

JEOL Scanning electron microscope JSM-5410LV, Ulvac pump brand, Eyela cooling circulator, Oxford EDS, JEOL SemAfore Software, Software for control and evaluation License, Sputter coater.



manufacturer: JEOL (SEM)
model: JSM - 5410LV

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DESCRIPTION, SPECIFICATIONS AND INSTALLATION REQUIREMENTS

The JSM-5410LV Scanning Microscope can be used for observation of the entire Area of large sized specimens up to 5-inch in diameter by rotating them. The whole series of operation including vacuum evacuation, image observation, focusing, and photographing have been automated. Moreover, provision of digitally processed still image allows very easy observation of images even in a bright room, making the JSM-5410LV outstanding in operability.

Another feature of the JSM-5410LV is that an energy dispersive X-ray spectrometer (EDS) and a wavelength dispersive X-ray spectrometer (WDS) can be attached to the specimen chamber at the same time. The JSM-5410LV+EDS a-high performance multipurpose scanning electron microscope capable of extending its utility from morphological observation to elemental analysis.

JEOL SEM 5410LV SPECIFICATIONS

Performance

Resolution :	3.5 nm (at 30 kV, WD = 8 mm), SEI (secondary electron image) mode
Magnification:	x15 (WD = 48 um) to 200,000 (25 steps) Digital indication
Image modes:	Secondary electron image (SEI) HV Mode Backscattered electron image (BEI) HV Mode Backscattered electron image (BEI) LV Mode

EOS (electron optical system)

Accelerating voltage (Acc.V.):	0.5 to 30 kV 0.5 to 3 kV, 0.1 kV/step (26 steps) 5 to 30 kV, 5 kV/step (6 steps) Hysteresis elimination function is linked for Acc.V. change
Electron gun filament:	Precentered W hairpin filament (K-Type) Hinge type gun open/close mechanism
Filament monitor	Built-in
Gun bias	
AUTO mode:	Automatic selection of the following 2 ranges: For high Acc.V. (2.1 to 30 kV) For low Acc.V. (0.3 to 2 kV)
MAN mode:	Continuously variable manually
Alignment:	Electromagnetic deflection type
Lens system:	3-stage Zoom condenser lens (CL): 2-stage Objective lens (OL): single-stage
OL aperture	Variable type (3-step) Fine position adjustable
Focus wobbler:	Built-in (usable in TV mode)
Focusing:	Push-Button and knob type Manual, and automatic focusing device (AFD) built-in Automatic focus tracer (AFT) built-in.
Stigmator:	8-pole electromagnetic type Manual, and automatic astigmatism correction device (ASD) built-in Stigmator memory built-in
Specimen tilt correction:	0 to approx. 90° correctable Dynamic Focusing Device(DFU) built-in
Scanning coil:	2-stage electromagnetic deflection type
Magnification control:	Automatic magnification corrector (MAC) built-in
Viewing field fine shift:	Electromagnetic type ±10µm (at 30 kV, WD 20 mm) in all directions by JOYSTICK control
Probe current range :	10 ⁻¹² to 10 ⁻⁶ A

Specimen Stage

Type	Eucentric goniometer
Specimen movements	
X direction shift:	80 mm
Y direction shift:	40 mm
Tilt:	-10 to +90°
Rotation	360° (endless).
Working distance (WD):	8 to 48 mm continuously variable Digital indication an LCD by Z sensor
Working distance (EDS):	20 mm. ±1mm.variable
Specimen size:	10 mm dia. x 5 mmh, 10 mm dia. x 10 mmh 32 mm dia. x 5 mmh, 32 mm dia. x 10 mmh 51 mm dia. x 5 mmh, 51 mm dia. x 10 mmh 72 mm dia. x 5 mmh, 76 mm dia. X10 mmh

Specimen exchange: Draw-out type
Slide type mechanism for loading/unloading of specimens

Detectors

SE/BE detector Consists of a collector, scintillator, light Guide and a photomultiplier tube

Scanning System

Scanning modes: PIC (frame scan)
TV (frame scan)
LSP (line scan)

Scanning speed
For observation: 0.27, 0.58, 2.88, 9.6 s/frame, TV scan
(TV scan for SEI only)

For photographing: 50 Hz: > on LCD ... 28.8 s/frame
>> on LCD ... 86.4 s/frame
60 Hz: > on LCD 24 s/frame
>> on LCD ... 72 s/frame

Display System

Magnification display: x15 to 200,000
(On LCD, and CRT in PIC1 mode only)

Observation CRT: 2 , 9-inch CRT

Frame size: 135 x 18G mm (TV mode)

Image quality control

Manual control: Rapid exposure system (display on CRT)

