

Mprobe Restart After Vacuum Loss

- 1) Turn off electronics, (2505 Memory Interface, Spectrometer Power Supply, Glassman High voltage, Service Physics X-Ray Gun Controller, nti sputter gun controller)
- 2) Turn off alarm on interlock box near bottom of rack and set all three bypass switches on box up.
- 3) Push reset button on interlock box
- 4) Press reset on back of control box over XPS
- 5) If the Neslab circulator is off Restart it.
- 6) Check that the transfer arm is full withdrawn.
- 7) **If the Cryo's are up to a temperature >25 C or the pressure is higher then 1×10^{-7} Torr.**
 - a) Turn off cryo-pump compressor
 - b) If the Turbo pump is on turn it off and wait till it stops.
 - c) Turn on interlock override on control box.
 - d) Check gate valves to see that 0, 1, 2, 5, and 6 are open and 3 and 4 are closed
 - e) Turn on the turbo pump and wait till it is up to speed.
 - f) Wait till the vacuum is $< 1 \times 10^{-6}$ T, this will take 1 to 2 hours or more.
- 8) If the cryo compressor is off turn it on (you may need to turn the cryo switch off and then on).
- 9) Make sure that the cryo pump is working
- 10) After the cryo temperature is down below 25K (about 1 to 3 hours) close gate valves 1 and 5 (only 0, 2 and 5 are open).
- 11) On the interlock box set the alarm and three bypass switches to down (on)
- 12) Turn off interlock override.
- 13) Continue to next section.

Restarting M-Probe X-Ray Gun

1. Check vacuum system OK
2. Gates 0, 2, and 6 should be open with all others closed
3. Turn off interlock override if it is on
4. Make sure system power switch on the back is up
5. Turn on X-ray gun boxes (bottom two – Turn on Glassman high voltage and press HV on, and turn on 9603 X-ray gun spot size controller)
6. If the vacuum has gotten above 5×10^{-8} Torr or system was vented:
 - a. Turn "ramp" knob on spot size controller to slowest, fully clock wise (service switch down)
 - b. Press "start filament" followed by "HV on" and wait for it to read 2kV on the spot size controller box - watch pressure (Filament on LED should turn on, Xfer OK LED on, Panel meter should read I FIL mode and go to ~ 1.2 A)
 - c. Set the "service" switch UP, keeping "ramp" knob on slowest setting (c.w.) and changing "stand by" to "operate" (takes 8 h, watch pressure)
7. If the vacuum did not get above 5×10^{-8} Torr:
 - a. Turn "ramp" knob on spot size controller to fastest, counter clock wise (service switch down)
 - b. Press "start filament" followed by "HV on" and wait for it to read 2 KV on the spot size controller box - watch pressure
 - c. Set the "service" switch up and turn "ramp" knob to fastest, then press "operate" (takes 2 h, watch pressure)
8. Once 10kV reached, degas anode by starting X-ray gun on 100 micron spot and slowly **increasing the spot size until largest spot does not raise pressure above 2×10^{-8} Torr**
9. Turn off X-rays
10. Turn on spectrometer boxes (top 3, spectrometer power supply, flood gun, memory interface)
11. Open software, check "X-ray gun operate" in ESCA control panel
12. Switch spot size controller from "manual" to "computer"

13. Degas flood gun - check "Flood Gun" box in ESCA control panel and increase energy to 5 eV, watch pressure and wait for at least 1 hour
14. Turn down flood gun energy, uncheck flood gun box, and close ESCA control panel
15. Instrument is ready to use

XPS maintenance schedule Kratos and MProbe

Every week:

- Refill water on Affinity and Neslab circulators
- Check water level on Hawk chiller
- Check N2 level on HREELS and order new cylinders
- Replenish gloves, IPA, and KimWipe

Every 6 months:

- Change M-Probe pump oil (last 2013-06-10)
- Change M-Probe anode (3 3/8" Cu gasket, Al/Cu anode, 6 Au 1/8" screws PRT-6520-003) (last 2013-06-10)
- Change M-Probe Hawk chiller deionizer (Thermo Sci combined DEM/OXY cartridge D8809) and water filter (Hytrex cartridge filter PRT-6530-003) (last 2013-06-10)
- Change Kratos Affinity circulator filter (Pentek filtration polydepth filter cartridge PD-1-934) (last 2013-09-25)

Every 36 months (last 2013-02-17):

- Check and change Kratos deionizer cartridge (84-789), or when deionizer stays on
- Change house water filter

Every 60 months:

- Change tip seals on Kratos (last 2013-04-19) and EELS (last 2010-07-01) scroll pumps
- Change house air filter (Motor guard M-723 filter element) (last 2010-07-01)

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