

# E1039 Polarized Target Monitoring & Maintenance Guide

Link to the spreadsheet to record the values:

<https://docs.google.com/spreadsheets/d/1EDTHSeUDGJ9b6beYizHEAJ8-Z1rAiQbZMgKhmloPLw8/>

(navigate to the tables using the labels at the bottom)

# Checking the gHe bottles' levels on the west-wall of the cryoplatfom



Location: Hall

You will need FN000213/CR training to do this

1. Close the regulator (by turning this handle anti-clockwise until you feel it freely rotating)
2. Open the Gas bottle using the **rotating knob** on the top of the bottle (turning anti-clockwise) to read the value of this **meter** on the right hand-side. Close the rotating knob (turning clockwise). once you are done reading the pressure.
3. If this level is below 100psi then replace this bottle with a new one.
4. Make sure to close the bottle (tightening clockwise) and close the regulator (as step 1).



Check the number of LN2 portable dewars outside the loading dock



# Record the number of gHe and gN2 bottles at the outside rack



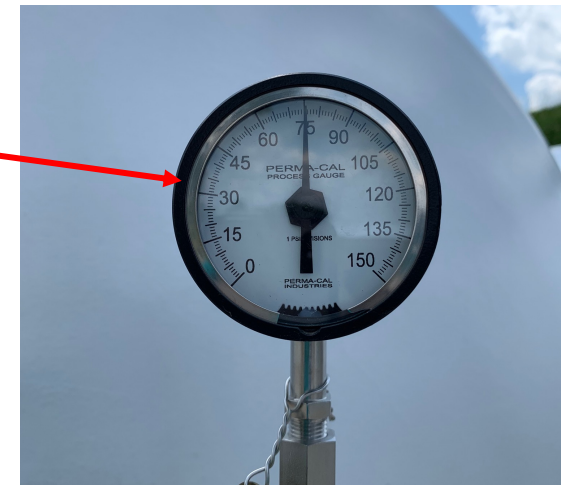
- Read the labels on each bottle to identify for gHe or gN2
- If the number of bottles from either type is less than 4, then please send an email to Kun Liu ([liuk.pku@gmail.com](mailto:liuk.pku@gmail.com)) to order more bottles

# Check gHe pressure and LN2 pressure of the outside tanks



LN2 Tank Pressure  
(Notify Kun if the  
pressure is less than  
10 psi)

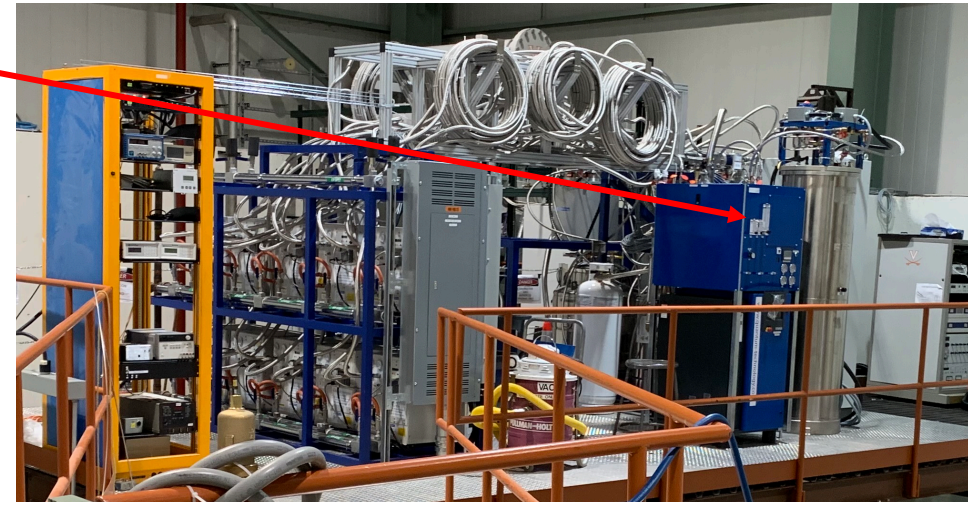
[liuk.pku@gmail.com](mailto:liuk.pku@gmail.com)



gHe Tank Pressure  
(Notify Kun if the  
pressure is less than  
25 psi)

