CRYOPUMP CRYOSTAT TEST SYSTEM

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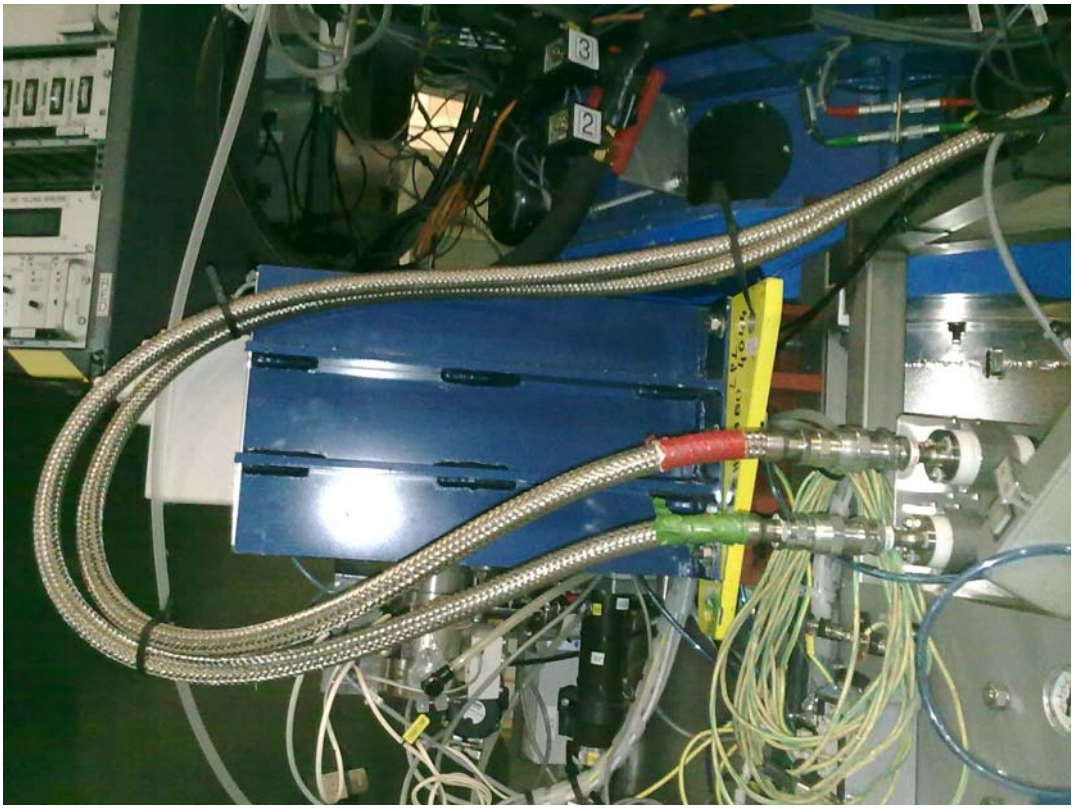
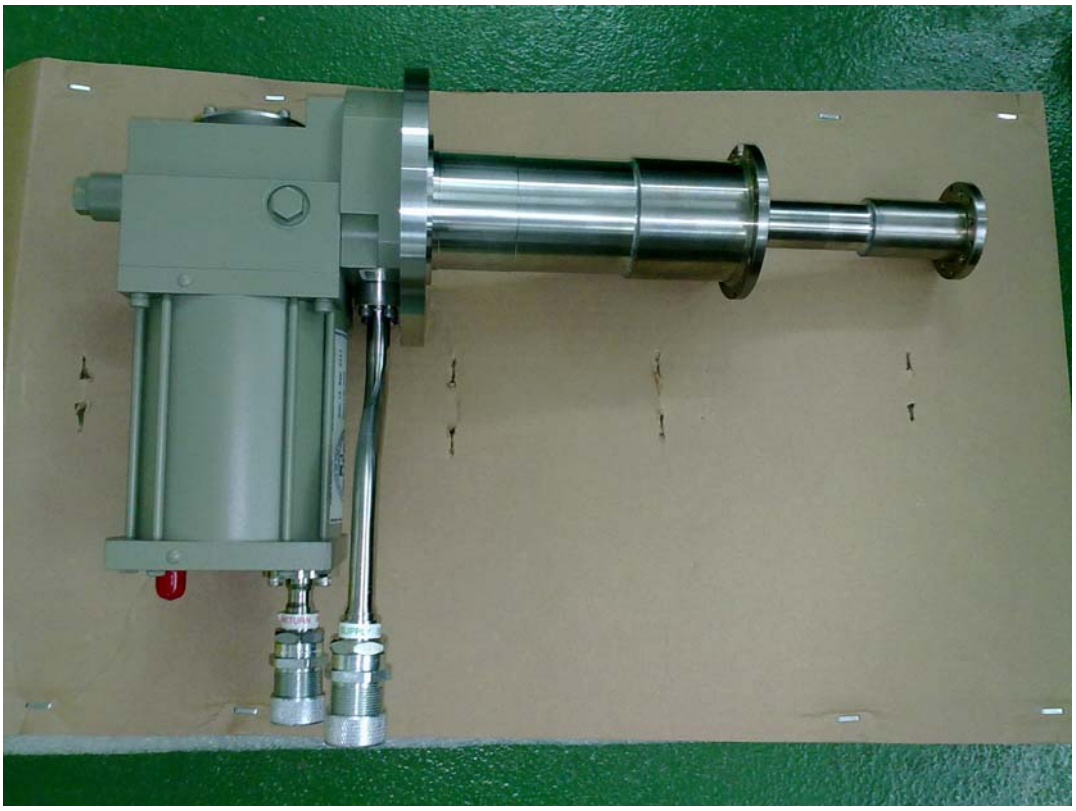
It is a set of components designed for checking the different parts of the cryocoolers, compressors, pipes, cold head of CTI-Cryogenics. Model 1020 Cold Head.

