

XPS Portable transport Suitcase, PTS
(ATM pressure version)
1/2020

The portable sample transfer suitcase is designed to allow transfer of samples from inert atmosphere directly into UHV without exposure to air. It is only compatible with sample pucks or pots. The suitcase arm loads onto the quickflange port on the south side of the STC facing the door, Figure 2. It is mounted with the gate valve oriented vertical up, so the valve actuator mechanism is at 12 o'clock. **Be careful with the Hand Valve to the STC, Figure 2, where the Transport arm gets attached. This valve is not interlocked and a mistake could lead to venting of the STC (SAC).**

- (1) Always keep the transport arm capped to avoid damage to the KF mount (when not attached to anything).
- (2) You need to mount your sample on a puck in an inert atmosphere.
- (3) Place the PTS into the inert atmosphere box.
- (4) Open the PTS's gate valve and with the valve actuator oriented at 12 o'clock, move the claw out of the arm so it can be accessed.
- (5) Mount the puck with your sample on the portable transport arm claw using the bottom groove (Figure 1), such that the sample faces up with the gate valve actuator mechanism at 12 o'clock. Be careful not to damage the pin at the end of the claw that holds the puck in place. Ensure the sample is secure, since the puck will be vertical during sample transport.
- (6) Hold the suitcase arm such that the VAT label on the valve is oriented up while transferring the arm to the Kratos. In this orientation, the sample is vertical, but the claw holds the puck from beneath. Holding it the wrong way may cause the sample to fall out during transport. Use the screw on the end of the arm to lock the magnet in place during the transfer.
- (7) When you arrive at the Kratos, check that the pressure in the STC is $< 10^{-8}$ Torr and that the Load Lock, LL, Turbo is running. If not start it up and wait till the LL pressure is $< 10^{-7}$ -Torr.
- (8) Check that the valve to the STC is closed by turning the valve clockwise (the one attached to the KF Flange that faces down), Figure 2. **TAKE CARE: there are no interlocks on the valves for the transport arm. You can vent the STC by mistake!!! If the**

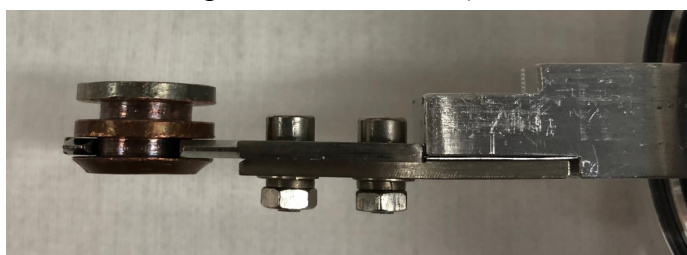


Figure 1 Puck mounted on portable transport arm claw.

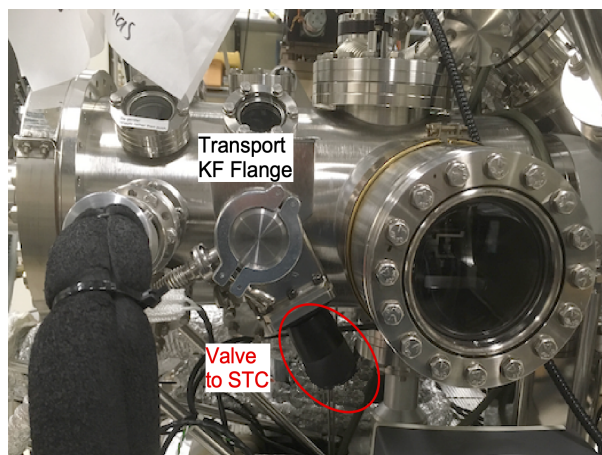


Figure 2 Valve to STC and Transport KF Flange.

Atmospheric Pressure Portable Transfer Suitcase Directions

valve to the STC is open, close it, and call a GLA.