# Check QT HR3 gauges

Location



Check for the labels P10, P6, P8, P40, P41 and record on the spreadsheet

# Check QT liquid (Dewar/purifier) levels

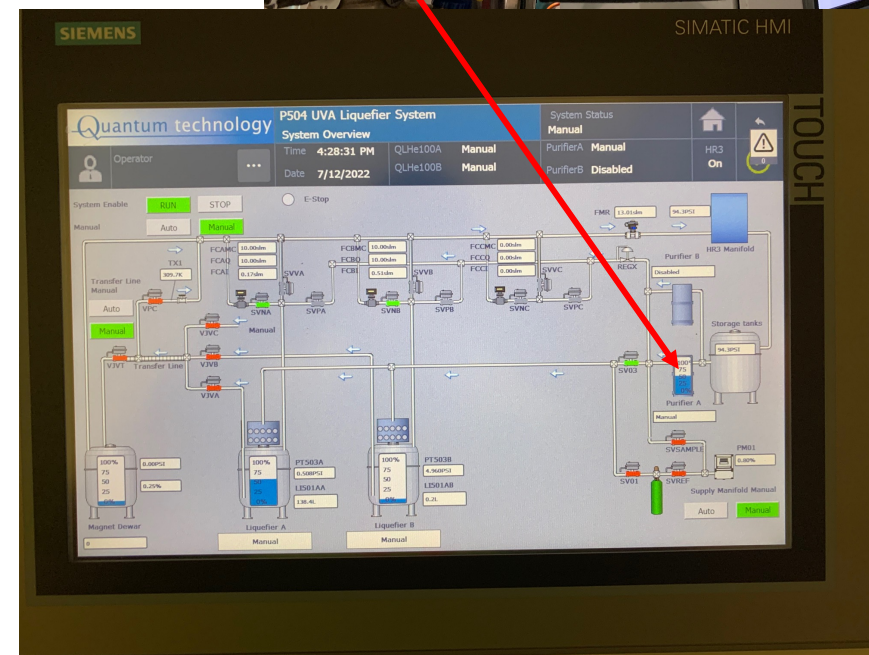
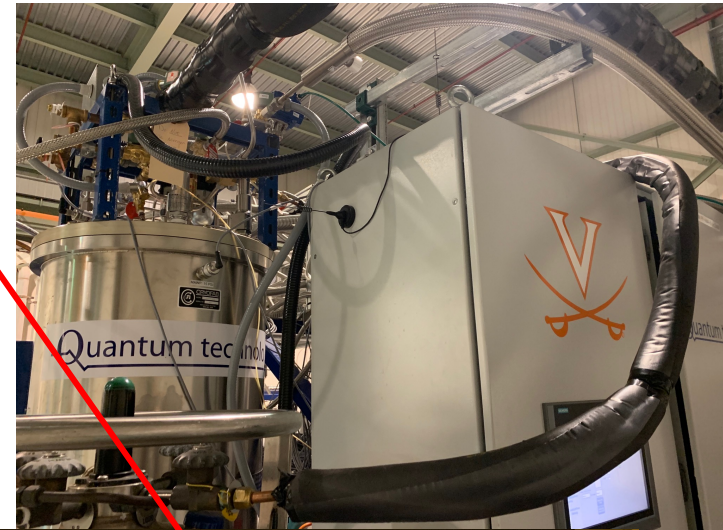
LHe levels

You will need  
FN0000473/OJ

Only for filling LN2 or  
replacing LN2 large  
Dewars

Not required for  
reading LHe levels

LN2 level



Steps to fill LN2 to the purifier Dewar if it's below 50%

<https://confluence.its.virginia.edu/display/twist/Filling+LN2+on+Purifier+Dewar>

Please contact Target Expert shift contact before performing fill/replace LN2 Dewar

★ LHe Dewars A and B

Liquid levels can be read using this meter  
on each Dewar separately

# Monitoring QT compressor LCW temperatures

Look at the logged data using the following link

[https://e906-gat1.fnal.gov/data-summary/e1039/target-cryo-cont.php?subsyst=LabJack+U3&show\\_type=Table](https://e906-gat1.fnal.gov/data-summary/e1039/target-cryo-cont.php?subsyst=LabJack+U3&show_type=Table)

and confirm that the last recording time is within one minute and all the temperature readings are below the limit (115 F).

