

Janis Top-Loading CCR (J-CCRT) Sensor, Heater, and Cable Configuration for Cold and Hot operation

1. Cold Operation Sensor Cabling and Temperature Control Setup

STEP 1.1, 1.3

NOTE

During **Cold Operation**:
The **VTI** uses the **control** cable
The **Stick** uses the **monitor** cable

- 1.1 Connect control cable (Figure 1) to VTI connector (Figure 2) on the J-CCRT and Lakeshore 336 temperature controller (Figure 3). When connecting control cable connector **A** to the temperature controller, plug cable connector **A** (Figure 4) to temperature controller input **A** (Figure 5).



Figure 1



Figure 2



Figure 3

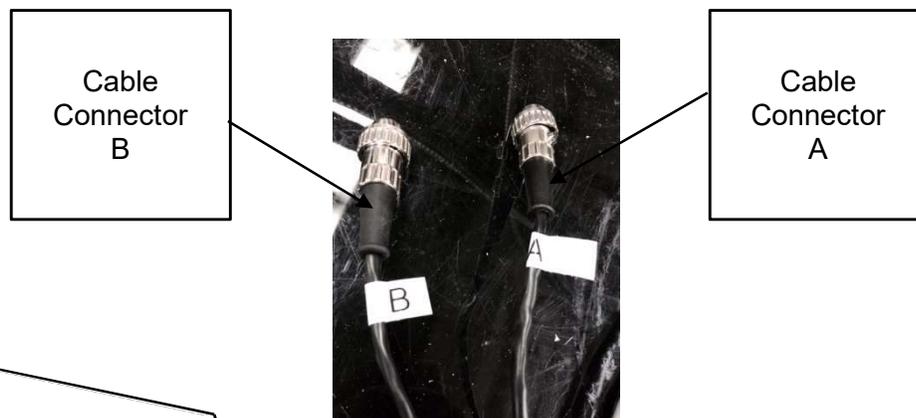


Figure 4

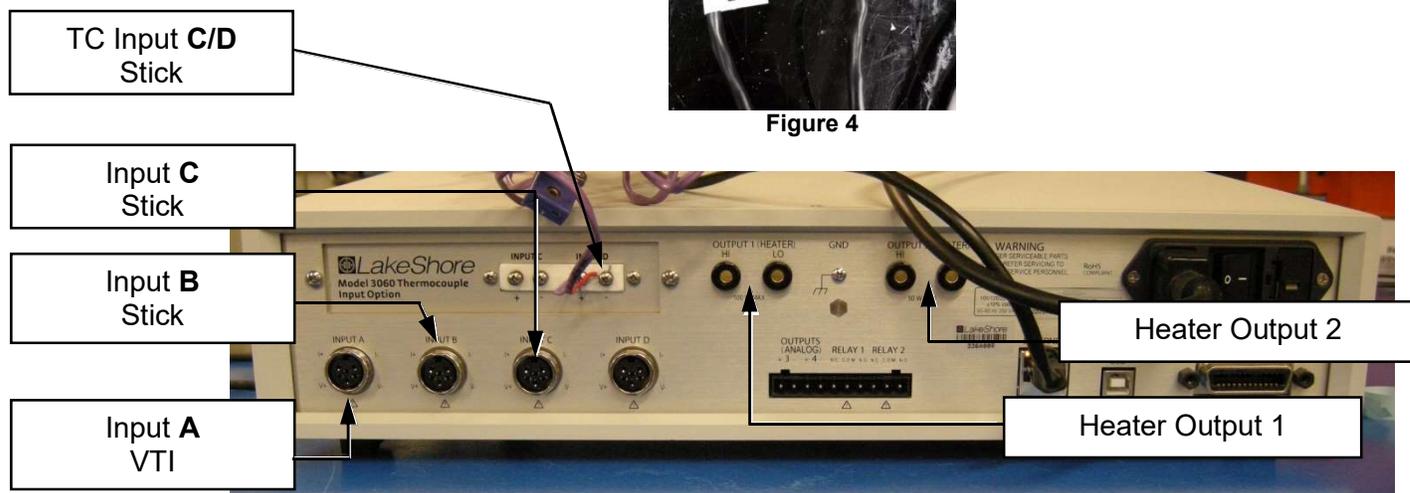


Figure 5

- 1.2 Connect the heater plug (Figure 6) from the control cable to the temperature controller heater output 1 (Figure 5).

