



## Tech Tips

(February 2017)



## Helpful Hints/FAQ's

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Q: What is the recommended time frame to replace the Inline Filter?

A: Per the Preventative Maintenance schedule located in the TEC 3000 Manual, replacement for the Inline Filter is recommended every 12 months.

Q: What is the procedure to replace the Inline Filter?

A: Ensure that the LN2 supply valve is closed and the plumbing assembly is vented before removing the inline filter.

1. Close the LN2 supply valve and disconnect the LN2 transfer hose from the plumbing assembly fill tee.
2. Loosen and remove the fill tee and inline filter from the plumbing assembly.
3. Replace the inline filter (PN 11648945) and reassemble the fill tee and filter to the plumbing assembly using new Teflon tape if needed. Ensure the filter is oriented correctly so that the affixed arrow indicates the direction of LN2 flow.
4. Reconnect the LN2 transfer hose, open the LN2 supply valve and check fittings for any leaks.

Q: What is the procedure to calibrate the LN2 level?

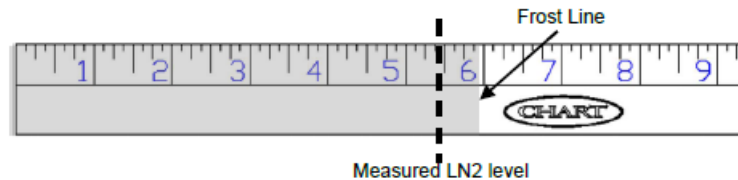
A: This procedure requires the cryogenic meter dip stick supplied with each MVE freezer. This calibration method provides level measurements with a  $\pm 0.5"$  ( $\pm 13$  mm) accuracy. All new freezers equipped with TEC 3000 controllers have been calibrated at the factory. The liquid level should only be calibrated if faulty readings are suspected; the TEC 3000 itself has been replaced, following a firmware update; or as a part of a preventative maintenance schedule.

NOTE: Always wear protective gloves and face shield when handling LN2. Refer to the Safety section of the TEC 3000 manual.

### Dip Stick Procedure

1. Open or remove the freezer lid to access the interior storage space.
2. Hold the meter dip stick vertically with the 0.0 inch end pointed down.
3. Lower the meter dip stick into the LN2 at the bottom of the freezer. Ensure the meter dip stick is vertical and touching the bottom of the inner Dewar. Some LN2 boiling will occur around the meter dip stick.
  - a. MVE High Efficiency / Vapor Series Freezers:  
Insert meter dip stick into the rectangular channel on the turn tray in order to access the liquid below the tray.
  - b. MVE Series and MVE Cabinet Series Freezers:  
Lower the meter dip stick to the bottom of the freezer as close to the center as possible to obtain an accurate measurement.
4. Leave the meter dip stick in the LN2 for approximately 5 seconds.

5. Remove the meter dip stick from the liquid and immediately wave it back and forth in the air. A distinct frost line will begin to develop as moisture in the air condenses on the meter dip stick predominately where it was submerged.
6. Subtract 0.5 inches (13 mm) from the observed frost line to account for the LN2 boiling up around the meter dip stick while it was submerged. This resultant level measurement represents the actual liquid level inside the freezer. Once you have obtained the measured level, proceed to the liquid level calibration.



Above: Meter dip stick showing example level frost line. The resultant measured level would be 5.5 inches after subtracting 0.5 inches from the frost line to account for the LN2 boiling.

Note: LN2 liquid at or above turn tray height will rise higher in the dip stick channel.

### Liquid Level Calibration

NOTE: Liquid level calibration cannot be performed while the TEC 3000 is filling. If TEC 3000 is filling, press "Stop Fill" and perform the calibration. Allow freezer plumbing to thaw 10 to 15 minutes before calibrating.

NOTE: Liquid level calibration is most accurate when calibrated at 10.0 inches (254 mm). Calibration must be performed above 3.0 inches (75 mm).



Above: Level dip stick inserted to measure the physical liquid nitrogen level

NOTE: Security Level 3 or higher is required to calibrate the liquid level.

**1. Press "SETUP"**

Controller will prompt for a password. A flashing cursor will make it clear which digit is being changed. Use the "▲/▼" keys to scroll to the appropriate number. Press "ENTER" to advance the cursor to the next position.

Higher User Level  
Required use ▲▼ to  
ENTER Password  
0000

**2. Press "ENTER"**

The display will read "Temperature Menus".

Press ENTER for  
Temperature Menus  
or press SETUP for  
next menu

**3. Press "SETUP"**

Until the display reads "Liquid Level Menus".

Press ENTER for  
Liquid Level menus  
or press SETUP for  
next menu

**4. Press "ENTER"**

The display will read "High Level Alarm".

