MEC Be Lens Change Procedure

Document Approval (signature/date)

Name / Title	Signature	Date
MEC Be Lens Change		

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1   Purpose

The purpose of this document is to provide relevant information to cover the scope of work necessary to change the beryllium lenses inside the MEC hutch beamline.

2   Scope

To proceduarlize changing the Be lenses in MEC.

3   Responsibilities

| Kayla Pflueger	Controls the content of this document.

4   Procedure

1. In the MEC control room, or in the hutch, bring up the MEC home screen
    a. From the desktop of any computer, right click and select "open terminal"
    b. Once the command prompt has loaded type *mechome* and hit enter
2. Go to the vacuum screen for the hutch and observe the pressure in the lens chamber (outlined in red in the pictures above).

3. Click on the Vacuum button on the left and select 'MEC vacuum'
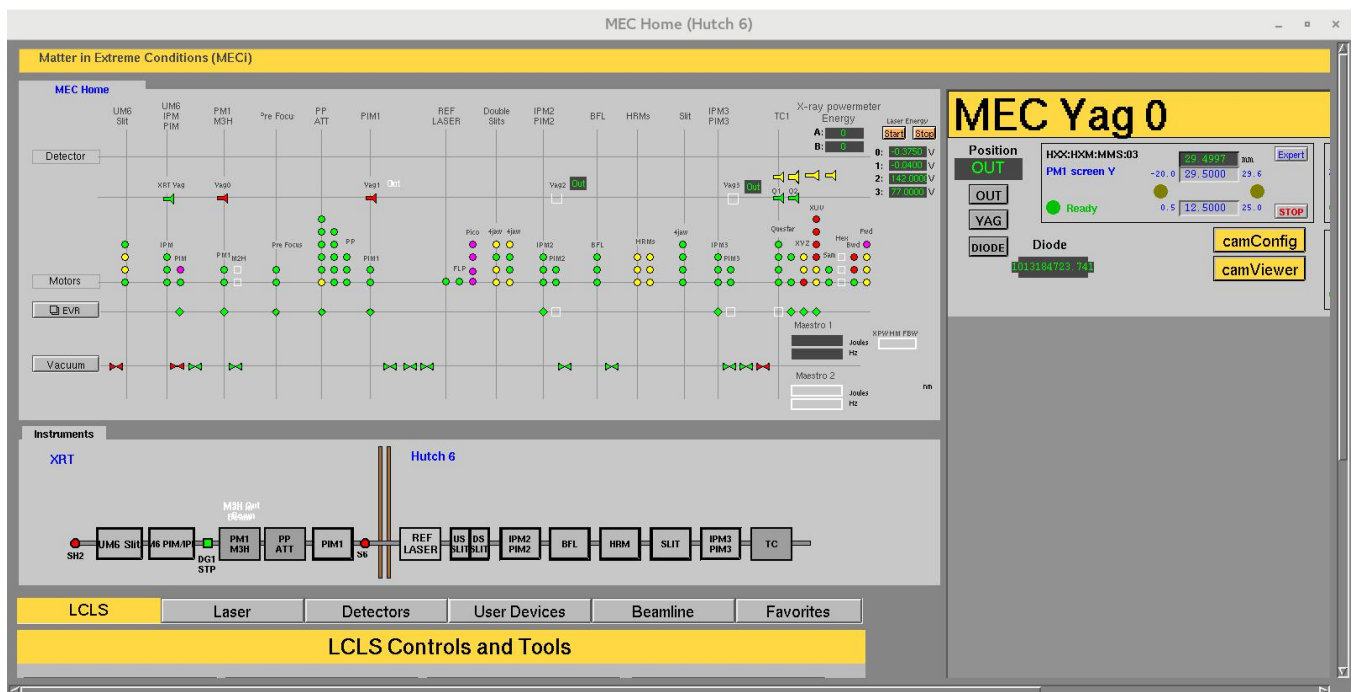
4.   On the right of the XT2 section, check the following beamline status:

    a.   MEC-XT2-VGC-02 gate valve is open (written on the gauge)

