Refilling the 115/230 GHz cryostat

The following are basic steps that should always be performed in order to guarantee a successful helium transfer. These steps apply only to **re**filling the cryostat, i.e. if it has already been precooled. Always check the amount of helium left in the helium dewar in the bodega before and after refilling the IRAM cryostat. Write down the amount of helium before and after the fill in the table in the binder in the cryo bodega.

1. PARK the telescope and then, from the pedestal, put the telescope into STOW position.
2. When going to the cabin, first turn on the helium gas on the compressor platform by opening the main valve on the He 4 gas bottle.
3. In the cabin, attach the He 4 gas line (on the right side in the cabin) to the small nozzle on the helium dewar (it has a rubber tube on it, which you will have to remove first). **Note:** Before attaching the rubber hose flush it with He first.
4. Now open the top lid of the cross on the cryostat. Be careful not to drop the wing nut or the screw.
5. Verify that the entrance tube to the helium tank is not blocked. For this, use the stainless steel probe available in the cabin[1].
6. Introduce the transfer tube into the helium dewar first slowly to precool it, then more quickly further down (don't hit the bottom !), until you reach a pressure of about 200-300 mbar. Wait until you see a flame–like output of helium on the other side of the tube, then introduce this end into the cryostat.
7. Wait ≈ 5 minutes (max. 10 min) for the transfer to be completed. You may actually want to time this to make sure that enough Helium has been transferred[2]. When the tank is full there will be an acceleration of gas in the output and "smoke" from the tank (water condensation) will increase. Open the red main valve of the dewar shortly to release excess helium pressure and remove the transfer tube from the cryostat first, then the dewar.
8. Measure the helium level in the cryostat with the dipstick to make sure enough helium has been transferred ($\sim$25 cm of He).
9. Close the top of the cross on the cryostat. Make sure the small relief valves on the dewar and the cryostat (with the rubber tubes on the end) are open.
10. Wait 5 minutes and re-tighten the wingnut on the cryostat. This is typically done after taking down the dewar and closing the back door to the cabin (**don't forget to secure the crane**).

[1] If the tank bottle-neck has an ice-plug, inject helium gas through a stainless steel tube, which you find in the cryo bodega, to blow out the ice, then continue.

[2] If the pressure in the dewar drops below 50 mbar, open the helium gas line and the small valve on the dewar and increase the pressure back up to above 100 mbar.

11. As you leave the cabin, close the hatch.
12. Close the helium valve on the He 4 gas bottle at the compressor level as you go down.
13. From the pedestal, drive the telescope back to PARK position.

Important: As the RX115/230 temperature sensor interferes with most frequencies of this receiver it is always unplugged during observations. It is a good idea to plug it in and check the IRAM cryostat temperatures after a refill. Don't forget to disconnect the cable afterwards.