High Level Alarm  
8.0 in  
Use ▲▼ to adjust  
Press ENTER to save

**5. Press "SETUP"**

Until the display reads "Advanced Level Menus".

Press ENTER to  
Advanced Level menus  
or press SETUP for  
next menu

**6. Press "ENTER"**

The display will read "Auto Fill Control".

Auto Fill Control  
ENABLED  
Use ▲▼ to adjust  
Press ENTER for next

**7. Press "SETUP"**

Until the display reads "Level Calibration".

Level Calibration  
Press ENTER to  
Start calibration  
or SETUP for next

**8. Press "ENTER"**

The display will read "Please wait while the sensor zeros". Wait for the controller to count down from 60 seconds.

Please wait while  
the sensor zeros  
60 seconds

**10. Press "ENTER"**

The display will read "Level Calibration Complete".

Level Calibration  
Complete

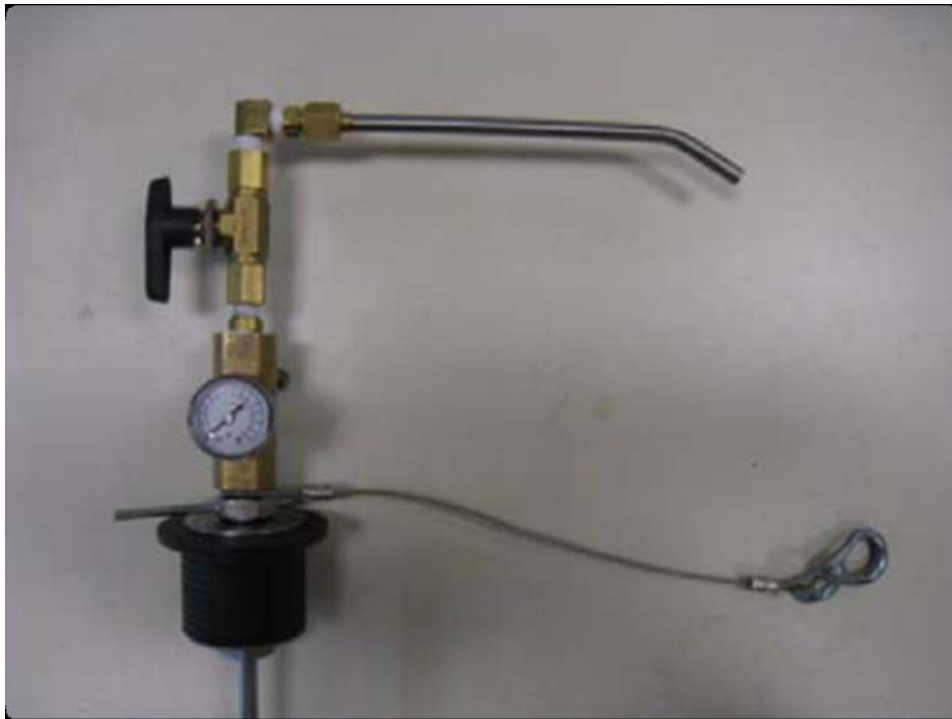
**11) Verify that the home screen reads the liquid level value that was just entered. In some cases the controller should be restarted. Contact Technical support with any questions.**

# Accessories

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## Manual Discharge Device

The manual discharge device attaches to the MVE Lab Series Dewars to dispense liquid. The part number of the manual discharge device depends on the model of Dewar; please see below for description of each part number. The manual discharge device builds pressure to 5 psi.



Manual Discharge Device Part Numbers		
Part Numbers	Inner Diameter	Dewar
10668101	2.2"	Lab 10
13464867	2"	Old Lab 20 (prior to May 2007)
13484139	2.2"	New Lab 20 (after May 2007)
10668004	2.5"	Lab 30
13717369	2.5"	Lab 50

## Low Level Alarm for Aluminum Dewars

Chart sells a low level alarm for our aluminum Dewars that is designed to alert when the level of LN2 in the Dewar is decreasing. The Low Level Alarms include a probe that is inserted through the neck and placed at a user-designated level. When the level of the LN2 goes below the probe, the alarm will sound. Chart sells two variations of these alarms. The Bat 1B alarm uses a 9V battery for power. The Therm-O-Lert uses an 110V or 230V AC supply as well as an internal, rechargeable battery.



Low Level Alarm: PN 11905817 (BAT1-B)



Therm-O-Lert Battery LN2 Level Alarm (230 V): PN 10769489  
Therm-O-Lert Battery LN2 Level Alarm (110V): PN 9710879

**PLEASE CONSULT THE APPLICABLE PRODUCT INSTRUCTIONS FOR USE FOR  
PRODUCT INDICATIONS, CONTRAINDICATIONS, WARNINGS, PRECAUTIONS, AND  
DETAILED SAFETY INFORMATION.**



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