

LBC CRYOSTAT PUMPING AND COOLING PROCEDURE

The following is a general procedure for the pumping and cooling of the LBC cryostats. The operation may take place with the cryostats in the lab or already mounted on the telescope. If the cryostats are on the telescope, a certified crane operator will be required to lift the pump to the proper position and the telescope will need to be locked out at horizon for the duration of the operation.

STARTING WITH THE CRYOSTATS WARM

1. Connect the pump line to the cryostat. The valve to the cryostat should be CLOSED.
 2. After a few seconds, before the pump reaches the regime speed (indicated by the green LED), OPEN the valve to the cryostat. This is to prevent the turbine on the pump from being “shocked”.
 3. Check the sensor to confirm the pressure is decreasing.
 4. When the vacuum reaches $5E-05$ mbar, start filling with LN2.
 5. After approximately five minutes, the outflow of vent gas should significantly decrease, indicating the cryostat vessel has reached thermal equilibrium. At this point the cryopump (“getter”) starts working. 10-30 seconds after this CLOSE the valve to the cryostat. NOTE: If the valve isn’t closed at this point, the vacuum may get worse due to the getter providing stronger pumping than the turbo.
 6. Turn off the pump and wait for it to stop, then disconnect.
- NOTE: when starting with the cryostats warm, it will be necessary to occasionally top off the LN2 until the internal components are completely cooled and the cryostat achieves it’s maximum hold time.

PUMPING WITH THE CRYOSTATS COLD

1. This should rarely be necessary, but if the vacuum needs to be refreshed it can be done.
2. Connect the pump, switch it on and wait for the green LED to come on.
3. OPEN the cryostat valve and confirm the pressure is decreasing.
4. Pump for 1-2 minutes only, then close the valve (to prevent the “bounce back” effect due to the getter pumping harder than the turbo).

GENERAL TIPS AND INFORMATION

Hold times are about 30 hours for Red and 50 hours for Blue.

Vacuum levels to be aware of (in mbar):

Cryostat status	good vacuum	acceptable	poor
Warm, not pumping	10E-02	10E-01	10E00
Warm, pumping	10E-05	10E-04	10E-03
Cold	10E-06	10E-05	10E-04

Anything above the “poor” level indicates a possible leak!