    b.   MEC-XT2-VGC-03 gate valve is open (written on gauge)

    c.   MEC:XT2:GCC:02:PMON reading should be below 5e-7 torr (hold mouse middle click button on the value to make sure the gauge is the right one)
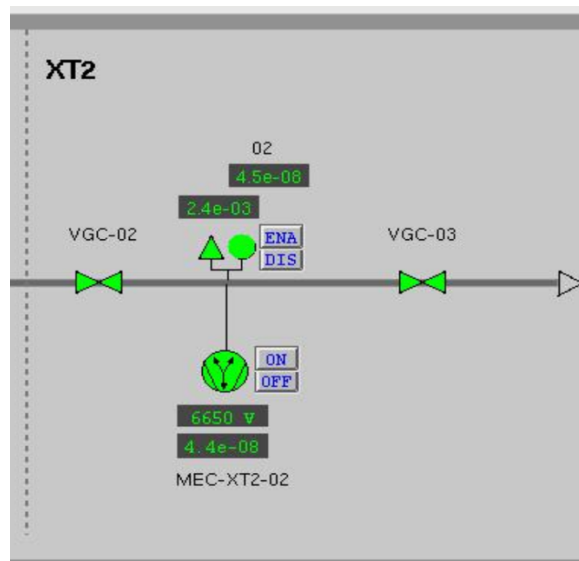
5.   Visually inspect that there is no obstructions under the Be lens tank pipes (before and after the tank and within the gate valve VGC-02 and VGC-03).

