120 x 3,840pixels
	Saved image data management	SEM data manager (image database / image processing function) included
Optional accessories	Dry pump	Anti-contamination trap unit Video amplifier unit
	Air compressor	STEM holder Photomultiplier power supply unit
	Water circulator	Faraday cup

*1 at 127mmx 95mm (4" x 5" Polaroid size)
*2 at 345mm x 259mm (1280 x 960pixels)
*3 Windows®7 is a registered trademark of U.S. Microsoft Corp. in U.S.A and other countries

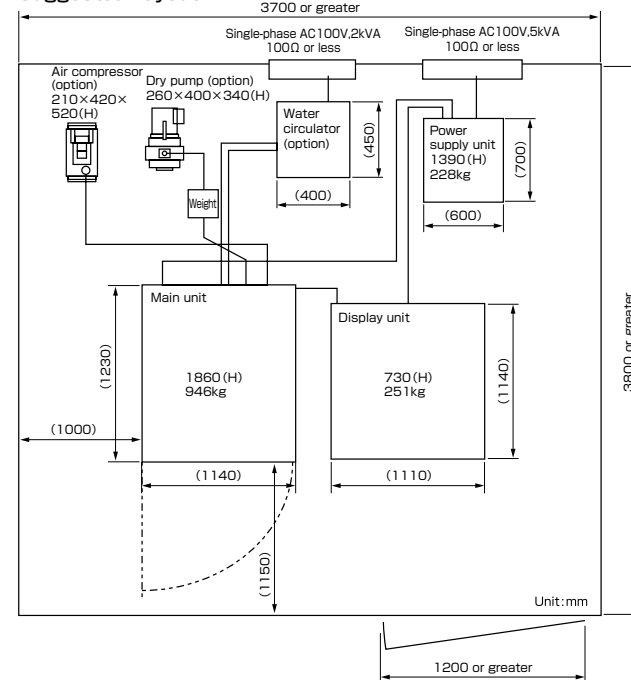
Installation condition

Items	Description
Room temperature	15 ~ 25°C
Humidity	60% RH or less (non-condensing)
Power	5kVA, 50/60Hz, Single phase AC100~240V ± 10%
Grounding	100 Ω or less
Cooling water flow	0.6 ~ 1.0 l/min
Pressure	50 ~ 100kPa
Temperature	15 ~ 20 °C (allowable fluctuations 0.5°C /10min or less)
Supply faucet	Rc3/8 tapered female thread x1
Drain port	(20mm dia. or more) x1 (Natural drain type located on floor)

Dimensions and weight

Items	Width(mm)	Depth(mm)	Height(mm)	Weight (kg)
Main unit	1,140	1,230	1,860	946
Display unit	1,110	1,140	730	251
Power supply unit	660	700	1,390	228
Dry pump (option)	260	400	340	25
Air compressor (option)	210	420	520	16
Weight	200	320	170	20
Water circulator (option)	400	450	670	73

Suggested Layout



Ultra-high Resolution Scanning Electron Microscope

SU9000

Notice: For correct operation, follow the instruction manual when using the instrument.

Specifications in this catalog are subject to change with or without notice, as Hitachi High-Technologies Corporation continues to develop the latest technologies and products for our customers.

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Bringing the frontier to the forefront.

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HITACHI

Bringing the advances of SEM to the forefront

Technological advances in the Semiconductor Industry are occurring at a rapid pace and pushing design and manufacturing tolerances to the nano-scale. These advances require direct observation of the surface structures of the materials at this size scale. Hitachi has a proven track record for providing cutting edge instrumentation that are reliable and that meet the strict imaging requirements of the Semiconductor Industry.

Hitachi has now introduced a new line of instruments with improved CFE gun technologies that further reduce the already low aberration artifacts of existing Hitachi CFE technology.

