OPERATING INSTRUCTIONS FOR THE JANIS RESEARCH SUPERTRAN-VP CRYOSTAT SYSTEM

INTRODUCTION

The Janis Research Company's SuperTran-VP continuous flow cryostat combines a flexible transfer line with a cryostat to provide quick refrigeration from below 2 K to 300 K. Liquid helium is continuously transferred through a vacuum jacketed, superinsulated flexible transfer line to a vaporizer/heat exchanger at the bottom of the sample chamber. The liquid is then vaporized and heated to some specified temperature, and travels upwards to cool the sample and intercept the heat loads coming down the sample tube. A needle valve located at the bottom of the leg (which goes inside a storage dewar), controls the cryogen flow to the sample mount.

Temperatures below 4.2 K arc achieved by reducing the pressure (using a mechanical vacuum pump) at the sample tube vent/pumping port. Temperatures above 4.2 K are obtained by sending an appropriate current through a bifilarly wound heater at the vaporizer. This heater, as well as any control thermometer supplied will be wired to an electrical feedthrough at the top of the cryostat vacuum jacket. An optional top loading sample positioner/sample mount assembly, containing an additional heater may be supplied with the system. The heater on this sample mount may be used for additional control.

UNPACKING AND SET-UP

After removal of the protective padding and shipping supports, the cryostat can be visually inspected for any damage incurred during shipment. Please report any visible damage to the crate or cryostat to your shipping/receiving department, and to Janis Research as soon as it is
noticed.

Four tapped holes (usually 1/4-20) are provided with standard systems, at the bottom of the vacuum jacket for rigid attachment to a laboratory bench. The cryostat head can also be supported by a standard laboratory stand and clamp(s) assembly, while the SuperTran leg may be supported inside the storage dewar.

PREPARATION FOR COOLDOWN

The SuperTran-VP is shipped with the transfer line vacuum space and the cryostat vacuum space evacuated. This is a result of the final testing at the factory, and it helps ensure clean vacuum spaces. As a precaution against deterioration of the vacuum, which arises sometimes during transit or a prolonged storage period, both vacuum spaces should be re-evacuated prior to use. This is best done with a good pumping station (e.g., a turbomolecular pumping station) capable of bringing the ultimate pressure down to approximately 10* Torr. Refer to the enclosed engineering drawing for the location of the evacuation (bellow sealed) valves. After evacuation, all valves should be firmly closed, but care should be exercised to avoid damaging the seat with too much pressure.

The vacuum jackets are protected against cold leaks with a pressure relief valve, which will vent any pressure that exceeds 2 to 4 psig. The transfer line pressure relief is located opposite the evacuation valve, while the shroud pressure relief is located on top of the cryostat vacuum jacket.