6.   Add a plastic foam supporting structure under the long below to make sure it doesn't bend too much.

7.   In mechome > Beamline > Beamline CRL (hutch), in the MEC:XT2:MMS:30 (Be lens Z), put absolute value of -4338mm to move the tank all the way back. This step is done while still in vacuum.
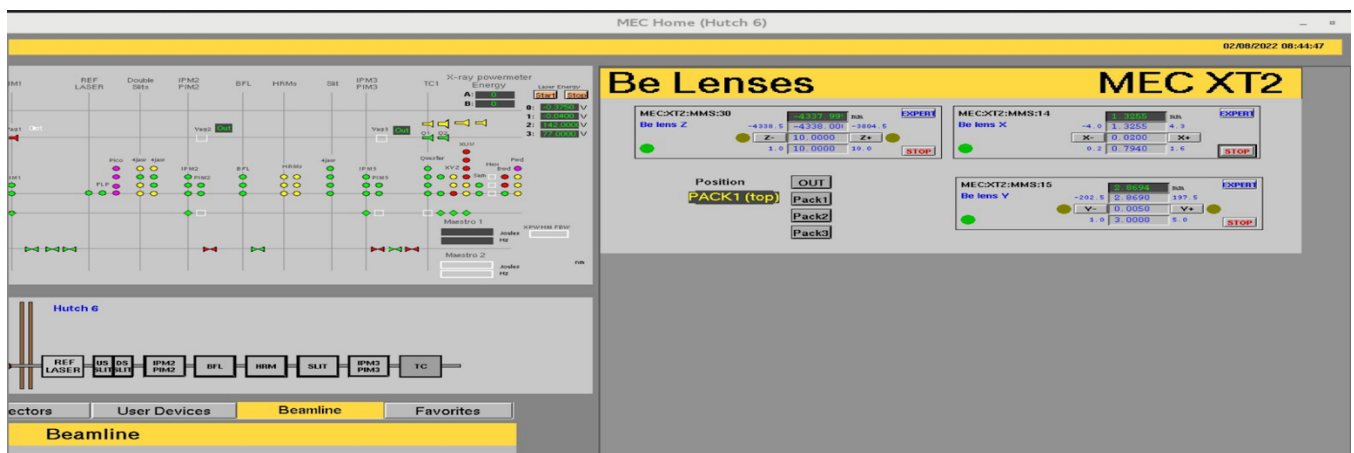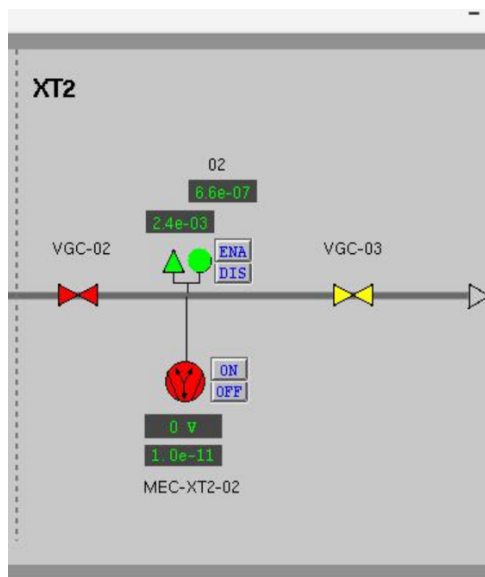
7. In mechome > Beamline > Beamline CRL (hutch), click on 'PACK1 (top)' and check that the readback value on MEC:XT2:MMS:15 (Be lens Y), is about 2 or 3 mm. This step is done while still in vacuum.
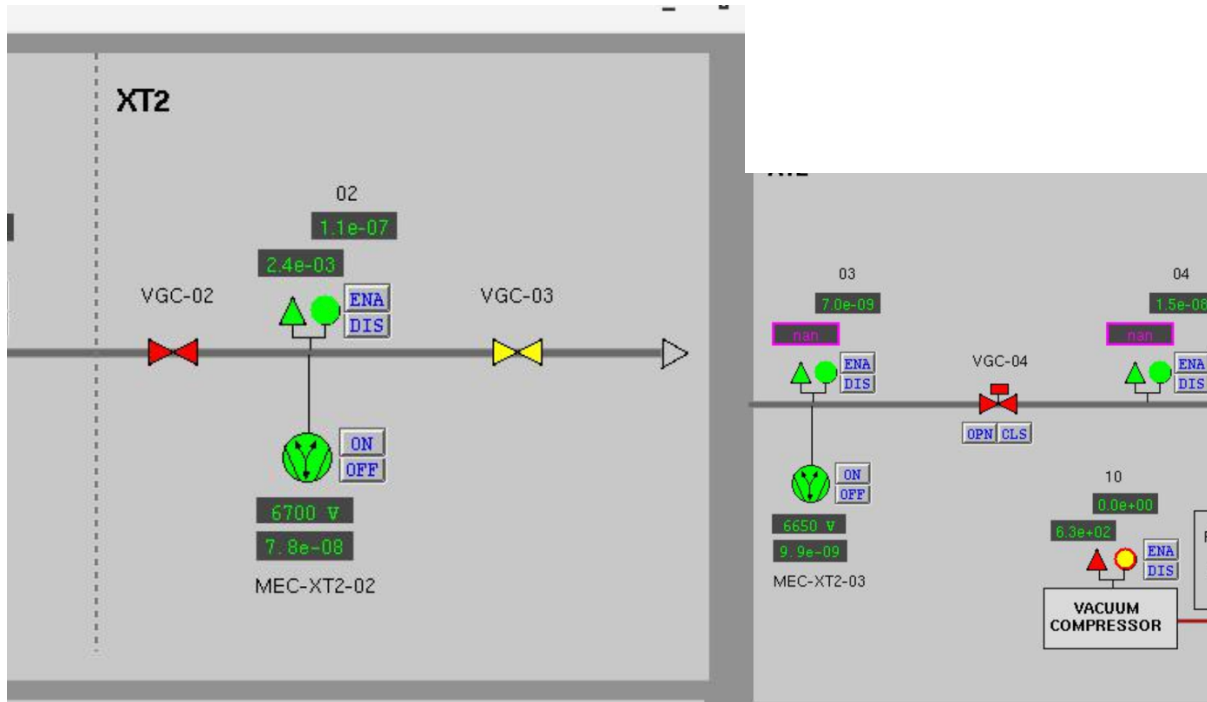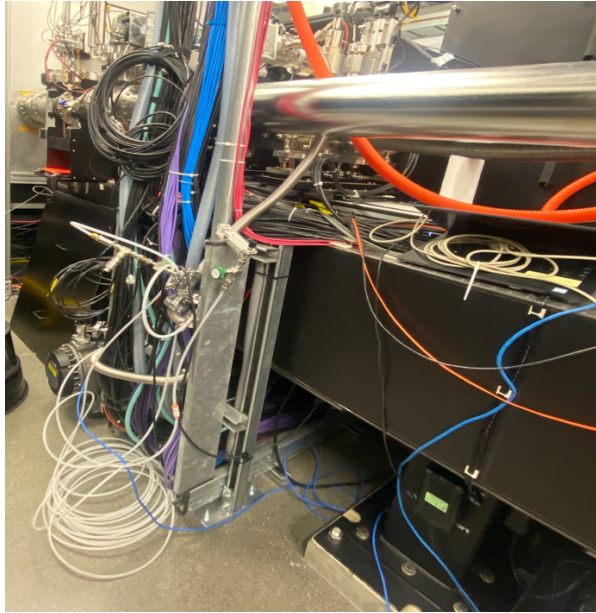