Helium compressor

Helium pipes



Cold Head



The system consists of the following components:

A cryostat with connections to the vacuum and vacuum meter, electrical connections for temperature measurement, heat and cold head at the top.

Box for electrical interconnections.

External equipment, which is a dual power supply, multimeter, high vacuum pump and vacuum gauge controller with display.

With this kit we want to simulate the working conditions of the cold head on an instrument like LIRIS.

The first step is to get a vacuum in the cryostat of the order of 5x10-5 mb using the vacuum pump. We can see the level of vacuum in the cryostat in the display Pfeiffer Single Gauge.

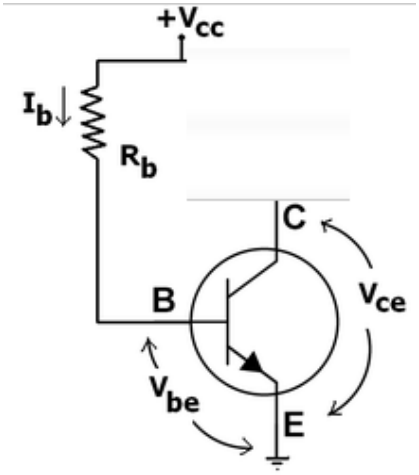
Then you can start the cryogenic pump compressor.

Through the junction box can monitor temperatures in the two stages of cryogenic pump, ST1 and ST2. Using a multimeter get values between 0.615 and 1.055 Vdc.