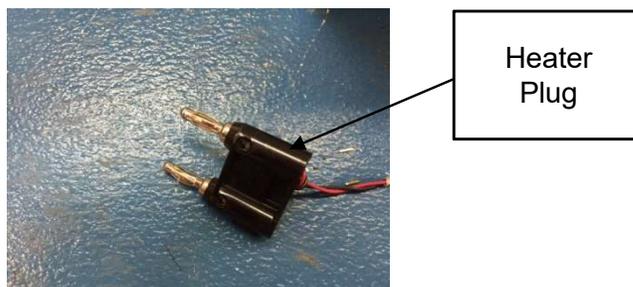


Figure 6

- 1.3 Connect the monitor cable (Figure 7) to the sample stick connector (Figure 8) and Lakeshore 336 temperature controller. When connecting monitor cable connector **A** to the temperature controller, plug cable connector **A** (Figure 4) to temperature controller input **B** (Figure 5).



Monitor Cable

Figure 7

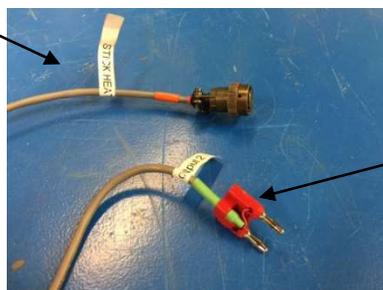


Sample Stick Connector
(Cold: Monitor/
Hot: Control)

Figure 8

- 1.4 Connect the sample stick heater cable (Figure 9) to stick heater connector (Figure 10).

Sample Stick Heater Cable



Heater plug

Figure 9

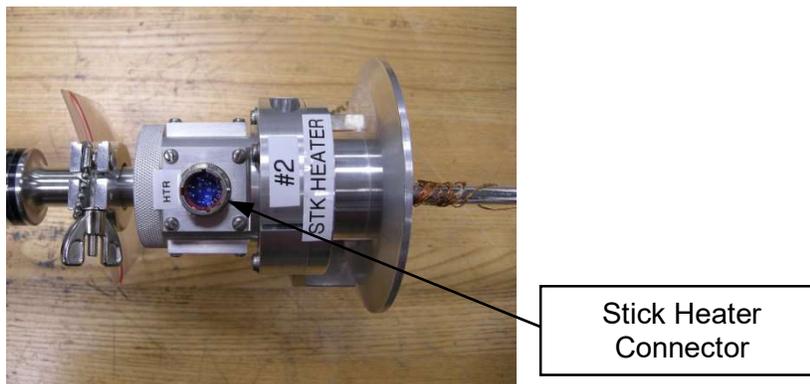


Figure 10

- 1.5 Connect the heater plug (Figure 9) from the sample stick heater cable to temperature controller heater output 2 (Figure 5).
- 1.6 Ensure the appropriate sensor curves and heater settings are selected for the VTI and Sample Stick for cold operation (Figure 11).

Input/Output	Description
Input A	VTI Silicone Diode DT-670 (Control cable connector A)
Input B	Stick Fixed Button Silicone Diode DT-670 (Monitor cable connector A)
Input C	Stick Free Length Chip Silicone Diode DT-670 (Monitor cable connector B)
VTI Heater Output 1	25Ω - 100W – 2amp (controlling Input A)
Stick Heater Output 2	50Ω - 50W – 1amp (controlling Input B)

Figure 11

- 1.7 Ensure over-temperature (O.T.) controller and over-temperature thermocouple (O.T. TC) are connected and set to approximately 90°F (Figure 12).



Figure 12

2. Hot Operation Sensor Cabling and Temperature Control Setup

STEP 2.1, 2.2

NOTE

During **Hot Operation**:
 The **VTI** uses the **monitor** cable
 The **Stick** uses the **control** cable

- 2.1 Connect monitor cable (Figure 7) to VTI connector (Figure 2) on the J-CCRT and Lakeshore 336 temperature controller (Figure 3). When connecting control cable connector **A** to the temperature controller, plug cable connector **A** (Figure 4) to temperature controller input **A** (Figure 5).
- 2.2 Connect the Control Cable to the Hot Sample Stick Connector (Figure 8). When connecting control cable connector **A** to the temperature controller, plug cable connector **A** (Figure 4) to temperature controller input **B** (Figure 5)
- 2.3 Connect the heater plug from the control cable (Figure 6) to the temperature controller heater output 1 (Figure 5).
- 2.4 Connect the E-Type TC (Figure 13) to the Hot Sample Stick TC Connector (Figure 14).

