

Cryogenic Systems for Neutron Studies



HE-3-TLSV-NEUTRON

Cryogenic systems for neutron scattering have a number of very specific requirements that are unique to this application. Neutron systems typically have a thin-walled neutron zone surrounding the sample area. This neutron zone is most commonly made of aluminum, but may also be vanadium if required. It is an advantage to have these walls as far away from the sample as possible, and for them to be as thin as possible, in order to minimize interaction of the neutrons with the cryostat. Janis cryostats for neutron scattering all feature this type of thin-walled neutron zone, with specific details tailored to fit the needs of the user. Since these systems are all built to order, the design can easily be altered to meet local dimensional standards.

Janis supplies both closed cycle and liquid helium cooled systems for neutron scattering, including top loading He-3 systems (He-3-TLSV, shown top left), helium cooled variable temperature cryostats (SVT-400T-XG, shown bottom left), 4 K closed cycle refrigerator systems (SHI-4T and SHI-950T, shown page 2), 10 K closed cycle refrigerator systems (CCS-250 and CCS-950T), and 4 K pulse tube-cooled systems (PT-950T).

The sample environment can either be vacuum or static exchange gas. Top loading static exchange gas systems offer advantages to a user facility because samples can be changed quickly and easily, and because samples with poor thermal conductivity can be cooled effectively.

A wide temperature range is often of interest. Janis has built systems for operation to temperatures as low as 300 mK. Other cryostats have been built with a temperature range as broad as 5 K - 800 K.



SVT-400T-XG

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*SHI-950T for
Neutron Scattering*

Systems can be designed with detachable tails (including cold tails with indium-sealed joints), allowing tail sets to be exchanged for different experimental configurations. We have supplied one facility with multiple SHI-950T style cryostats that have interchangeable tail sets for maximum flexibility. Each unit has a standard base cooling module with standard tail interface, and the tail sets are tailored to a specific experiment.

Some systems are self-supporting on a base plate that can be bolted to a goniometer, allowing the cryostat to be tilted by a few degrees. Other systems have a long tail that reaches down into a neutron well, or into the bore of a magnet.

Whatever the experimental need, Janis applications engineers can work with the researcher to provide a customized solution, beginning with an extensive range of proven designs.

For more information, please visit our web site at <http://www.janis.com/NeutronStudies.aspx>.



SHI-4T

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