8. Manually close VGC-02 and VGC-03. It will close VGC-04 automatically. VGC-03 will look yellow, while VGC-02 will look red.
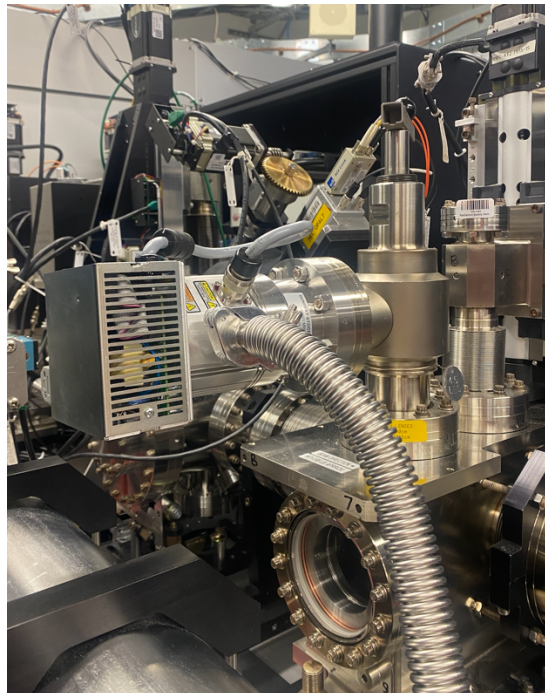
9. Turn off ion pump MEC-XT2-02

10.   Now that the section for the lens tank is closed, start venting it. This part has no monitoring and needs to be done **MANUALLY** at the venting line close to the tank (south of the beamline).


a.   Make sure the angle valve at the scroll is closed
b.   Make sure the angle valve at the tank is closed

c.   Start opening the needle valve for dry air and inject 2 unit of flow
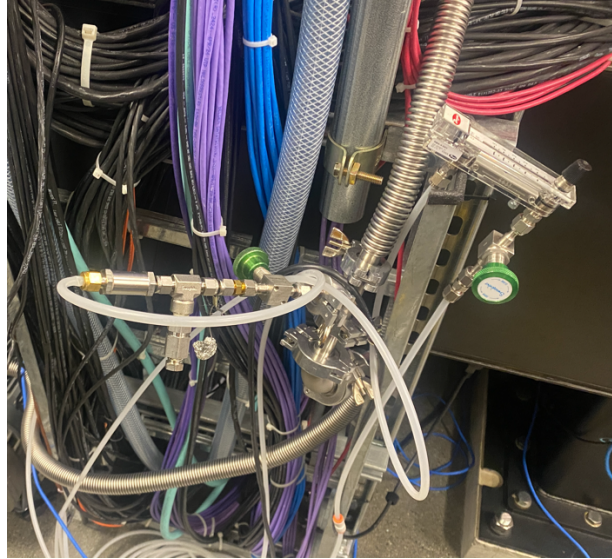

d.   Open the needle valve for injecting the air into the vacuum pipes between the scroll and the angle valve

e.   Once you hear air coming out of the release valve, or you see the pressure drops on the manual ball indicator, you can open the angle valve at the tank all the way. Watch for the pressure to go up, with the cold cathode turning off (yellow) and the pirani value goes up.

f.   Put the max flow on the manual flow ball valve

g.   Watch for the pressure to go up, it will take about 1.5h to reach atmospheric pressure at about >700 torr.

