



PR : 1000014571

Rfx : 6100000950

### **Technical specification for Helium Reliquifier**

We intend to procure an accessory item for our existing Magnetic Properties Measurement System-XL (MPMS-XL; Ms/Quantum Design) instrument. The accessory is meant for Closed cycle helium gas re-liquefier and the boil-off gas from the instrument needs to be captured (without any impurities such as N<sub>2</sub> or O<sub>2</sub> gas) and re-liquefied again for re-use. This accessory item should not alter the major components of the existing instrument. The detailed technical requirements are given below.

#### **A. Closed cycle helium-Reliquifier for the existing MPMS-XL instrument**

Unless otherwise mentioned, all the accessory components should be compatible with the Indian voltage condition (200-240 V; 50/60 Hz).

1. The helium re-liquefier cryo-refrigeration system should be capable of liquefying the helium gas (from atmospheric pressure) at room temperature and generate a minimum of 10 Litres or more per day and the re-liquefaction and re-condensing at the rate of a minimum of 18 Litres per day without disturbing the main instrument as it is sensitive to vibration.
2. The compressors used for this liquefaction purpose either can be water-cooled or air-cooled.
3. All the connections for liquefaction lines should be made of stainless steel.
4. The entire cryo-head assembly should be rest on an adjustable, firm platform, so that the height can be adjusted as and when required.
5. The accessory should possess pressure monitoring, relief, and safety valves and be compatible with the hardware/software components of the MPMS-XL instrument.
6. The accessory should be capable of monitoring/stabilizing the temperature using appropriate sensors, heaters, and controllers.

7. The entire cryo-refrigeration technology should be powered by advanced cooling technology with high reliability and less maintenance such as Pulse Tube Cryocooler.
8. The closed-cycle helium re-liquefier should be operable 24/7 reliably, automatically, and safely.
9. The boil-off helium gas from the MPMS-XL instrument should be recovered without any other gas impurities. The recovered gas should be re-liquefied again for re-use.
10. The vendor is requested to provide the 4-5 helium gas cylinders filled with helium gas with the required purity for the installation of this accessory at the user site.
11. The vendor should offer suitable UPS (with 30% more output than the maximum power utilization expected by the instrument, with a minimum battery backup of 60 min or more) and a compatible Chiller with the offer. It should be compatible with Indian voltage (220 V/50 Hz)
12. Please list out the number of installations of this accessory all around the world in the last five years and particularly in India.

**B. Other important points :**

1. We are looking for a turn-key solution and hence the vendor is responsible for the full installation, commissioning, testing, and training.
2. The vendor must provide a detailed compliance statement with respect to each technical specification in the tender document duly supported by the manufacturer's literature or documents. Any other claim will not be accepted and may lead to the rejection of the bid.
3. Warranty: A minimum of 5 years of comprehensive warranty from the date of installation and OEM/vendor should give in writing additional 8-10 years of comprehensive maintenance support with additional charges as per the prevailing rates. Instruments that are likely to be obsolete in this time frame should not be quoted.
4. Installation and adequate Training should be carried out by qualified service engineers at the user site. The vendor must furnish the details

of the trained service engineers stationed at Mumbai to ensure quick and regular support.

5. The vendor must provide a compliance statement IN TABULAR FORM with respect to each technical specification in the tender document duly supported by the manufacturer's literature and published papers. Any other claim will not be accepted and may lead to the rejection of the bid.
6. Technical evaluation by the institute may include a demonstration to verify functionalities and capabilities of the system quoted.