

2003 Lakeshore VSM User Guide

Volume B

Initial Setup



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A newer version including some improvements is under construction.

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NHMFL GAS HANDLING SYSTEM (Helium 4)
NHMFL GAS HANDLING SYSTEM (Helium 3)

MISCELLANEOUS INFORMATION

3. INITIAL SETUP

A. Room Temperature Operation

1. Install Dewar into positioner and center, use Figure 3 as an installation setup guide. The VSM transfer slot must be aligned with the He transfer tubing to allow for He transfers. Proper alignment is required only for cryogenic operations. (Reference Data Mac Computers/ Apple menu/ help/ dewar positioner guide)

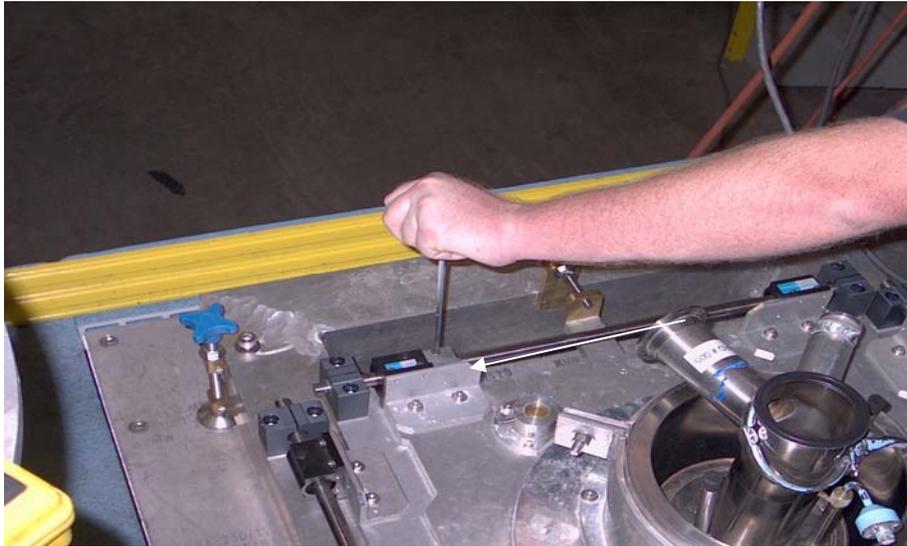


Figure 1 (X-Y Adjustments)

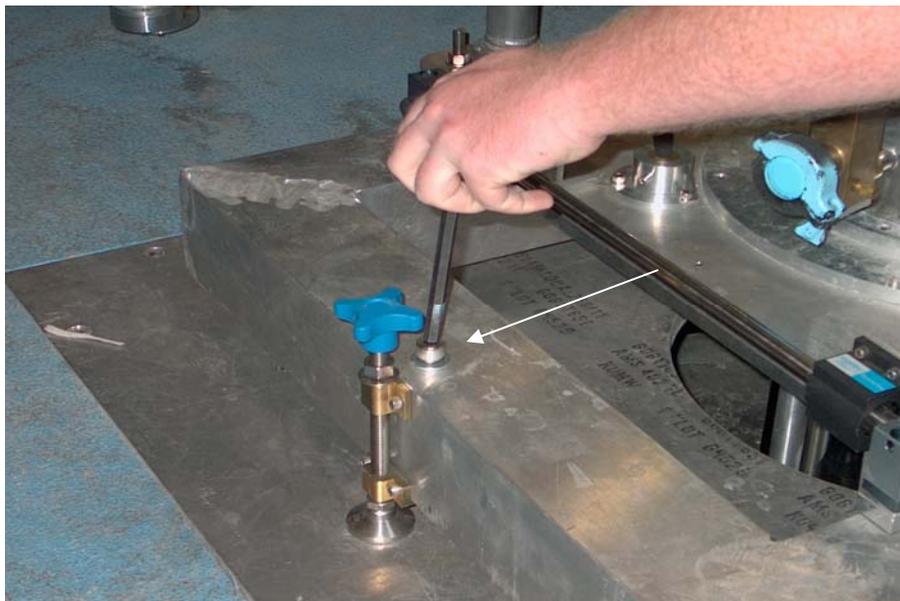


Figure 2 (Tilt Adjuster)

