

VACUUM PUMPING SYSTEM

DETAILED SPECIFICATIONS:

GENERAL REQUIREMENTS

In order to achieve the specified performance and to maintain it continuously during the research tenure, the special facilities and quality control measures should be adopted, over and above standard vacuum practices.

To minimize surface degassing (thereby, cutting down the pump down time) all the Stainless steel components and sub-assemblies should be electro-chemically polished. All the components, sub-assemblies and final unit should be leak tested at a leak range of 10×10^{-9} std.cc/Sec using a Helium Mass Spectrometer Leak Detector having a sensitivity of 6×10^{-11} std. cc/sec.

SYSTEM SPECIFICATIONS:

(A) VACUUM PUMPING SYSTEM:

ROTARY VACUUM PUMP

Rotary pump should be of make of reputed companies, direct drive Rotary vacuum pump having a displacement capacity of 333 lit/min ($24 \text{ m}^3/\text{hr}$) giving an ultimate vacuum of 1×10^{-3} m.bar under no load condition on McLeod gauge with gas ballast in fully closed condition.

DIFFSTACK OIL DIFFUSION PUMP

Oil diffusion pump should be of reputed companies make, Oil Diffusion pump having 150 mm nominal diameter (D) with an effective pumping speed of 750 lit/sec.

HIGH VACUUM VALVE

A high vacuum butterfly type valve of 6" size to provide maximum pumping capacity should be provided above the diffusion pump.

VACUUM COLLAR

A vacuum collar should be provided above the high vacuum valve and should be versatile for multiple needs of the user. The top port should be blanked off and can be connected after removing the top plate when maximum pumping speed is required. In case of a connection to a smaller opening a KF-25 side port should be provided.

PLUMBING LINES & VALVES

Plumbing lines should be made up of stainless steel incorporate 2 nos. of 1" quarter swing butterfly valves for backing and roughing operations.

An air admittance valve to release vacuum into the collar and a fine control needle valve for controlled admittance of inert gas should be provided.

SS Bellow :

1 nos. of SS vacuum compatible bellow of KF-25 should be provided extra with the pumping system for future use.

(B) VACUUM MEASURING GAUGES:

PIRANI GAUGE

The unit should be provided with an digital pirani gauge, two pirani gauge heads should be provided to independently monitor the roughing and backing pressure in the range of 0.5 to 0.001 mbar through a selector switch. It should be of reputed make.

PENNING GAUGE

A digital penning gauge, with 1 no. metal gauge head should be provided to monitor high vacuum in two ranges. First range is 1×10^{-3} to 1×10^{-5} m.bar and second range is 2×10^{-5} to 1×10^{-6} m.bar. It should be of reputed make.

SAFETY DEVICES:

A water flow switch in the water circulation line of the unit should be provided to protect the diffusion pump in case of water supply failure/low pressure by switching off the diffusion pump heater.

A Thermostat switch should be fitted to the water cooling coils of the diffusion pump to protect it from excessive heating by switching off the heater.

Over Load protection devices should be provided for the vacuum pump motor and diffusion pump.

(C) ELECTRICAL CONTROLS :

Unit should be operated on 220V A.C 50 Hz Single phase power supply.

(D) MOUNTING FRAME :

All the above components should be housed in an aesthetic MS frame with a front panel for mounting gauges and controls. The valve control knobs should be towards the front of the frame. The unit should be mounted on 4 castor wheels for easy mobility.

(E) ULTIMATE VACUUM:

The unit should be specified with the capacity of an ultimate vacuum of 3×10^{-6} m.bar in clean, cool, empty degassed condition.

(F) FREE SUPPLY:

The following materials are supplied free along with the unit:

- a) First charge of molecular distilled oil for vacuum pump.
- b) First charge of silicone oil DC-704 for diffusion pump.
- c) One set of Instruction Manual.