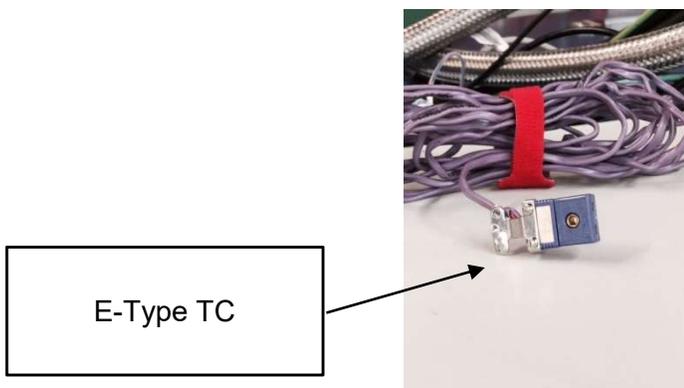


Figure 13



Figure 14

Hot Sample Stick
TC Connector

2.5 Ensure the appropriate sensor curves and heater settings are selected for the VTI and Sample Stick for hot operation (Figure 15).

Input/Output	Description
Input A	VTI Silicone Diode DT-670 (Monitor)
Input B	Hot Stick Pt-100
TC Input C/D (Figure 5)	Hot Stick E-Type T.C.(Control)
Heater Output 1	Hot Stick = 50Ω 50W – 1amp (controlling Input C)

Figure 15

2.6 Ensure O.T. controller and O.T. TC are connected and set to approximately 90°F (Figure 12).

3. Hot and Cold Operation Using Hot Stick

SECTION 3

NOTE

Condition prior to completing steps in section 3: Cryostat, sample stick, sensor/heater cabling, temperature controller, HEPA vacuum pump, and helium gas cylinder with regulator are connected and set up, controlling in **Hot Operation** (As described in **section 2** of this guide and **sections 5, 6, 10, and 12** of procedure **SEO-CF-004**) on instrument.

3.1 Steps to Transition from Hot Operations (>300K) to Cold Operations (<300K).

- a. Ensure **ALL** input temperatures are reading below 300K.
- b. **IF** helium gas cylinder with regulator are not connected to HEPA vacuum pump vent valve **THEN** connect helium gas cylinder with regulator set to approximately 1-2psi to venting valve (Figure 18).
- c. Once **ALL** temperatures have cooled to, or below, room temperature, close HEPA vacuum pump inlet valve (Figure 16) (Figure 17).