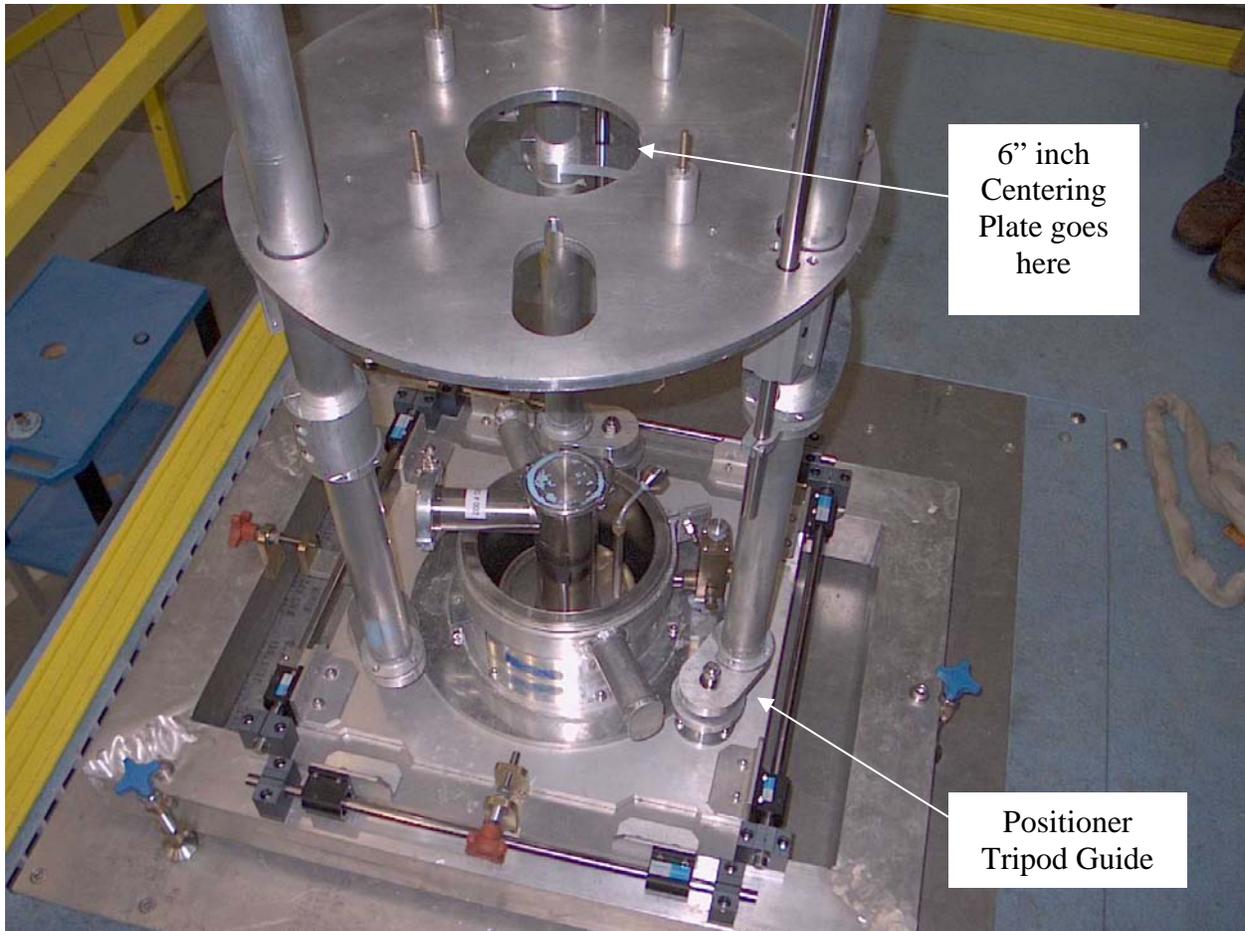


Figure 3 (Dewar cradle alignment/VSM transfer slot)

2. Insert the probe into the dewar. Once the probe has been inserted into the dewar secure in place using the Laddish clamp. Make sure the grommet is seated properly.
3. Mount the VSM tripod See Figure 4. The transfer slot should be located directly over a LHe transfer tube. See Figure 3.