11.   Access from the north and south and open the Be lens tank via the viewports. Finger untighten the screw+nut lock on the north viewport, and open the south flange by unscrewing the bolts..
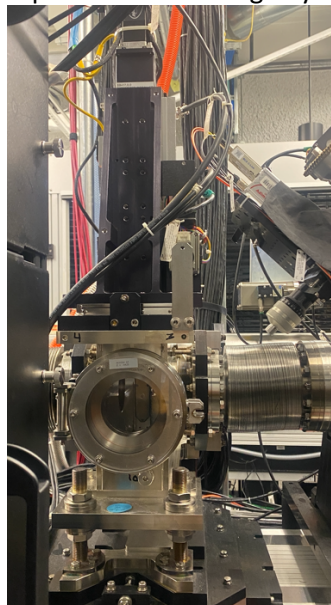
12.　　From the south side hold the Be lens cassette while someone from the north side use the Be lens torque screwdriver to release the Be lens cassette and remove cassette from the chamber.

13.　　Bring lens cassette to clean workspace and verify new Be lens recipe.

14.　　Perform Be lens chance according to new recipe and record new recipe in the lens tracker: https://docs.google.com/spreadsheets/d/1PgHBq5lFiNbtRGSTreYxzELsoz0T-8oFc-lSRuC0iQc/edit?usp=sharing

15.　　Finger tighten the screw+nuts after closing the north flange and close the south flange with new Cu gasket.

16.　　Close the N/dry air inflow at the south of the beamline. Verify the manual ball gate valve reads 0.
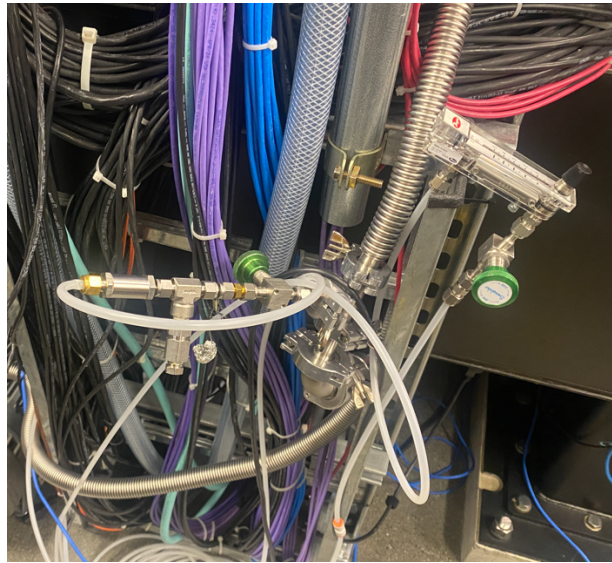

17.　　Plugin the scroll to the power strip. Slowly turn on the manual valve at the scroll to start pumping the Be tank through the turbo.
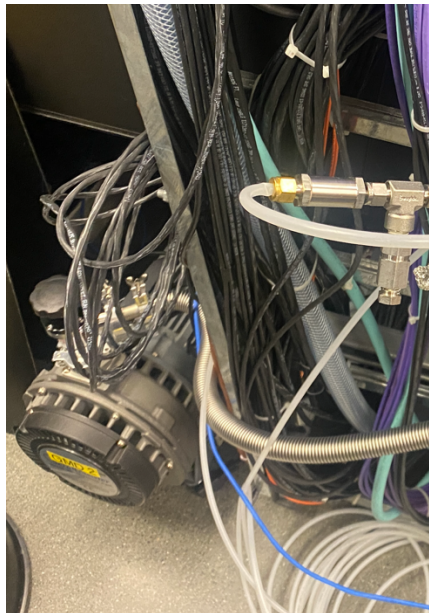
18.　　Reads the pressure on the GPI:02 and start the turbo once pressure reads below 10 torr.

