



Features

Pump Design: Cryogenic Vacuum Pump

Pumping Speed (l/s): 1,500 (Air)
4,000 (Water)
2,200 (Hydrogen)
1,200 (Argon)

Ultimate Pressure - Torr (mBar): 5×10^{-8} (6.6×10^{-8})

Inlet Flange: 10" CF flange

Rough Pump Connection: 25 KF

Gas Capacities – Std. Liters: 8 (Hydrogen)
1,000 (Argon)

Crossover: 150 torr-liters

Regeneration Time: 2.5 hrs (cold to cold)

Weight: 52 lbs

Compressor: Brooks 8200 compressor is used with 20' helium lines (dimensions below)

Functionality

Cryogenic pumps (commonly called cryo pumps) are gas capture pumps that immobilize gas molecules on cold surfaces within the pumps housing. Cryo pumps are comprised of three surfaces. An outer surface, which is held at 80K and includes an optically opaque chevron baffle, pumps mostly water vapor. It surrounds (and thermally insulates) an inverted cup-shaped inner surface held at 15K to 20K that traps the common atmospheric gases. The underside of the cup is coated with activated carbon and provides pumping for lighter gases such as hydrogen, helium and neon. All surfaces are cooled by a closed cycle helium cryo compressor attached to the pump by insulated tubes. Cryo pumps are particularly suited to pumping atmospheric gases and high melting point vapors (H₂O) in the 10⁻⁶ to 10⁻¹⁰ Torr range. The major disadvantages are poor helium pumping, vibration transmitted from the compressor and regeneration required.

This mechanism is less susceptible to operational errors than other high vacuum pumps. If exposed to the chamber when the quantity of gas (Pressure x Volume) exceeds the manufacturer's recommended number, the pump simply warms, temporarily losing its ability to pump. After the gas load is reduced and the pump cooled, it is again operational.

Cryo pumps have found great success in non-aggressive semiconductor processes where oil-free operation and high pumping speeds are essential.

Benefits

- High Pumping Speeds for pumping vapors (water vapors)
 - High Throughput
 - Very Clean
 - Low Operating Cost
 - Fail-Safe when mis-operated
- **Where Used:** PRO Line PVD 75
 - **Recommended Applications:** Thermal, Sputtering, E-Beam
 - **Recommended Maintenance:** Regenerating the cryo pump must be considered on a routine basis (process dependent)
 - **Installation Considerations:** Compressor location is typically within twenty feet. Additional lengths of cryogenic lines are available.
 - **Non-Compatibility:** These pumps are not suitable for corrosive gases.