Figure 4 (Tripod)

4. The VSM tripod feet should align with positioner tripod guides. See Figures 3 and 5.

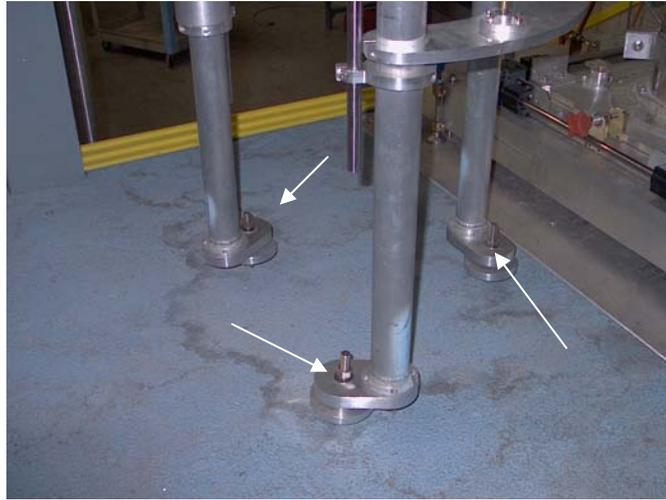


Figure 5 (Tripod Feet)

5. Place the 6" centering plate on the VSM tripod top plate, see Figure 3. Center the top plate with respect to the probe head, using 6" centering plate as a guide. Center the top plate by adjusting the three turn wheels on each tripod leg. Be careful not to use the screws on the support stand. The 6" centering plate can be removed once centering is complete.

Note (1):

Be sure to read Volume A, Section 1. INTRODUCTION, B. Precautions, before continuing.

6. Install the probe head. The probe head valve should be pointing toward the cell entrance. Carefully connect the probe head to probe carefully. If the probe has a rubber stopper in top of it please remove it before installing the VSM Head.

The initial setup is complete at this point. See Figure 6.