Target Cryo Control

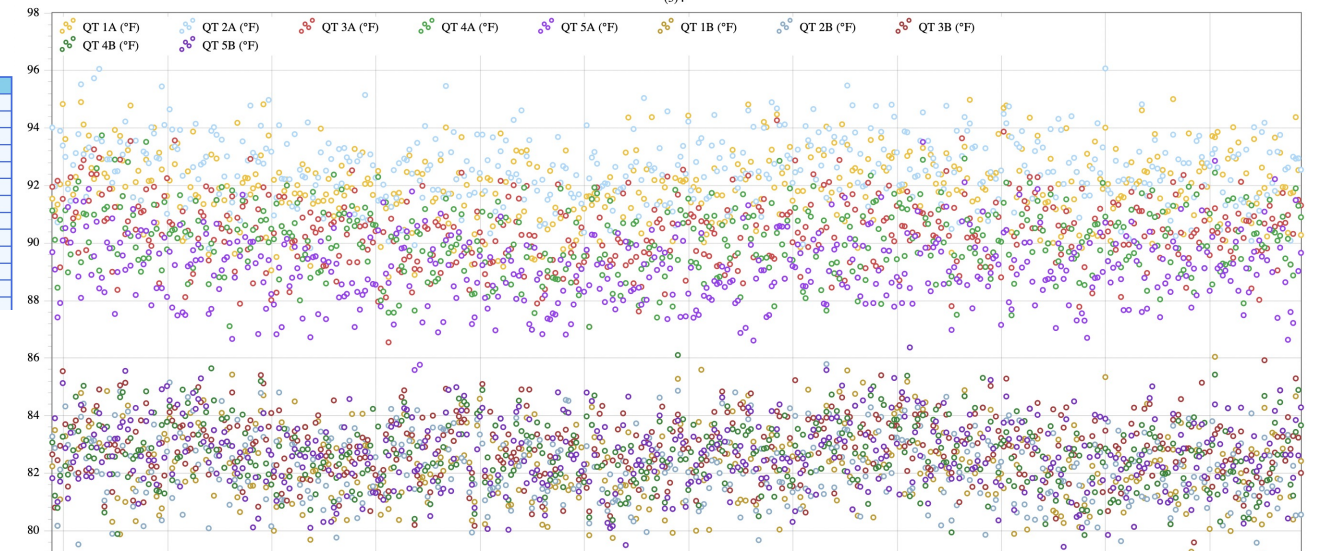
Target Cryo Control

Subsystem LabJack U3 - QT Compressor LCW | From 2022 / 08 / 15 22 : 08 : 53 to 2022 / 08 / 16 00 : 08 : 53 | As Table | Sampling 0

Subsystem LabJack U3 - QT Compressor LCW | From 2022 / 08 / 15 22 : 08 : 53 to 2022 / 08 / 16 00 : 08 : 53 | As Plot | Sampling 0

- This page reads & shows the TSV files under /data2/e1039\_data/target\_data/cryo\_control.
- Each variable has its own timestamp per measurement, but the table shows that of only the 1st variable.
- $N_{\text{parameters}} * N_{\text{points/parameter}} = 10 * 481 = 4810$ . Note that it has to be <190,000 due to the PHP memory use limit.
- Version: PHP 5.4.16

Unix Time	Date Time	QT 1A (°F)	QT 2A (°F)	QT 3A (°F)	QT 4A (°F)	QT 5A (°F)	QT 1B (°F)	QT 2B (°F)	QT 3B (°F)	QT 4B (°F)	QT 5B (°F)
1660626530.05	2022-08-16 00:08:50	92.297177	93.121884	91.678444	92.090952	93.534121	84.032842	83.411730	82.790436	82.583298	83.411730
1660626515.04	2022-08-16 00:08:35	91.381847	93.649991	91.794411	90.762855	88.904821	81.456567	80.834696	83.528144	85.183947	82.699757
1660626500.04	2022-08-16 00:08:20	90.867562	94.166680	91.073903	91.073903	89.835567	80.939891	82.597722	80.939891	82.804859	83.011976
1660626485.04	2022-08-16 00:08:05	92.973688	94.416279	90.911200	90.292074	90.292074	82.227202	81.398304	83.469938	83.884021	82.434375
1660626470.03	2022-08-16 00:07:50	92.735759	91.910908	90.053853	91.704646	89.021471	81.988082	84.059137	82.609611	83.023863	82.816747
1660626455.03	2022-08-16 00:07:35	92.188416	92.807006	91.157046	90.331598	88.266607	81.437993	80.816116	85.786005	82.681194	81.023429
1660626440.03	2022-08-16 00:07:20	91.088802	92.120205	88.404867	89.644019	88.404867	81.783935	81.369439	80.540202	81.369439	81.991152
1660626425.02	2022-08-16 00:07:05	92.753704	93.372134	91.516320	91.103703	88.419786	82.213311	81.591664	81.384408	81.384408	81.798900
1660626410.02	2022-08-16 00:06:50	91.754382	91.341810	89.897194	89.484271	89.277780	82.038043	82.038043	80.794461	81.416344	81.623598
1660626395.01	2022-08-16 00:06:35	89.593167	91.863165	89.180185	89.799628	88.353986	79.866974	80.903802	82.354500	81.525653	80.903802
1660626380	2022-08-16 00:06:20	92.007845	91.389030	89.531531	88.705465	88.705465	81.049224	81.463783	82.706969	81.671032	82.085468
1660626365	2022-08-16 00:06:05	93.502364	94.326620	92.265403	90.821398	90.202247	84.207945	83.793925	85.242642	83.586885	83.793925
1660626349.99	2022-08-16 00:05:49	91.859574	91.859574	89.796034	91.034392	90.828048	83.593557	82.350894	82.972317	83.593557	82.765196