- (9) Vent the LL and wait till it comes up to atmosphere.
- (10) If the valve to the Transport is closed, open it, Figure 3. This valve should be left open all the times to prevent forming pressure differentials that can damage the pump or compromise the atmosphere of the STC if valves are inappropriately handled.
- (11) Attaching the Transport arm to the Transport KF Flange, Figure 2:
 - a. Remove the cap from the transport KF flange and from the PTS arm port, Figure 2.
 - b. Attach the PTS with the valve actuator facing up to the KF flange.
 - c. Fasten the arm with the clamp for the KF with the bolt/screw facing down, Figure 2.
- (12) Restart the LL turbo pump and check that “V to transport” valve is open, Figure 3, so the space between the transport arm and the STC gets pumped down.
- (13) Put sign on the LL turbo that the transport are is attached and the operation of the LL turbo should not be changed.
- (14) Keep the valve on transport arm **closed** and wait until the turbo pump reaches full speed and the pressure is $<10^{-4}$ Torr
- (15) Vent LL again (venting LL is only possible if turbo pump is up to speed).
- (16) As soon as pressure gauge on LL reads 7.5×10^2 Torr, i.e., the LL is still under a slight vacuum, start the LL turbo pump again and open the hand valve on the transport arm, Figure 4, the handle facing up, (**NOT THE VALVE to STC FACING DOWN!!!!**)
- (17) Wait until LL pressure is $<10^{-6}$ Torr, takes about 1h.
- (18) Open the regular LL/STC gate valve using the computer to check if it can actually be opened and no interlock prevents it (if you cannot open this valve, check if LL is at low enough pressure and the normal LL transport arm is fully retracted; if these were not the problem, stop here and call a GLA)
- (19) **CRITICAL STEP:** Check that
 - a. The regular LL/STC gate valve is open
 - b. “V to transport valve” is open, Figure 3
 - c. Hand valve on the PTS (the one facing up) is open, figure 4.
 - d. **ONLY THEN** it is safe to open the valve to STC (the one facing down), Figure 2. If a, b or c is not open **STOP HERE** and restart from step (6).
- (20) Unlock the magnet and extend the PTS transport arm into the STC chamber.

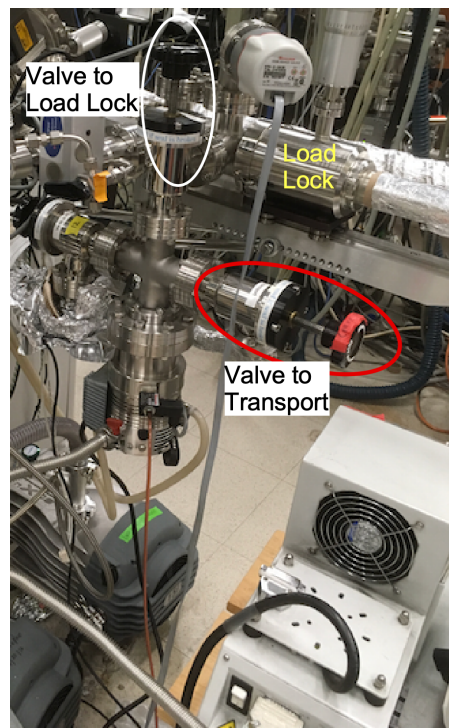


Figure 3 Valve to Transport and Valve to LL from Turbo pump

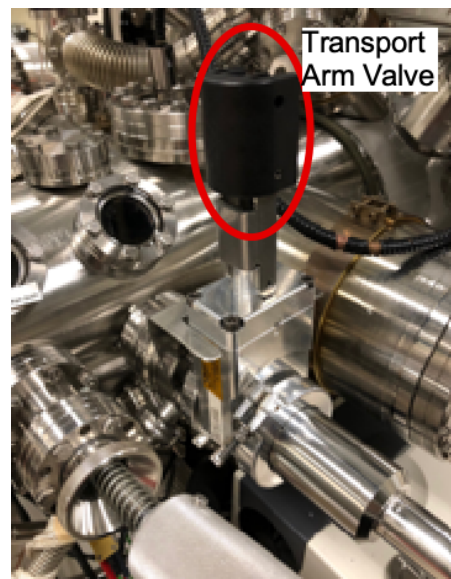


Figure 4 Transport arm attached to the KF Flange with transport arm valve handle facing up.

Atmospheric Pressure Portable Transfer Suitcase Directions

- (21) Transfer your sample from the PTS claw onto the claw for the STC/SAC arm, Figure 5.
This may require gently manipulating the suitcase arm to adjust its height inside the STC.
Do not push or pull the PTS too hard or you will damage it.
- (22) Fully retract Transport arm back into its chamber, lock the magnet, and close the PTS valve, Figure 4.
- (23) Close valve to STC (the one facing down, Figure 2), **make sure that it is fully closed.**
- (24) Close the regular LL/STC gate via the computer.
- (25) Check that the pressure in STC goes back to normal (if not the manual valve might still be open, close it.)
- (26) When pressure is low enough $<10^{-8}$ Torr, you can transfer your sample into the SAC as described above.
- (27) To remove the transfer arm from the Kratos.
 - a. Make sure the valve to the STC is closed, Figure 2.
 - b. Vent the LL.
 - c. When the pressure is up to atmosphere ~ 10 minutes), remove the transport arm from the KF Flange port.
 - d. Attach the KF flange blank to the KF port.
 - e. Restart the LL turbo.



Figure 5 View into STC with transport arm extended into the chamber and transferring puck to STC to SAC arm.