19.　　Leave it pump down to reach below 1e-5 torr. It takes up to 4h.

20.   Once the pressure is below 1e-5, turn on the ion pump.

21.   When the pressure is below 1e-7, close the manual valve at the turbo and turn the turbo and the scroll pump off.
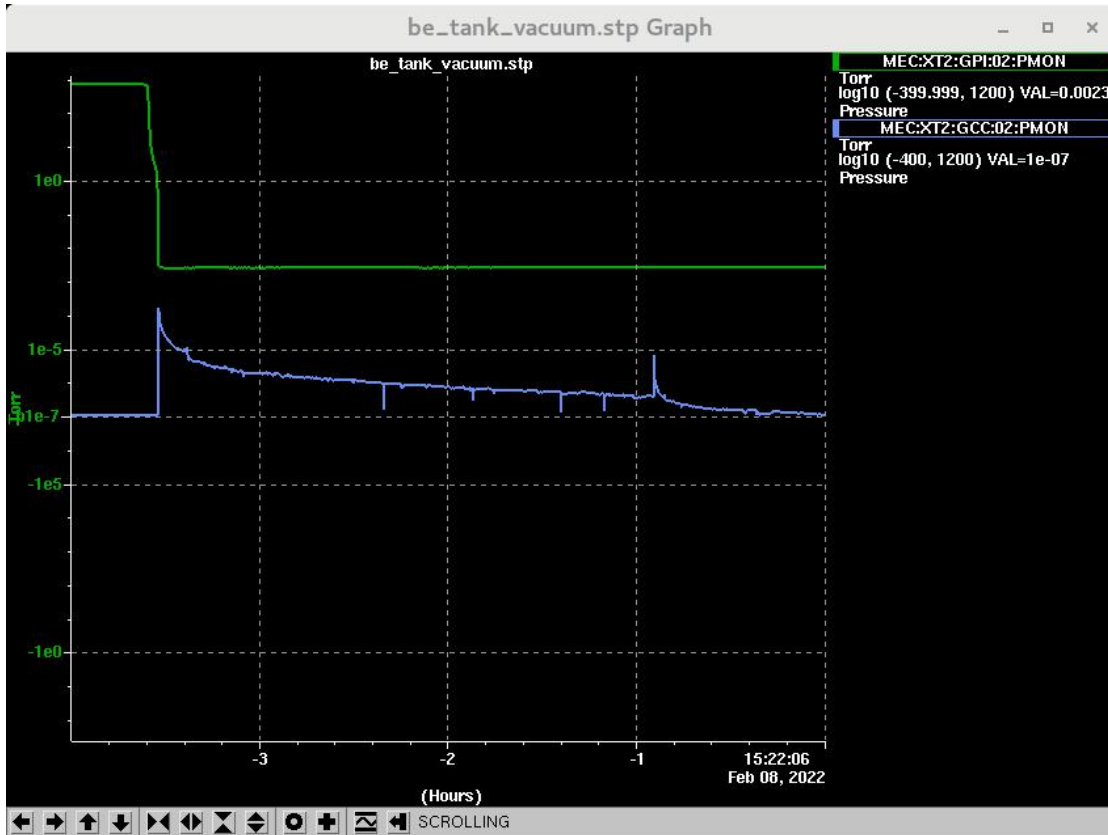
22.   Once the pressure is below 1e-7, open the manual gate valve VGC-02 and VGC-03.

23.   Remove any plastic supporting structure under the below.

24.   Update the lens tracker and the whiteboard in the MEC hutch (on the left when you enter the hutch).

25.   Update ServiceNow ticket.

5   Revision History

Revision	Date Released	Description of Change
R002		
R001		
R000	02/23/2022	Original Release.