The new CFE Gun technology featured in the SU9000 achieves the highest SEM resolution in the world. (0.4nm at 30kV)

The reduced aberration effects make high resolution, low accelerating voltage observations possible for beam sensitive materials without the need for deceleration technology. (1.2nm at 1kV)

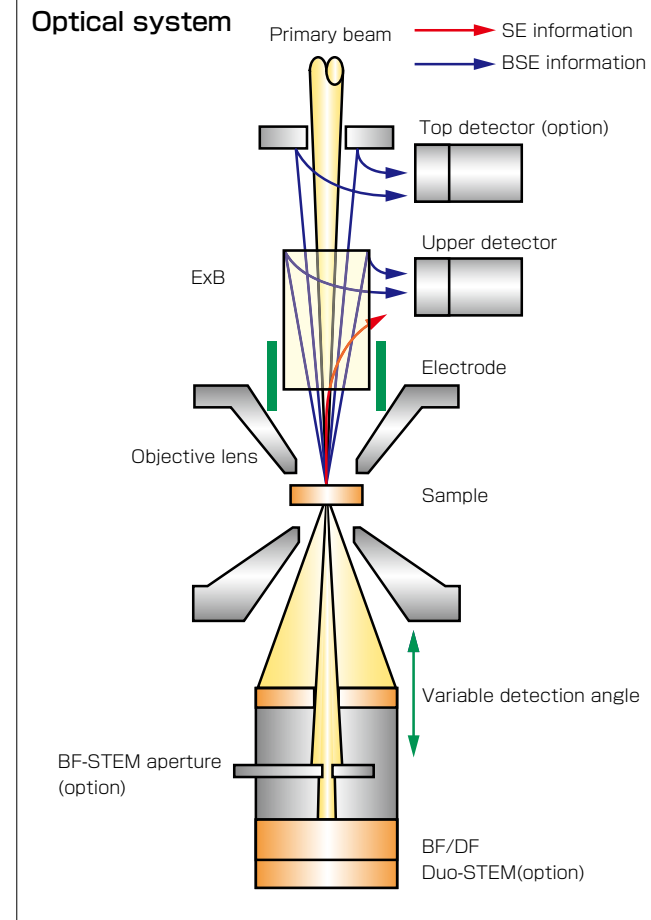
The SU9000 also features STEM (option) performance that guarantees 0.34nm resolution as confirmed through the imaging of graphite lattice ((002) d=0.34nm)

Hitachi is bringing superior fundamental performance such as stable operation, high throughput, and high resolution to the forefront of technology.

The world highest resolution featured in the SU9000: 30kV acceleration voltage condition, has been implemented as of April, 2011

Features

- Superior low-kV performance for observation of beam sensitive materials.
- Next generation Hitachi In-lens SEM optics allows for routine observation at 1 million times.
- Newly designed CFE GUN provides high brightness and extremely stable emission current.
- Improved vacuum technology that allows for ultra-high vacuum levels for reduced sample contamination.
- Highly engineered instrument enclosure featuring both superior strength and stability to allow for high resolution imaging in a broad range of environmental conditions
- Newly designed objective lens provides for high resolution imaging at low acceleration voltage.
- Side entry sample exchange system increases throughput by reducing the time required to change samples and by automatically positioning the sample at the correct WD.



Signal detection system

SU9000 signal detection system makes it possible to tune the electron imaging signal to select the optimal imaging mode. ExB, the core technology of the high efficiency SE detection system, creates enhanced surface imaging to reveal fine surface structures and morphologies.

Super ExB, an energy based signal filtering system, works to eliminate the charge up phenomena in the SEM image and provides composite information about the sample surface - even at low voltages around 500V.

Duo-STEM detector (option) located under the specimen allows BF and DF image acquisition at the same time.

Spectacular Cold FE Gun that have has high brightness and stability.

A new CFE Gun design has increased the source brightness by a factor of 2 or more while also increasing the stability and still maintaining the unsurpassed low energy spread of the standard CFE gun. This added brightness increases S/N adding to the overall ease of use.



