

Check List for Proper Use

1. Check that the gas regulator, pump, RF Generator, and the DC Power Supply are off.
Vent the Chamber.
2. Remove all bolts from top lid. Lift the lid and lock in the gas spring on the side to insure it will not close unexpectedly. Winch down the strap until it is tight but not pulling the lid up. The weight should be on the gas spring.
3. Place dirty optic in the vacuum chamber on glass platform below antenna.
4. Ensure the metal grating is attached to the Lexan top.
5. Release the gas spring and safety strap and lower the lid.
6. Ensure that all flanges are tightened down and sealed properly.
7. Insert the bolts into the lid and tighten down.
8. Turn on the roughing pump and close the venting valve and then open the valve to the chamber.
9. Watching the gauge, make sure that the chamber is not leaking or increasing in pressure. If either situation occurs, safely vent the chamber using the release valve and turn off the pump.
10. Confirm that the top is firmly secured, all shielding is in its proper place and the interlock switch is depressed by the lid.
11. Turn on the DC power supplies to the amplifiers. 12 Volts is the suggested voltage for all the amplifiers. The two smaller amps will draw about 0.13 amps together. The big amplifier will draw between 2 and 3 amps.
12. Turn on the RF generator to roughly 140 MHz with the attenuator turned all the way down. Adjust the RF generator using the watt meter as a guide to maximize power output by slowly turning up the attenuator while also narrowing in on the best frequency. The range the amplifier works at is 135 MHz to 150 MHz, so find a frequency in that range that works with the antenna. To see the reflected power you rotate the element in the watt meter 180 degrees counter clockwise so the arrow is pointing at the amps and it will typically show about 50% of the forward power being reflected.

13. When the chamber has reached around 50 millitorr. Open the gas tank regulator keep it below 25 psi or the over pressure valve will open up. Then adjust the needle valve till the chamber pressure reaches roughly 100 millitorr.
14. Look through the lid ensure that a pink plasma has been generated
15. Look through the lid to check on the optic to do a visual inspection of cleanliness.
16. Once clean, turn off the gas at the tank regulator and check that the pressure is decreasing
17. Turn off the RF Generator and the DC Power supply to the amplifier
18. Turn off the roughing pump once the pressure from the gas has been removed.
19. Vent the chamber.
20. Lift the chamber lid, engage the gas spring, and winch down the safety strap.
21. Safely remove the optic

Helpful Tips

- It can be hard to light the plasma at too high or low pressures. Typically, between 2 torr and 100 mtorr you should see something.
- Once lit it can stay lit below 50 mtorr
- The frequency generator isn't great and will require adjustment because it will drift from what you set it at.
- The lid will pop. That is normal
- If the chamber is leaking, check the hinge on the back and loosen the bolts holding the hinge to the aluminum.
- If the chamber is still leaking, then get a new gasket for the lid
- Put the bolts for the lid in the four corners of the lid. If you need more, they are in the MEC cabinet by the bathroom in the box labeled Plasma Cleaner 2018
- It will take about an hour to clean very contaminated optics
- If you need more power to the antenna in the future buy an antenna tuner for the range 130MHz to 150MHz and when tuned correctly you will see much less reflected power.