

## Operation manual for COXEM CX-200Plus

1. Turn on computer.
2. Turn on power of SEM from the front panel. You will hear the pump sound from mechanical pump and USB connection sound from desktop.



3. Run software Nano Station on desktop.
4. Vent chamber by pressing the vent button on the software. You will hear the pump stop working, venting will proceed in sequence.
5. **Be sure to wear gloves.** Check the pressure to be close to ambient pressure ( $\sim 360$  Torr) from the front panel of SEM, then open chamber and load samples on the center of the stage. This will allow you to quickly navigate to your sample. Orientation of sample on the stage is the same as shown on the software. Enter the sample height as 15 mm and enter, a window will pop out for confirmation, press yes. Close the chamber tightly (make sure no gap in between chamber doors)
6. Press Pump button on the software. Wait for the pressure drops to  $4.5 \times 10^{-5}$  Torr. You can view the chamber inside by press the camera button shown below.



Camera button

7. Press center button to move the stage to the center. Change Z coordinate as 30 mm, press enter, Z value will change to  $30 + 15$  mm = 45 mm. Never let your sample collide with the detector by monitoring the distance on the screen through the camera view.



Center button

8. Turn on electron beam gun. Zoom out to find your sample and then zoom in and focus on some features. Adjust focus, brightness, contrast by hovering the mouse over the corresponding slider and scrolling mouse. To take pictures, click on Photo button, scanning image will be displayed, then click on image, scanned image will be saved to folder.
9. Turn off E-gun. Wait for 5 mins and then vent.
10. Wait for pressure close to ambient pressure, open chamber and take out samples. Close the chamber tightly.
11. Press Pump button, wait for pressure drops below  $10^{-4}$  Torr, turn off the power of SEM. Close software, take your data, and fill your name, date, time in and time out on logbook.

Learning materials:

[1] [https://drive.google.com/drive/folders/1B6il6iW5W\\_bzgkwua1oW152WmcPLU7Qb?usp=sharing](https://drive.google.com/drive/folders/1B6il6iW5W_bzgkwua1oW152WmcPLU7Qb?usp=sharing)