0.604 Vdc ----------> 16 ºC
1.025 Vdc ----------> -196 ºC (LN2)

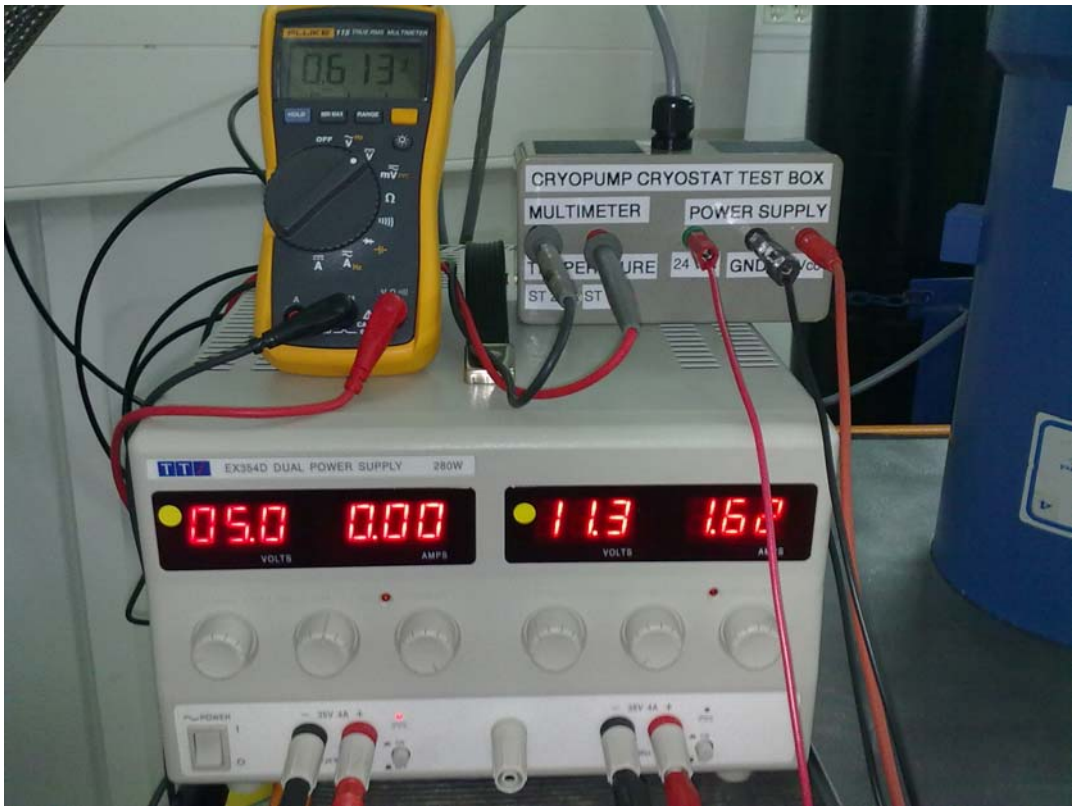
Voltage variation is -2 mV / ° C

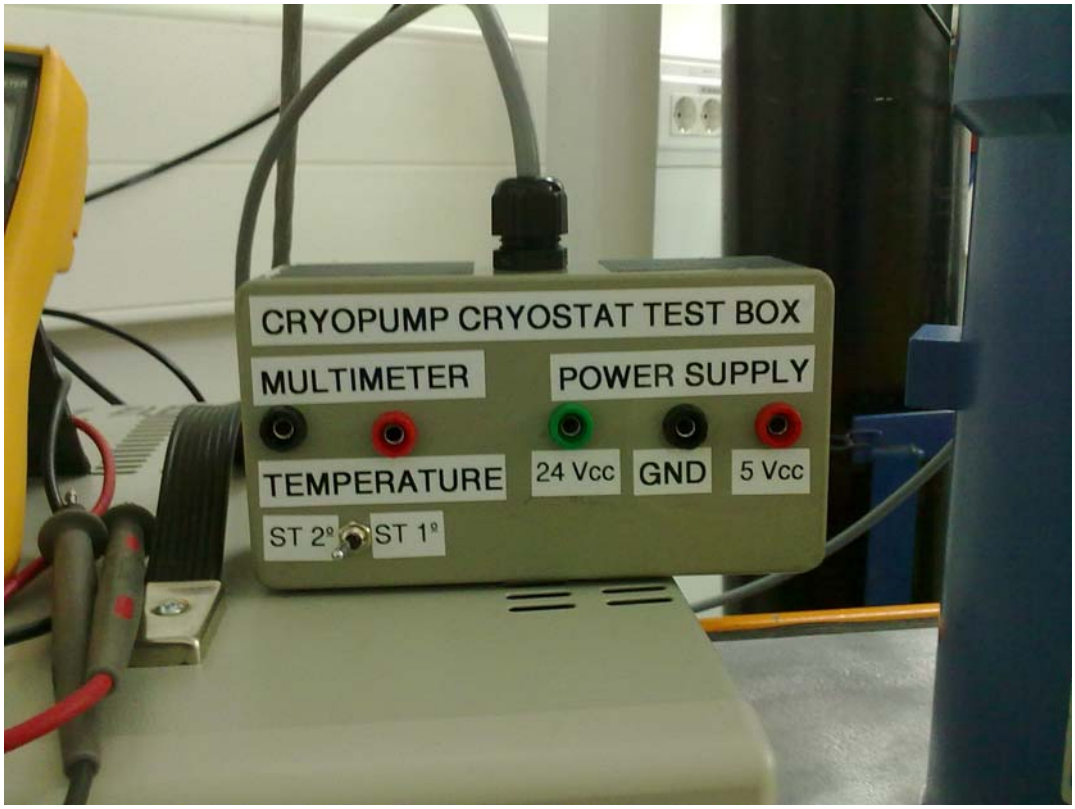
Diagrame of transistor temperature sensor.



Vcc = 5 Vcc
Rb = 4.7 K
Q1 = TIP 31 C
Vbe = VST1, VST2

We can activate an ST2 load resistor connecting the 24v power supply. The load resistance is 22 ohm and 25 w, with aluminium body and is connected in the same area as the temperature sensor ST2.





The cable from the electrical connections, is connected to the cryostat by a military 10 pins connector on one of the windows to access the interior.

Pin electrical connections

A ---------> BR ---------> GND
B ---------> RD ---------> 24 Vcc (Heater)
C ---------> OR ---------> GND
D ---------> YL ---------> VST1 (Temp ST1)
E ---------> GR ---------> GND
F ---------> BL ---------> VST2 (Temp ST2)
G ---------> N/C
H ---------> N/C
J ----------> N/C
K ----------> N/C