

**ABM's High Resolution Mask Aligner** is a very versatile instrument with interchangeable light filters which allow Near-UV (405-365 nm) as well as Mid- and Deep-UV (254 nm, 220 nm) exposures in proximity (non-contact) or contact (soft & hard) modes. The exposure can cover an area 200mm in diameter. The bottom-mount mask system accommodates masks up to 9 inches square and substrates from small chips to wafers up to 200mm. The alignment tooling system also features an air-bearing substrate-to-mask planarization system for wedge-error compensation. The printing resolution is 0.8  $\mu\text{m}$  for Near-UV and 0.4  $\mu\text{m}$  for Mid-UV and Deep-UV in vacuum contact mode.

**Features:**

Proximity, soft contact, and vacuum contact modes

Substrates of any size or shape up to 200mm diameter and 0.250 inch thick

UV, Mid-UV, and DUV exposure modes

Dual CCD Zoom Microscope alignment system, 90X to 600X

Bottom-mounting mask holders

Operation of the ABM is performed manually using the front panel switches. In general, mechanical operations are controlled by vacuum toggle switches, and electrical operations are controlled by push button switches. Controls are interlocked to prevent unsafe operational modes.



## OPERATION:



1. Turn on Power Switch
2. **ONLY** if using **Vacuum Contact** mode **with gasket installed**: turn on Nitrogen Flow switch, adjust flow to 4-5
3. Turn on Raise Mask Frame switch
4. Mount mask to bottom of Frame and press Mask Vacuum switch on
5. Mount wafer onto Substrate Chuck and turn on Substrate Vacuum switch
6. Lower Mask Holder
7. Press and hold Chuck Leveling button while turning Chuck Motion knob CCW using **ONLY** the **TOP** part of the knob
8. When knob begins slipping, stop turning and release Chuck Leveling switch
9. For alignment, turn Chuck Motion knob CW **at least** one full turn
10. Move Alignment System switch to Align
11. Perform alignment using X, Y, and Theta knobs
12. Turn Chuck Motion knob CCW until back in contact (no Chuck Leveling)
13. For **Vacuum Contact** mode **ONLY**: if using Vacuum Contact mode **with gasket**, turn off Substrate Vacuum switch, turn on Contact Vacuum switch
14. Move Alignment System switch to Home



15. Set Exposure Timer
16. Move Light Source switch to Expose
17. After exposure is completed, move Light Source switch to Home
18. **ONLY** if using **Vacuum Contact** mode **with gasket**: turn off Contact Vacuum switch, turn on Substrate Vacuum switch
19. Turn Chuck Motion knob CW until there is a gap between mask and substrate
20. Turn on Raise Mask Frame switch
21. Turn off Substrate Vacuum switch and remove wafer
22. Pull Mask Vacuum switch off and remove mask
23. Lower Mask Frame
23. Turn off Power switch (and Nitrogen Flow switch if using **Vacuum Contact**)

## Changing Exposure Wavelength Mirror



The ABM exposure housing has interchangeable turning mirrors for various exposure wavelengths. The standard mirror allows 405-365nm light to be used. Other available mirrors allow 254nm or 220nm light to be used.

**NOTE: You MUST be trained to perform this procedure!**

### **To change the exposure mirror:**

1. Remove the thumbscrews from the top of the front exposure housing.
2. Remove the panel from the housing and set it aside
3. Turn the retaining knob 180° while pulling away from mirror
4. Using the mirror tool, carefully slide the mirror towards you until the far edge clears the clip
5. Tilt the mirror away from the holder and lift it out
6. Remove the mirror and place it in the mirror box
7. Select a mirror from the box and reverse the steps

Make sure that the mirror is installed with the **label** facing **AWAY** from the light source. The mirrors are **front surface** mirrors and will not work properly if reversed. Be careful not to touch the mirror surface. If you see smudges on the mirror, **DO NOT** attempt to clean it. Notify Staff and wait for them to assess the mirror condition.

## Alignment System:



The alignment system utilizes two microscopic zoom lenses with magnification from 90X to 600X. CCD cameras with electronic apertures are used for imaging and are viewed on video monitors. The microscopes are independently adjustable for position, zoom level, focus, and illumination.

**DO NOT** adjust the illumination lamp power supply or the video monitors. Use the aperture controls on the CCD cameras to change image brightness.

The microscope can be made to move along one axis at a time using the vacuum release buttons on the handle: either X, Y, or both at once.

The left and right objectives can be individually adjusted for X-axis position using large knobs on each side of the assembly. Minimum separation of the microscopes is around 50mm, or 2 inches. For smaller substrates, scan back and forth in X or Y using a single microscope.

Each side has an adjustable zoom lens. As magnification is increased, you will need to open the aperture further to keep the image bright. Lower numbers allow more light to reach the CCD camera.