How to change a sample with the Janis Cryofurnace and the Low Temperature Stick (5-500 K):

1. Remove old sample:
   a. Disable alarm by clicking the "Alarm Enabled" button in the Lakeshore box on the dashboard (Fig 1).
   b. Ensure that the sample and VTI temperatures are between 100 and 350 K. (To speed cooling, add 100 mbar of He and set VTI setpoint to 100-250K.)
   c. Turn off all heaters by hitting the red "ALL OFF" button on the front of the LakeShore 336 controller, (Figure 2). The adjacent red lights for Control Outputs 1 & 2 should turn off.
   d. Close the secondary shutter, place the sample pit in access mode (see BL-11a Shutter Operation guide) and enter.
   e. On the Helium Pump / Purge Controller (Figure 3), change the mode switch from Remote to Local.
   f. Turn three-way valve to closed position, pointing down.
   g. Open the Manual Bypass valve.

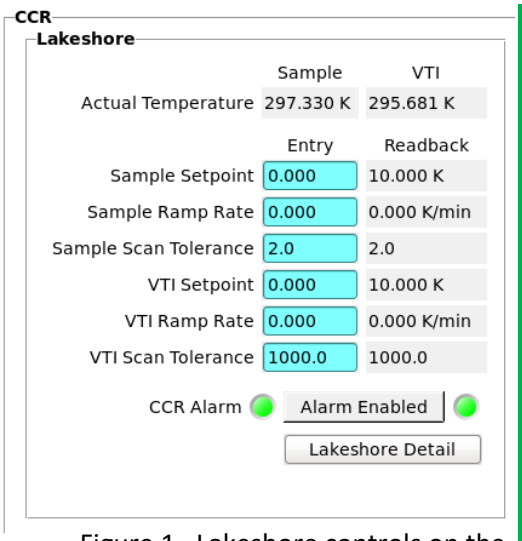

Figure 1. Lakeshore controls on the dashboard.

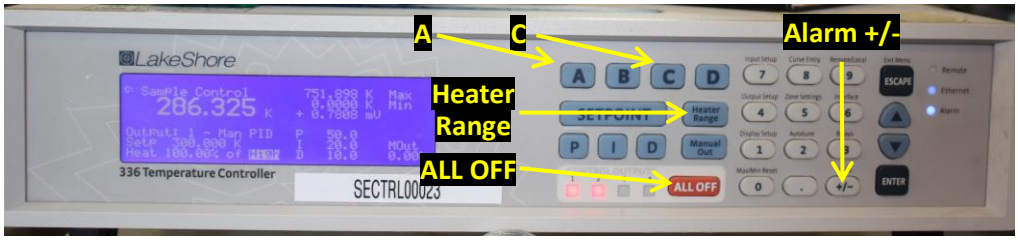

Figure 2. LakeShore336 controller

   h. In the sample pit, unplug the 12-pin connector from the stick (Figure 4). The LakeShore will beep.
   i. Start flowing He, by turning the three-way valve to point to the gas line on the right (Figure 4).
   j. Immediately loosen and remove the stick flange clamps, leaving He flowing.
   k. Once the pressure on the gauge has reached approximately 1000 mbar, carefully remove the sample stick, handling it by the black part, and hang it in the stick holder in the pit.
   l. Cover the hole with the blank and turn the three-way valve to vacuum on the left.

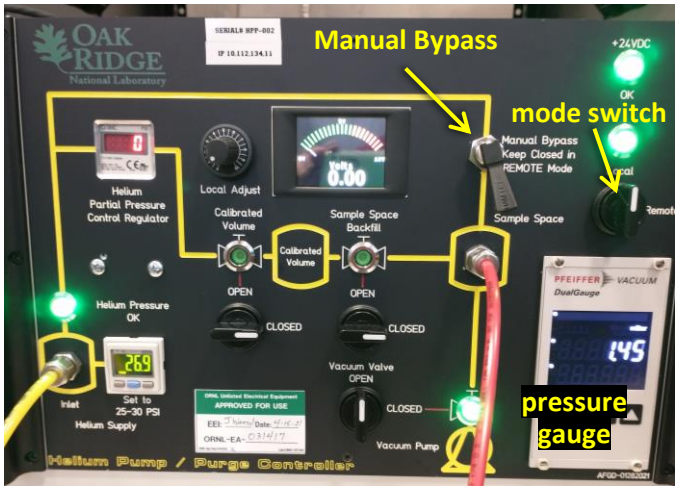

Figure 3. Helium Pump / Purge Controller

Warning: Various sections of the sample stick may be hot or cold. Wear thermal gloves if needed to protect from extreme temperatures.

