MKS 615

- ▶ Devices
  - ▷ Sensor = Aluminum cylinder
  - ▷ Preamp = Blue box, MKS 615
  - ▷ Controller = MKS 670
  - ▷ Manual: https://manualzz.com/doc/4458938/

- ▶ Sensor function
  - ▷ P_X = Pressure for measurement
  - ▷ P_R = "Zero" pressure reference,
    using "built-in" high vacuum

- ▶ Readout scale
  - ▷ Pressure range = 100 Torr
    — according to blue-box label
  - ▷ Preamp output:
    100 Torr = +10 V??
    — Expected by MKS 670

Test with LN2 on 2021-12-17

- Cooldown
  - The target-nose shell was used as a long "dewar"
  - 70% of the sensor probe was soaked in LN2 at best

- ▶ Result
  - ▷ The reading was "OVERRANGE" (>10 V), shown by MKS 670
  - ▷ The pressure was not low enough (<100 Torr)?
    - ▷▷ Below 100 Torr (= 10 V) is expected by MKS 670
- ▶ Expected pressure??
  - ▷ 20 psi @ 300 K, according to the white tape on the green valve
    - ▷▷ The temperature is just my guess
  - ▷ $\implies$ 5.1 psi = 270 Torr @ 77 K (in LN2)
  - ▷ $\implies$ 0.27 psi = 14 Torr @ 4 K (in LHe)
  - ▷ The LN2 temperature is not sufficient
- ▶ Probe function (provided by Dustin)
  - ▷ The He3 pressure probe should be a capacitive probe with the tube containing the He3 sealed with a flexible membrane comprising one plate of the capacitor.
  - ▷ The probe has been filled with He3 at 20 psig (not psia)
  - ▷ There is a pressure limit of 20 psi to equate enough for about 1cm of liquid in the tube when at lower helium-4 evaporation temperatures.
    - ▷▷ The main range that this probe measures is below 4 K
  - ▷ The pressure measured is the vapor pressure of the He3 (so long as there is no refluxing).
  - ▷ In this state, this is normally a very accurate measurement of temperature.

Next Steps

▶ Try to measure the non-preamplified voltage directly
  ▷ Measure the capacitance at the triaxial cable?
  ▷ Open the blue box to find a point to be probed?
  ▷ Figure out a way using our own simple circuit?
▶ Re-do the test using LHe