Cold field emission tip

In-lens objective lens

Lens designed to improve low voltage imaging, achieving high resolution without deceleration technology

High throughput observation

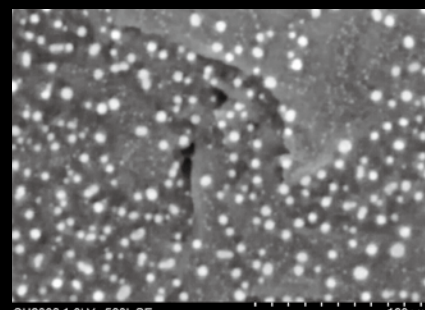
The side-entry exchange automatically positions the specimen holder at the correct position for high resolution imaging. The specimen chamber and side-entry exchange allow for an extremely low vacuum level to be achieved immediately, reducing contamination effects during low voltage observations.



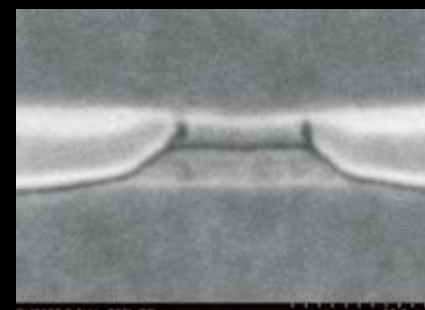
One touch, spring action, specimen mounting

Comfortable operation system

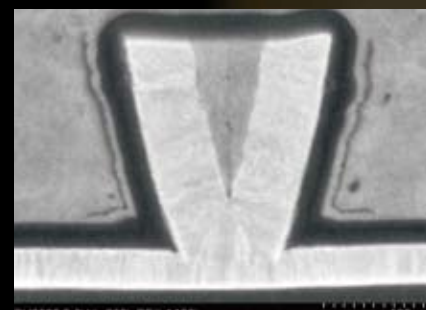
Trackball and joystick are combined in a single unit. A trackball is suitable for fine moving, while a joystick works well in situations requiring constant stage movements - such as cell counting. A 24.1 type wide screen LCD allows for the display of 4 different live signal images at the same time.



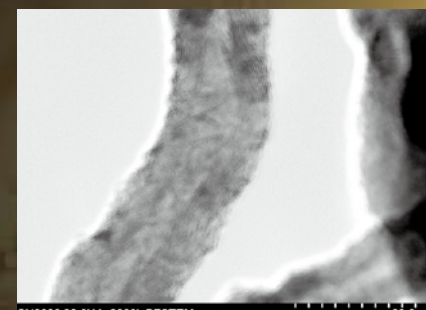
SU9000 1.0kV x500k SE
Sample : Gold on carbon 100nm



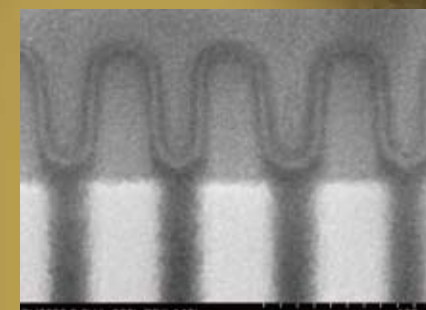
SU9000 3.0kV x800k SE
Sample : Hard disc 50.0nm



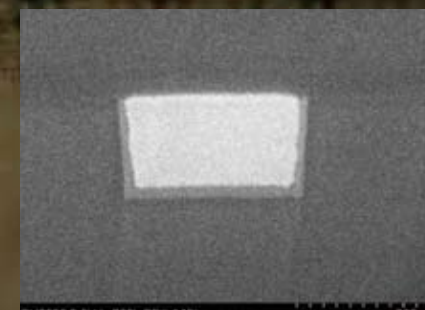
SU9000 3.0kV x300k SE(LA100)
Sample : Hard disc 100nm



SU9000 30.0kV x2000k BFSTEM
Sample : Carbon nanotube (STEM image) 20.0nm



SU9000 3.0kV x500k SE(LA10)
Sample : NAND flash memory (cross-section) 100nm



SU9000 0.5kV x200k SE(LA15)
Sample : Copper interconnection (cross-section) 200nm