Restart of MProbe For GLA's only

Mprobe Restart After Vacuum Loss

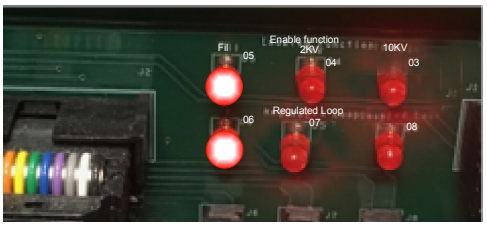
1) Turn off all electronics, (2505 Memory Interface, Spectrometer Power Supply, Glassman High voltage, Service Physics X-Ray Gun Controller, nti sputter gun controller)
2) Turn off alarm on interlock box near bottom of rack and set all three bypass switches on box **up**.
3) Push **reset** button on 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6) Check that the transfer arm is full withdrawn.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 >80 K or the pressure is higher then 1 x 10^{-7} Torr.**
   a) Turn **on** interlock override on control box.
   b) Turn **off** cryo-pump compressor
   c) If the Turbo pump is on
      i) Shut gate 2 and turn Turbo **off**.
      ii) Bring chambers up to atmosphere, Open gate 1, 5,namd 3, b
   d) Wait for the cryo's to warm up T(cryo) >270K (will take a few hours);
   e) Open gates to cryo 0 and 6.
   f) Shut Nitrogen, gate 3.
   g) Pump the system, Open gate 2, Turn **on** the turbo pump.
   h) Wait till the vacuum is < 1×10^{-6} T, this will take 1 tor 2 hours or more.
8) Turn **on** the cryos (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 (gates 0, 2, 5, and 6 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 that the vacuum system is OK
2) Gates 0, 2, and 6 should be open with all others closed
3) Turn **off** interlock override on back of control box over XPS.
4) Make sure the system power switch on the back is **up**
5) Turn **on** X-ray gun boxes
   a) Turn on Glassman high voltage and press HV on,
   b) Turn on 9603 X-ray gun spot size controller

c) Make sure the "**Interlock OK**" LED comes on otherwise you cannot get current from gun.

6) If the vacuum has gotten above **>1 x 10^{-7} Torr** or system was vented:
   a) Turn "ramp" knob on spot size controller to **slowest**, fully clock wise with the service switch **up.** Note that the switch in the up position runs the ramps below about 100 times **slower** than when it is in the **down** position.
   b) Press "**start filament**" on 9600 followed by "**HV on**" on Glassman It will go through 2 cycles of ramping voltages? If the pressure does not rise after 2 minutes you can flip the switch **down** and watch the pressure. If it increases flip the switch **up** and wait till the pressure goes down. You can repeat this till the ramps are complete,
      i) Ramp 1, I FIL:
         (1) The front panel "**Fil on**" LED should turn on and the Panel meter should read I FIL mode and goes from 0.6 to ~1.2 A.
         (2) Inside the 9600 X-Ray controller the "Fil" (05) LED should be on and LED 06 will come on



      ii) Ramp 2, V 2KV:
         (1) Meter V 2KV goes to 2.3 KV
         (2) LEDs 05 off, 06 off, 04 (2KV) on, 07 will come on
   c) Watch that the Pressure does not go up too much if it does flip the switch **up**.
   d) Set the "service" switch **UP**, keeping "ramp" knob on **slowest** setting (c.w.) and changing "stand by" to "**operate**" (Make sure the "**Interlock OK**" LED comes on otherwise you cannot get current from gun. It takes ~8 h, watch pressure) The Glassman should show 1 or 2 KV of high voltage but almost no current.

7) If the vacuum did not get above **<1 x 10^{-7} 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 for the filament and 2KV ramp to complet (see 6b above) This should take a few minutes.
   c) Watch the pressure if it increases significantly go to 6 above
   d) 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 x 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 08/2019)
  - Change M-Probe anode (3 3/8" Cu gasket, Al/Cu anode, 6 Au 1/8" screws PRT-6520-003) (last 08/2019)
  - Change M-Probe Hawk circulator deionizer (Thermo Sci combined DEM/OXY cartridge D8809) and water filter (Hytrex cartridge filter PRT-6530-003) (last 08/2019)
  - Change the water and air filters for the MProbe located in the overhead rack.(changed 08/2019)
  - Change the oil in the MProbe Fore pump.
  - 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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