

## How to change a sample with the Janis Cryofurnace and the High Temperature Stick:

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 front of 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 the three-way valve to the left to evacuate the sample space (Figure 4).
  - g. Pull open the manual bypass valve.
  - h. Unplug the 12-pin connector from the stick (Figure 4).
  - i. Carefully unplug the two purple thermocouples from the stick.
  - j. Remove the stick flange clamps (Figure 4).

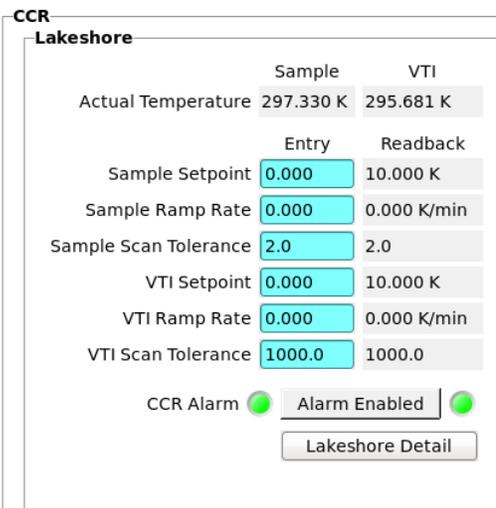


Figure 1. CCR controls on dashboard.



Figure 2. LakeShore336 controller

- k. Immediately start flowing He, by turning the three-way valve to the right to leave He flowing (Figure 4).
- l. Once the pressure gauge has reached approximately 1000 mbar, carefully remove the sample stick and hang it in the stick holder in the pit.
- m. Cover the hole with the blank, then turn the three-way valve to the left.

**Warning: Various sections of the sample stick may be hot or cold. Wear thermal gloves if needed.**

- n. Remove the passive heat shield (Figure 5) by backing out the four screw posts.
- o. Remove the active heat shield by removing the four screws. Be careful not to bend the stick.
- p. 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.

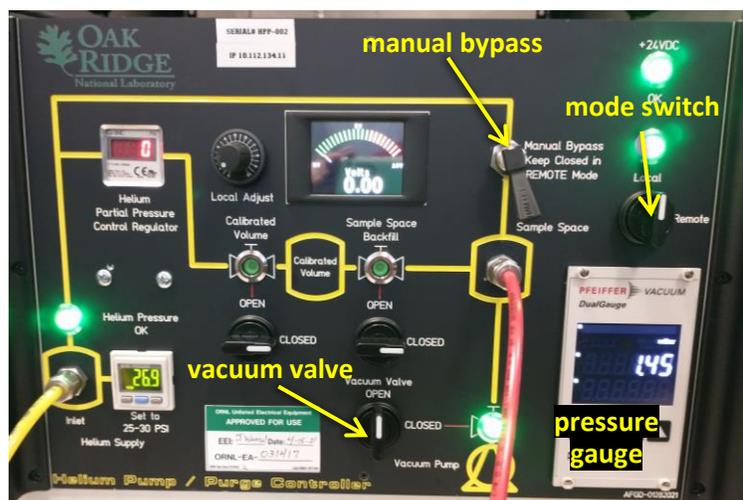


Figure 3. Helium Pump / Purge Controller

**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).**

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. Height from the bottom of the flange to the beam center should be 42.25 inches.
  - c. Replace the active heat shield, aligning the marks. Replace the passive heat shield.
  - d. Turn the three-way valve to the right to leave He flowing.
  - e. Once the pressure gauge has reached approximately 1000mbar, remove the blank, while continuing He flow.
  - f. Carefully place the sample stick into the cryofurnace, aligning the marks.
  - g. Turn the three-way valve to the left.
  - h. Replace and tighten the stick flange clamps. Tighten each clamp a little at a time, in a cross pattern.
  - i. Once the pressure gauge reads below 10 mbar, turn the three-way valve to the right.
  - j. Once the pressure gauge reads approximately 900mbar, turn the three-way valve to the left.
  - k. Repeat steps j&j twice, for a total of three pump/purge cycles.
  - l. Close the manual bypass valve.
  - m. Change the mode switch from Local to Remote.
  - n. Turn the three-way valve to the right.
  - o. Carefully reattach the two thermocouples to the sample stick, matching the marks and labels.
  - p. Reattach the 12-pin plug to the sample stick.
  - q. On the front of the LakeShore 336 panel, turn the VTI heater back on by pressing consecutively "A", "Heater Range", up arrow to select *High*, then "Enter".
  - r. Turn the sample heater back on by repeating the above step, starting with button "C" instead of "A".
  - s. In the hutch, re-enable the alarm by clicking the "Alarm Disabled" button in the Lakeshore box on the dashboard (Fig 1).
  - t. For very high temperature (600-800 K) operation only, on the Pump/Purge/Backfill screen, press the Pump button. The vacuum valve will open to actively pump the sample space.
  - u. For lower temperature ( $\leq 500$  K) operation only, on the Pump/Purge/Backfill screen, press the Backfill Only button. The sample space will be filled with approximately 100mbar of He.

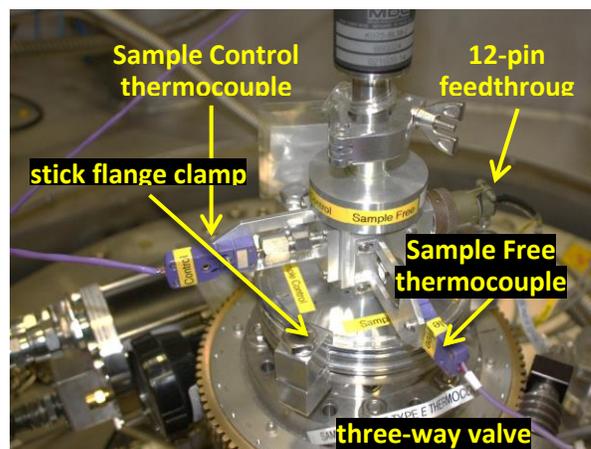


Figure 4. Sample stick connections

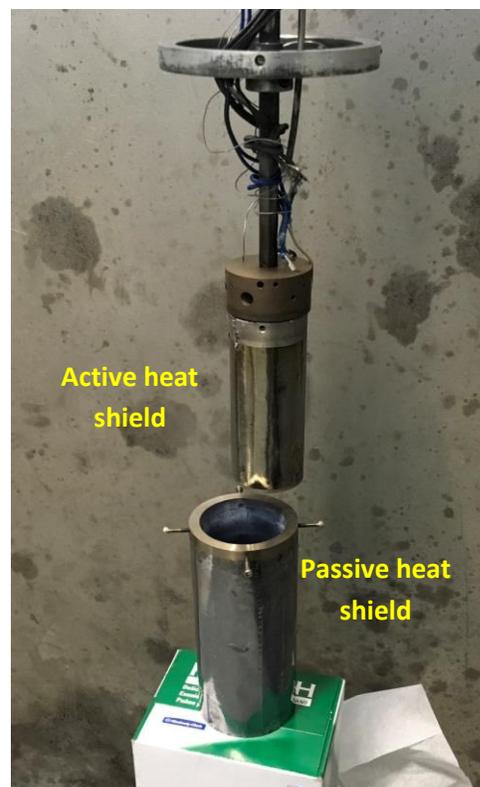


Figure 5. Sample stick and heat shields.