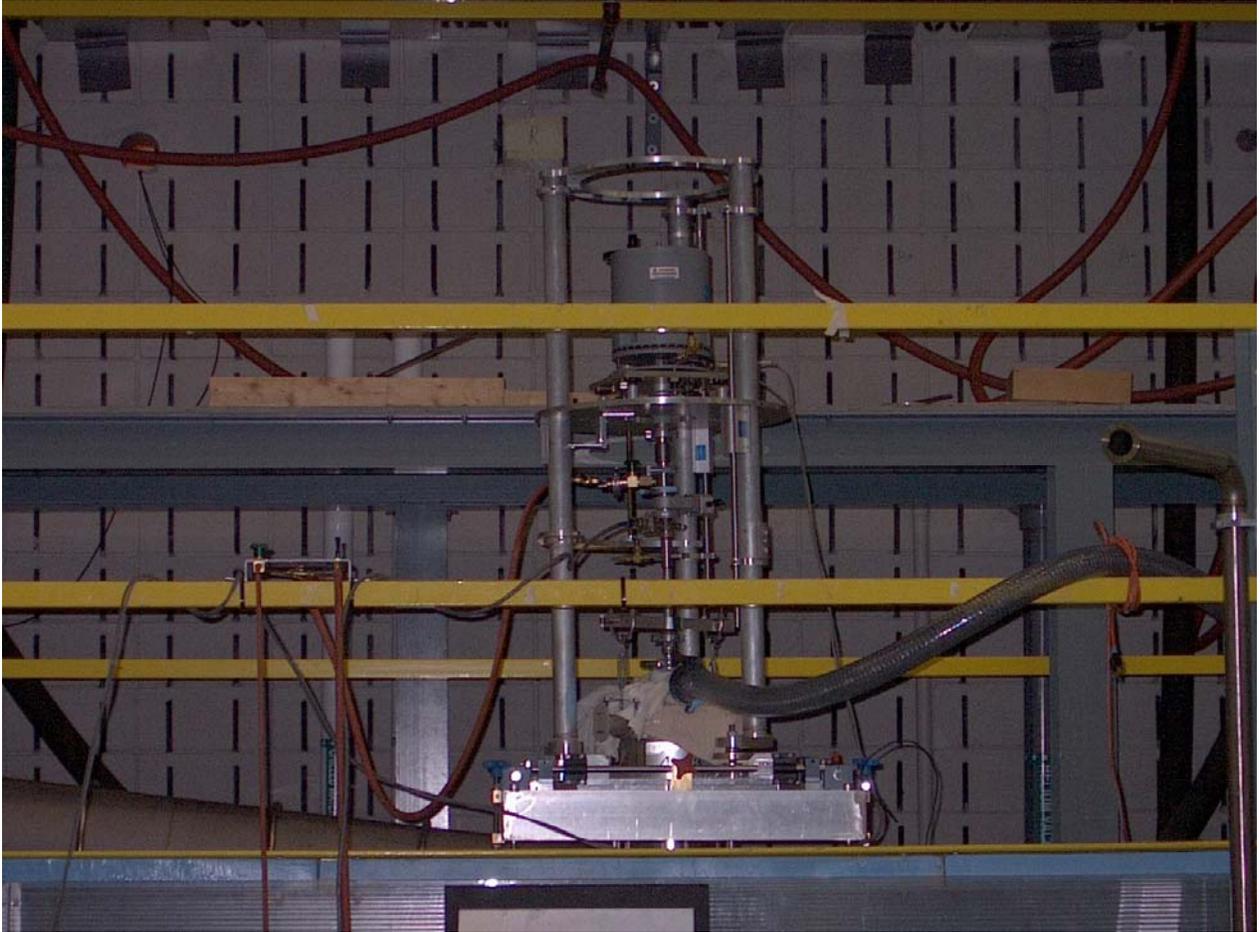


Figure 6

B. Cryogenic Operation

Several dewars are available for cryogenic operations. Intermediate temperatures can be reached using the probe heaters, See Volume C, Section 6. VSM OPERATION, D. Temperature Control. See Figure 7 for reference.

The general procedure is listed below.

1. Select a dewar appropriate for the magnet to be used.
2. Inspect the dewar to make sure that the tail is not damaged. Patch or replace if necessary. The dewar should be dry in the outer and inner space. Use a flashlight to inspect the bottom of the dewar tail for water. Air blow dryers are available to dry out the dewar if water is present.
3. Check if the dewar is complete.
 - 1 He level gauge
 - 2 Rubber grommet to close the top flange
 - 3 Laddish plate to close the top flange
 - 4 Laddish plate (KF-50) with pressure relief and air inlet valve\Handle
 5. Collar

Note (2.1):

Make sure the probe and dewar pump down values reach $1-2 \times 10^{-5}$ mbar before using.

4. Pump out the vacuum jacket at the valve on the outer housing to $1-2 \times 10^{-5}$ mbar using the vacuum pump in the storage area. Follow instructions posted on vacuum pump. Backfill the space with air and pump again to 10^{-5} mbar. The vacuum outlet uses a KF25 fitting

Note (2.2):

The following procedure is for using the turbo pump setup for probe pump down. However, it may be easier to use the vacuum pump, inside Room OP-124, for this procedure. Please follow pump instructions. As you walk into the storage area the vacuum pump is located on your right next to the wall. (See Figure 6).

5. Pump out the probe using the turbo pump setup. The outlet uses a QF 25 fitting. Make sure that the top of the probe is capped with a rubber plug. Remove clamp and install vacuum pump attachment. Make sure o-ring is installed. Start the pump (sensor #2) and switch to position one (1). Open the vacuum valve (green) and pump down the top area of the probe until 10^{-2} . Open the gate valve and continue to pump down the probe until a value of 10^{-5} is obtained. After the desired value is achieved, switch to position two (2) and continue to pump (sensor #1).

Note (3):

Only switch to position one (1) on the turbo pump when the value is lower than 10^{-2}

6. After the desired value is obtained close the gate valve.
7. Close the vacuum valve (green)
8. Remove the pump attachments and install o-ring, blank cap and clamp..
9. Fill precooling dewar with nitrogen and insert probe. Nitrogen can be obtained from the Nitrogen fill station.

Note (3.1):

Perform step 1, Volume B, Section 3, Initial Setup, A. Room Temperature Operation.

10. Precool the dewar by pouring liquid Nitrogen into the outer space. Cover the outer space with rags and keep refilling it until the vigorous boiling calms down.
11. After 1 hr of precooling,, fill the inner space again with Helium gas. Take the rubber stoppers out of the transfer tubes and transfer Helium. Connect a He level meter to the dewar and fill it until it reaches the specified level
12. The probe, which has been evacuated to 10^{-5} and precooled, can now be inserted into the dewar. Remove the Laddish plate and make sure that the Laddish plate grommet is still in place. Lift the grommet over the Laddish pate to prevent grommet from freezing. Slowly insert the probe, wiping off probe with a clean cloth as it is being inserted in the dewar. Install laddish clamp securing probe in place.
13. Connect the 19 – pin connector.
14. Monitor the temperature with the Temperature Controller.
15. With just 1inch of exchange gas the probe will only cool down to around 20 –30 K, but allow measurements up to 150K. See Volume C, Section 6. VSM OPERATION, D. Temperature Control. For operation at 4.2K, add about 1 foot of exchange gas. For operation in pumped Helium, add several feet of exchange gas after the dewar has been pumped. Use the exchange hose for length gauge.

