

SEM JSM 5800 Quick Operating Instruction Manual

STARTING position

Control unit:

- Buttons "X-Y", "TV2" and "TONE" should be turned "ON".
- Button "L" is turned "ON" (yellow).
- Both screens are dimmed.

INSERTING the SAMPLE

1. Use the **standard procedure** for sample preparation and put the sample into the holder. Align the sample surface with the edge of the holder.
2. Turn on the right screen: set the potentiometers for "BRIGHTNESS" and "CONTRAST" to a **central position**.
3. Click on the "STAGE" menu and **select** the proper "HOLDER" type .
4. Click on "EXCHANGE" position.
5. Press the button "VENT" (press it for at least for 2 sec) on the door of the microscope chamber and wait until the chamber is filled with air. (The VENT light stops blinking and you will hear a beep tone).
6. Open the chamber and mount the sample holder into the sledge inside the chamber.
7. Close the chamber and **press** the button "EVAC" (for 2 sec or more) to start pumping the system and wait for **10 to 20 min** until "HT READY" is showed on the display under the left screen.
8. **Turn on the vacuum gauge** and check the **vacuum level**. It should be in the range of $<5 \cdot 10^{-4}$ mbar. If it is OK then **turn off the vacuum gauge!!!**

SETTING the PARAMETERS

(You can set some of the parameters during the evacuation (EVAC) sequence)

1. Turn on the left screen: set the potentiometers for "BRIGHTNESS" and "CONTRAST" to a **central position**.
2. Click on the "MENU", select "SETUP" and in "DATA PRINT" window click on "magnification", "accelerating voltage" (kV) and "marker".
3. Set the accelerating voltage in "ACCV" window to **20 kV** (usually already selected)
4. Select "SEI" (Secondary Electron Image) in the "IMS" window.
5. Click on the "STAGE" menu and select "INIT" position (this is central position) or the position where is the sample.
6. Select the **aperture size**. It depends on the type of the analysis that you will use No. 3 (110 um) or No. 2 (30 um).
7. Press the button "SPOT SIZE" and set it on ">>>>>>>>(9>".
8. Press the button "TONE".

9. If the sign "**HT READY**" is shown on the display under the left screen and the vacuum is $<5 \cdot 10^{-4}$ mbar then the **microscope is ready** and you can start with your work.
10. Now you can change the working distance "**WD**".
Press F1 → Stage Zxx (mm) → Enter (**xx always > 10 mm!!!**).

GETTING an IMAGE

1. **Reduce** the "**MAGNIFICATION**" to **minimum**.
2. Press the "**COARSE FOCUS**" button (the green light is on).
3. Press "**HT**" button (the red light is on).
4. **Slowly** move the "filament potentiometer" into the **saturation position** which is already defined and written down on the list of paper.
5. You will get a picture on the left screen (it can be too light, too dark or too diffuse!!!).
6. Press the "**TONE**" button and the microscope will automatically set the level of brightness (B) and contrast (C).
7. For more accurate setting of B and C **press** the "**TV2**" button and **set** the B and C to the center position (position +). When you finish press "**TV2**" again.
8. Use "**COARSE**" **focus knob** to sharpen (focus) the image (you can zoom in and zoom out during coarse focus) then turn off coarse focus and use "**FINE**" **focus knob** to get final image.
9. Move the sample with joystick (in x and y direction) and choose the region you are interested in.
10. You can change and control the image focus with "**FOCUS**" knob.
11. Press "**SL1**", "**SL2**" or "**SL3**" mode to get better image.

IMPORTANT!!! DO NOT perform any sample movement(x, y, z, R, T) using the joystick together with simultaneous change of the "FOCUS" or "MAGNIFICATION" → **change the magnification and focus after the sample movement is stopped!**

IMAGE CAPTURE with the ORION system

1. **Activate** the "ORION program" on the computer.
2. Select the image quality "Photo 1" or "Photo 2".
3. **Adjust the image** (sharpness, contrast, brightness, magnification,...) and press the button "**SL2**".
4. Activate the image acquisition process in the Orion program
5. The image capturing starts. Wait until the end and save the image in your personal folder.

Using the EDS

1. Set the working distance **WD10 mm** (if the sample is aligned with the edge of the holder, then the z = 10 mm).
2. Accelerating voltage is **20 kV**.
3. Commonly use the No. 3 **aperture** (110 μm)
4. Set the current (spot size) from **9 to 10 >** (for suitable X-ray signal).

5. Use instruction you got at workshop.

CLOSING the WORK

1. **Reduce** the “**MAGNIFICATION**” to a **minimum** and set IMS to the **SEI mode**.
2. Slowly move the “**filament potentiometer**” to **minimum** and switch off “**HT**” button.
3. Click on the “**MENU**”, select “**SETUP**” and in “**DATA PRINT**” window delete all the labels (“**magnification**”, “**accelerating voltage**” (kV) and “**marker**”) and set the left screen potentiometers (B, C) to minimum (screen is dimmed).
4. Click on the “**STAGE**” menu and select and click the “**EXCHANGE**” position.
5. Put all settings to the “**STARTING position**”.
6. **Press** the “**VENT**” button and wait for beep. Open the chamber and take out the sample. Close the chamber and press the “**EVAC**” button.

Write down your session into the notebook “SEM JSM 5800”!

Report any problem in the comment section.