Auto control: Automatic contrast and brightness control
(ACB) built-in

Observation condition display

Upper line on LCD : Accelerating voltage
Magnification
Working distance
Film number
ACB linkage indication (A; ON/OFF)
Photo speed (>or >>)

Lower line on LCD : Evacuation sequence
Warning/Photo monitor/Check data

Observation CRT: Digital display in the PIC1 mode only
Accelerating voltage
Magnification (ON/OFF)
Micron marker with value
Film number

Photo Recording System

Exposure meter: Rapid exposure system (displayed on CRT)

Shutter: Automatic shutter built-in

Photo monitor Digital indication on LCD

Data recording

Data display: ON/OFF selectable (on CRT and Photograph)

Image on character

Base: ON/OFF selectable

Data contents: Accelerating voltage

Magnification

Micron marker with value

Film number (4-digit: manual set, and 2-digit: manual/auto set)

Data display modes All data ON
Magnification OFF
Micron marker (with value) ON only

Camara for scanning image(option): Manual and automatic shutters built-In
MP-35040: For instant pack film (0.75)
Recording CRT: One, 9-inch CRT

Image Frame Store System

Memory capacity
Number of pixels: 512 x 512 (512 x 480 for image)
Number of gray
Scale steps: 256
Number of frames One (Video graphic printer with 4-frame expand functions optionally available)
Still image display CRT One, 9-inch CRT (EIA, interlace scan type)
Frame size: Approx. 128 x 166 mm

Vacuum System

Control: Fully automatic sequence control •
(electro magnetic valves used)
Evacuation sequence is indicated on LCD
Ultimate pressure: Approx. 7×10^{-4} Pa (5×10^{-6} Torr)
Evacuation time: Approx. 2.5 min
Vacuum pumps: One, 420 lit./s oil diffusion pump with water cooling baffle
One, 100 lit./min oil rotary pump (RP)
Vacuum gauge One, Pirani gauge
Pressure is indicated as a % on LCD.
Checkers and Safety Devices •
Checkers
Auto checkers: 5 warning indication on LCD
Manual checkers: 8-item indication on LCD (including 2 items
For optional devices)
Safety devices: Protective devices are built-in for power and
Water failures, and pressure increase.

Others

Ports for X-ray
Measurement: for optional for EDS (energy dispersive X-ray spectrometer)
TV output terminals : Two BNC-R connectors (75 ohms)
(For TV mode and still image)
TV output signal: TV mode; EIA or CCIR •
Still image; EIA
Composite, positive polarity
1 Vp-p, H = 15.75 kHz, V = 60 Hz
Service outlet: One, 100 V AC, 2 A

Installation Requirements

Power Supply and Cooling Water
Power supply: Single-phase 220 V($\pm 10\%$) AC, 50/60 Hz, 5 kVA
(voltage drop at 5 kVA should be within 3%).
Grounding terminal One, 100 ohms or less.
Cooling water
Faucet: One, 10 to 12 mm O.D.
Drain: One, 25 mm I.D. or more

Flow rate: 2 lit./min.
 Pressure: 0.05 to 0.2 kPa.
 Temperature: 20±5°C.
 (At SEM's water outlet should be 35°C or less.)

Environment

Temperature: 20±5°C.
 Humidity: 60% or less.
 Stray magnetic field : 0.3µT or less.
 Floor vibration: 2 µm or less at 5 Hz (in X, Y and Z directions).
 Floor space: 2,500(W) x 2,300(D) x 1,800(H) mm or more.

Dimensions and Weight

Unit: mm & kg

	Width	Depth	Height	Weight	Remarks
SEM Column console	750	900	1,485	152	JEOL JAPAN
SEM Operation console	750	950	1,220	183	JEOL JAPAN
EDS + SemAfore PC Set	600	1800	740	40	OXFORD, JEOL
Cooling Water	350	380	900	20	EYELA JAPAN
Step down transformer JP.	320	400	680	65	220v to 100 volt.
Sputter Coater UK.	360	450	380	15	FISON UK.

Installation Layout



Unit: mm

Note 1: Fig. 1 shows a typical installation layout for the JSM-5410LV Scanning Microscope with an optional as EDS (energy dispersive X-ray spectrometer)

Be sure to maintain service areas at the left and rear sides of the microscope even if only a small layout space is available.

Note 2: Install the microscope well apart from facilities producing vibrations or electromagnetic waves (such as roads, husky passages, railroads, elevators, air conditioners and their air outlets, transmission lines, etc.).

Note 3: This microscope does not require any blackout curtain.

JEOL JSM-5410LV SEM & OXFORD EDS Customer ref.

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14. SCG ปูนซีเมนต์
15. Siam Steel Cord
16. Etc. และอื่นๆ

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*สภาพเครื่องสมบูรณ์พร้อมใช้งาน

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