   m. Remove the heat shield (Figure 5) by removing the four screws. Be careful not to bend the stick.
   n. Scan the sample with the RadEyeG radiation monitor, remove from stick and place with its barcode tag in the appropriate beamline location, on the wooden bench in the RMA.

If the RadEyeG radiation monitor alarms or if loose powder is observed, immediately stop what you are doing and call the RCT (865-274-8658).

BL-11a Janis LT Stick Sample Change

2. Load new sample:
   a. Use a heat gun and wipes to completely dry any condensation on the stick. Do not leave the heat gun focused on one spot for a long time, to avoid damaging the wires.
   b. Place the new sample onto the stick. Replace the heat shield, aligning the marks.
   c. Turn the three-way valve to He to the right.
   d. Once the press on the gauge has reached approximately 1000mbar, remove the blank, while continuing He flow.
   e. Carefully place the sample stick into the cryofurnace, aligning the marks.
   f. Turn the three-way valve to vacuum to the left.
   g. Replace and tighten the stick flange clamps. Tighten each clamp a little at a time, in a cross pattern.
   h. Once the pressure gauge is reading approximately 0 mbar, turn the three-way valve to He flow.
   i. Once the pressure gauge is reading approximately 900mbar, turn the three-way valve to vacuum.
   j. Repeat steps h&i twice.
   k. Close the Manual Bypass valve.
   l. Turn the three-way valve to point to the right.
   m. Reattach the 12-pin plug to the sample stick.
   n. On the front of the LakeShore 336 panel, reset the alarm by turning it off and immediately back on again. Consecutively press “Alarm +/-”, select *NO*, select *input C*, select *Alarm*, press up arrow to set it to *Off*, and press “Enter”. Then, select *Alarm* again, press down arrow to set it to *On*, and press “Enter”.
   o. Turn the VTI heater on by pressing “A”, “Heater Range”, up arrow to select *High*, then “Enter”.
   p. Turn the sample heater back on by repeating step n, starting with button “C” instead of “A”.
   q. Re-enable alarm by clicking the “Alarm Disabled” button in the Lakeshore box on the dashboard (Fig 1).
   r. On the Pump/Purge/Backfill screen, press the Backfill Only button. The sample space will be filled with approximately 100mbar of He..

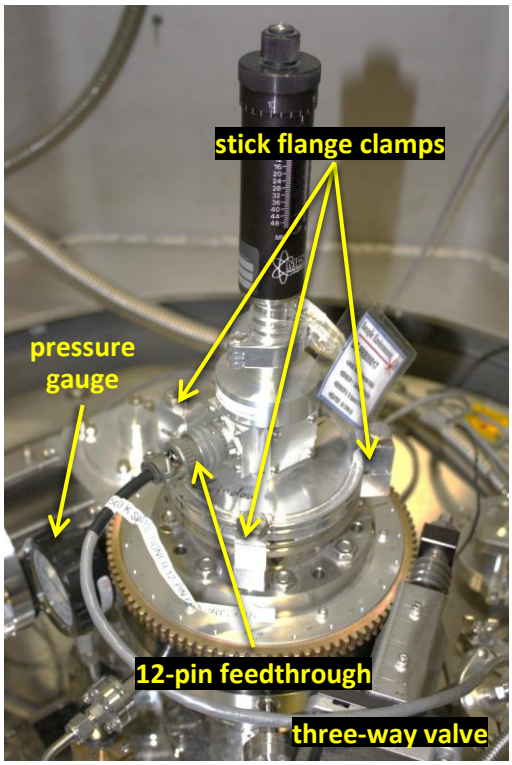

Figure 4. Sample stick connections

Figure 5. Sample stick and heat shield.