# Equipment Configuration

# Hitachi CD SEM/S9380 II

Serial No.: 2194-039380

*date:* 07.03

1. SYSTEM INFORMATION

Workstation Model : HF-W2000 O/S :HPUX Software Version : 26.31

### 2. Specifications

#### 2.1 General Specifications

Wafer size	300 or 200mm wafers	
	SEMI or JEIDA standard orientation flat or V notch wafers	
Measurement method	Curser or line profile method	
Measurement range	50nm ~ 2µm	
Measurement repeatability	$\pm 1\%$ or 2nm (3 $\sigma$ ), use whichever value is larger (static value)	
Throughput	24 wafers/hour (Continuous measurement using recipes under Hitachi Standard Test Conditions)	
	Measurement points: 1/chip, 20 chips/wafer	
Secondary electron	2nm (Acceleration voltage: 0.8kV, 300kx, High-Reso. mode	
image resolution	Special specimen for Hitachi Resolution Measurement)	
Image magnification	1000 ~ 300kx	

### 2.2 Electron Optics System

Electron gun	Schottky emission type	
Accelerating voltage	300 ~ 1,600V (10V step variable)	
Lens system	Electromagnetic convergent lens system, booster objective lens	
Secondary electron detection method	Secondary electron and backscattered electron (option) switching detection method by scintillater/photomultiplier detector using the EXB filter	
Objective lens aperture	Heating type movable aperture (4 hole changeable from outside vacuum) with fine adjustment.	
Scanning method	2 stage electromagnetic method	
Astigmatism correction method	8 polar electromagnetic method (X and Y axis)	
Probe current monitor	Automatic measurement function with Faraday cup	
Optical microscope	1.2mm sq. view black/white CCD camera (0.6mm sq.: option)	

### 2.3 Stage

Movement range	X, Y: 0 ~ 300mm
Driving method	Pulse motor
Control/speed	Positioning control using a linear encoder Maximum speed: 200mm/s

#### 2.4 Loader

Transport from cassette to loader chamber	Automatic transfer using wafer transfer robot
Transport from loader chamber to stage	Automatic loading after automatic evacuation

### 2.5 Wafer Transfer Robot Method

> 2 cassettes (3 cassettes: option) random access method

Wafer detection inside cassette	Automatic detection using mapping sensor attached to FOUP opener
Chucking method	Vacuum chucking of wafer back
Orientation flat/V notch detection	Non-contact automatic detection method using optical sensor

### 2.6 Control and Display System

Observation control CRT	EWS 18" LCD	
	Display of SEM image and OM image; GUI operated screen display; Wafer map, Measurement value, Stage coordinates, and etc.	
Scan mode	TV scan, Slow scan	
Image processing	(a) Software process using filtering (Standard function)	
	(b) Hardware process using DSP (Option)	
Recording	(a) Video printer output function (Option)	
	(b) Image filing function (Option)	
Safety device	Mushroom type EMO Switch	

### 2.7 Measurement Data Processing System

File storing function	Various setting conditions, file save function for measurement results	
Recording media	Hard disk with EWS, Hard disk capacity: 18GB	
	3.5 inch magnetic optical disk	
	3.5 inch floppy disk	
Data process function	Statistical calculation output function using worksheet method	
	Real-time measurement value graph output function	
Print output	80 digit thermal printer	

### 2.8 Evacuation System

Method	All automatic dry cleaning evacuation system	
Vacuum pumps	lon pump: 3 ea.	
	Turbo molecular pump: 3 ea.	
	Roughing pump: 2 ea. (Option)	
Safety devices	Protection function for power failure, vacuum deterioration for main unit, decreased dry air pressure, and decreased cooling water flow.	

### 2.9 Size

Main unit	1200 (W) x 2007 (D) x 1900 (H) mm	1850kg
Mini environment wafer transfer system (2FOUP)	1200(W) x 1200 (D) x 1900 (H) mm	600kg
Mini environment wafer transfer system (3FOUP)	1700(W) x 1250 (D) x 1900 (H) mm	730kg
Display unit	600 (W) x 1496 (D) x 1850 (H) mm	340kg
Power supply unit	535 (W) x 1170 (D) x 1800 (H) mm	380kg
Cooling water circulation tank	406 (W) x 485 (D) x 880 (H) mm	56kg
	(W-5010T made by Hitachi Science Co. Ltd.)	

## 2.10 Utility

Power	Single phase 200/208/230V AC (50/60 Hz), 6kVA (100V AC: Option)	
Grounding	$100\Omega$ or less (Single)	
Nitrogen	500 ~ 680kPa [Gauge pressure] (for leaks)	
	Connecting pipe outer diameter is 6mm.	
Dry air	600 ~ 880kPa [Gauge pressure] (for valve motor)	
	Connecting pipe outer diameter is 6mm.	
Vacuum	-80Pa or less [Gauge pressure] (for mini-environment)	
	Connecting pipe outer diameter is 8mm.	
Circulation cooling water	98.1 ~ 196kPa [Absolute pressure] (for cooling lens column)	
	Connecting pipe outer diameter is 15mm.	

### 2.11 Environmental Conditions

Magnetic field	Power synchronous component (AC magnetic field): 0.3µT or less		
	Power asynchronous component (DC magnetic field): 0.1µT or less		
Vibration	Horizontal Direction 1Hz:	Vertical Direction	
	3µm P-P or less	1Hz: 20µm P-P or	
	2Hz: 1.3μm P-P or	less 2Hz: 8μm P-P or	
	less 3Hz: 0.7µm P-	less 3Hz: 3.4µm P-P	
	P or less 3.5Hz: 0.6μm	or less 4Hz: 1.3µm	
	P-P or less 4Hz:	P-P or less 5Hz:	
	0.7µm P-P or less	0.9µm P-P or less 6Hz:	
	5Hz: 0.75µm P-P or less	0.9µm P-P or less	
	6Hz: 0.9µm P-P or less	6.5Hz: 0.8μm P-P or less	
	7Hz: 0.9µm P-P or less	7Hz: 1.1µm P-P or less	
	8Hz: 1µm P-P or less	8Hz: 1.4µm P-P or less	
Noise	75dB (C characteristic) or less	·	
Room temperature	$20 \sim 25^{\circ}C \ (\Delta t = \pm 2^{\circ}C)$		
Humidity	60% or less		

#### 2.12 Layout

The standard S-9380 installation layout is shown in 2-FOUP



S-9380 Standard Layout (with 2 FOUP mini-environment transfer system)

### 3. Information



## 4. Working condition Image





5. Equipments Information(etc)