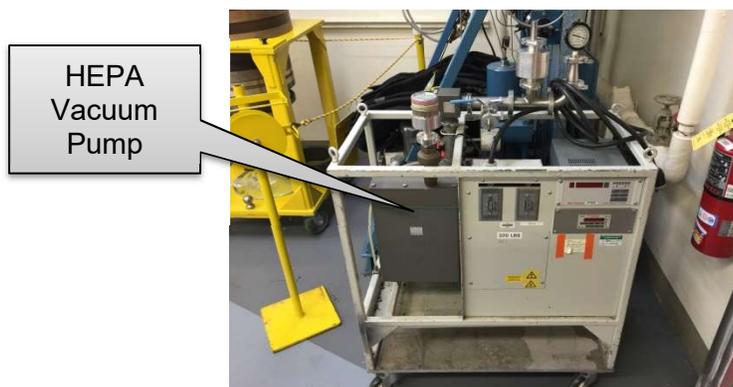


Figure 16

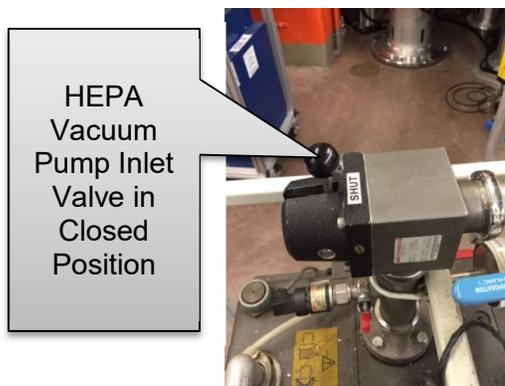
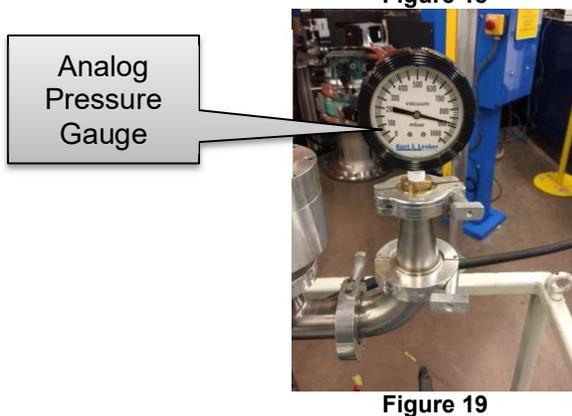
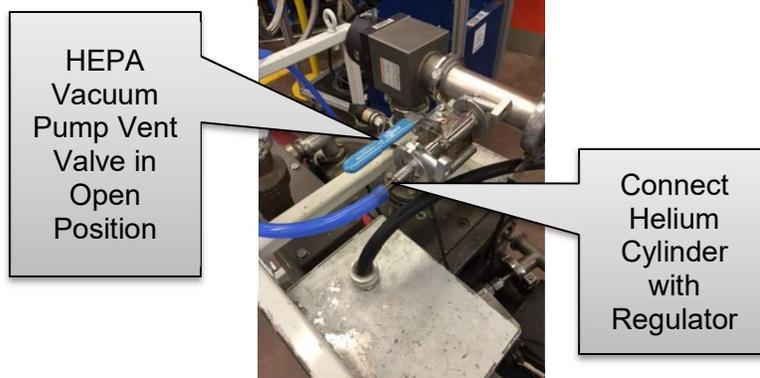
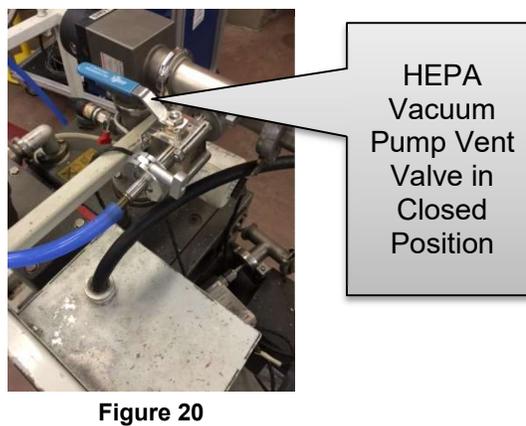


Figure 17

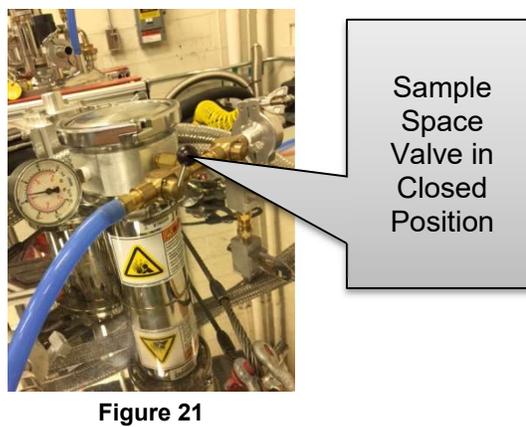
- d. Open HEPA vacuum pump vent valve, venting the sample space with approximately 200mbar of helium exchange gas (Figure 18) (Figure 19).



e. Close HEPA vacuum pump vent valve (Figure 20).



f. Close sample space valve (Figure 21).



g. The system is now set up to run in **Cold Operation**.

3.2 **Steps to Transition from Cold Operations to Hot Operations.**

a. Ensure vti, input A, has cooled below 200K.

b. Open HEPA vacuum pump inlet valve (Figure 22).

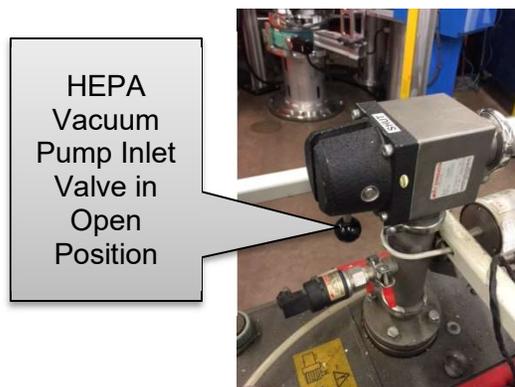


Figure 22

c. Ensure analog gauge displays near zero value (Figure 19).

d. Open sample space valve (Figure 23).

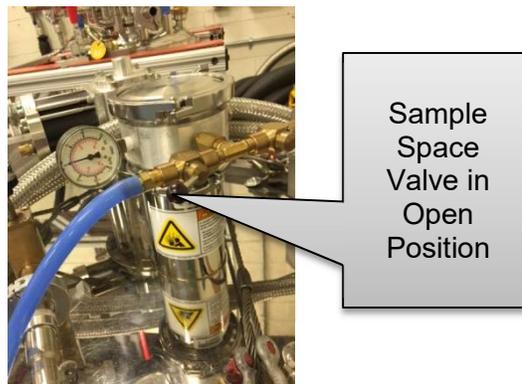


Figure 23

e. The system is now set up to control in **Hot Operation**.