Note: (3.2):

Perform steps 2 - 6, Volume B, Section 3, Initial Setup, A. Room Temperature Operation.

16. Pump down VSM Head.
17. The initial setup is complete at this point.

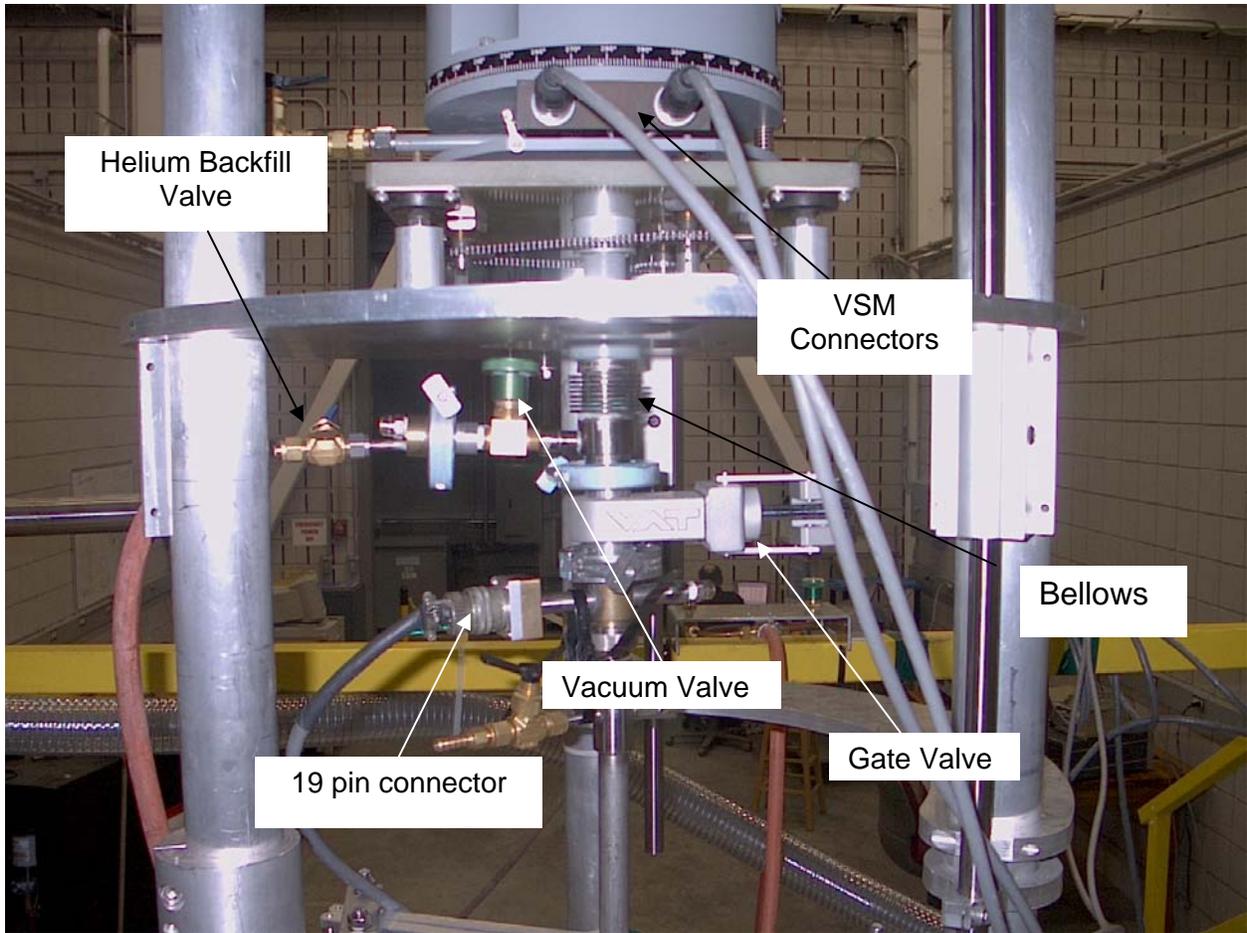


Figure 7