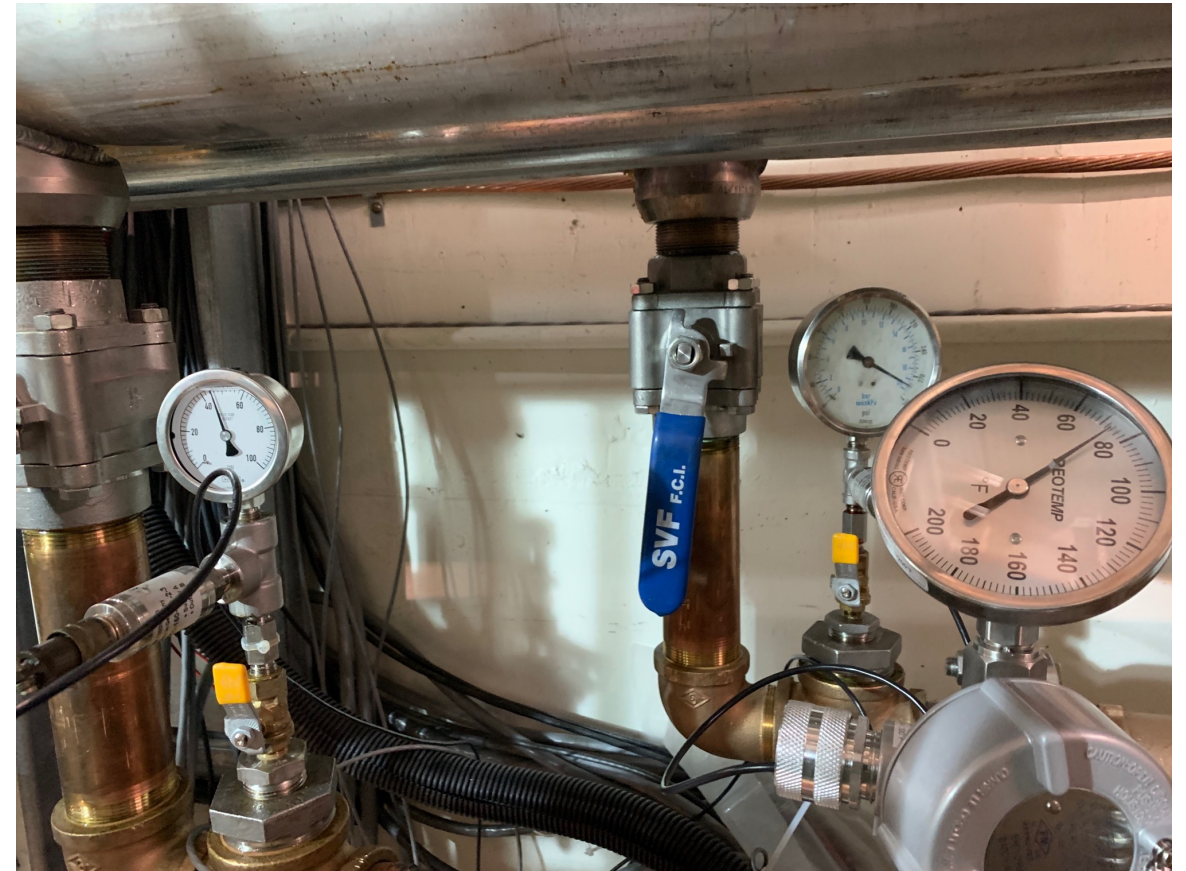
# Filling gHe outside tanks using tube-trailer



At this time, for this task: Please contact the Target Expert on Shift

# Check LCW main inlet, an outlet to NM4

If you are on the cryoplatfrom, take the stairs (towards the lower level) and stop mid-way when you see these gauges towards the East-wall of the hall. You will see labels "LCW Supply" and "LCW Return" on those two separate piping.



Both "LCW Supply" and "LCW Return" has a pressure gauge and a temperature gauge. Mark those values on the spreadsheet.

# Check LCW inlet and outlet parameters to the ROOTS

When you are on the cryoplatfrom proceed to the end of the wall on the west-side as shown on the pictures.

You will see two water panels (top & bottom). There are 5 yellow handles on each panel.

Read the values on each meter  
Inlet meters: manual  
Outlet: digital

Also, read the main supply pressure gauge towards the left of the panels.

Mark the vales on the spreadsheet



# Check ROOTS pumps pressure and temperature using HMI

Location(s)

1. At the control-room
2. On the cryoplatform



Mark these pressure and temperature values on the spreadsheet as shown in the display

# Check oil levels of all 4 pumps

There are 4 pumps in the ROOTs pumps setup

- Check the oil level on each pump
- Oil-level indicators
- When the pumps are running
  - > Level should be around the middle
- When the pumps are not running
  - > Level should be close to “full”

Notify Target Expert shift contact if the levels are different from the above mentioned levels.

