Closed-cycle System Cryostat Quick View

Lake Shore CRYOTRONICS

environment by JANIS

■ = Sample-in-vacuum

■ = Sample-in-exchange-gas

CCS-100 <4 K to 325 K

General purpose cryostat

CCS-XG <4 K to 325 K

Low-vibration cryostat

CCS-800 <4.5 K to 300 K

Mössbauer spectroscopy cryostat

CCS-300S <4 K to 325 K

Subcompact, optical cryostat

CCS-XG-UHV <4 K to 325 K

Low-vibration, bakeable, ultra-high vacuum cryostat

CCS-900 <4 K to 800 K

Optical cryostat

CCS-300ST <4 K to 325 K

Subcompact, non-optical cryostat (alternative mounting shown)

CCS-TRAP <5 K to 500 K

Noble gas trapping cryostat

CCS-900T <4 K to 800 K

Non-optical cryostat

CCS-400 <4 K to 500 K

Optical, high-temperature (500 K) cryostat

CCS-400H <5 K to 800 K

Optical, high-temperature (800 K) cryostat

SHI-950-LT 1.5 K to 800 K

Low-temperature optical cryostat

SHI-950T-LT 1.5 K to 800 K

Low-temperature non-optical cryostat

Closed-cycle System Cryostat Applications

Model	Environment	Sample type = all (non-conductive, conductive, solid, liquid, powder)	Sample type = only conductive, solid	Rotatable sample	Maximum temperature >325 K	Fast and easy sample change <10 min	Low vibration 40 nm	UHV	Mössbauer	Optoelectronics	Magnetotransport	Noble gas trapping	Electrical transport	Quantum computing
		Sample environment							Typical applications					
CCS-100	Vacuum		✓							✓			✓	
CCS-300S	Vacuum		✓							✓	✓		✓	
CCS-300ST	Vacuum		✓								✓		✓	
CCS-400	Vacuum		✓		✓					✓			✓	
CCS-400H	Vacuum		✓		✓					✓			✓	
CCS-XG	Vacuum		✓				✓			✓			✓	
CCS-XG-UHV	Vacuum		✓				✓	✓						✓
CCS-TRAP	Vacuum				✓							✓		
CCS-800	Exchange gas	✓		✓		✓			✓					
CCS-900	Exchange gas	✓		✓	✓	✓				✓			✓	
CCS-900T	Exchange gas	✓		✓	✓	✓							✓	
SHI-950-LT	Exchange gas	✓		✓	✓	✓				✓			✓	
SHI-950T-LT	Exchange gas	✓		✓	✓	✓							✓	✓

Typical applications

Mössbauer spectroscopy studies low energy gamma rays emitted and absorbed to understand the properties of a solid materials nuclear structure. A Mössbauer spectrometer attaches to the cryostat to excite and take measurements of the material being studied.

Optoelectronics studies electronic devices that interact with light, such as light-emitting diodes (LEDs), solar cells, and photodetectors. These optical components are cooled to reduce thermal noise and increase sensitivity to observe the components' interaction between light and electrical signals. This is especially important in low-light applications, where even small amounts of noise can affect the accuracy of the measurements.

Magnetotransport studies materials in the presence of a magnetic field. The transport properties of charge carriers, such as their mobility and concentration, can be investigated using techniques such as magnetoresistance and Hall measurements.

Noble gas trapping refers to the adsorption of noble gases, including helium, neon, argon, krypton and xenon. The extraction of such gases from geological materials collected from volcanic hot springs provides insight into the planetary evolution of the Earth.

Electrical transport is a technique used to study the electrical properties of materials. This can include measurements of electrical resistance, conductivity, and other properties that are important for understanding the behavior of materials in various electronic and magnetic devices.

Some approaches to **quantum computing** require cryogenic temperatures. A UHV sample environment is needed for ion trap devices, as is extremely low vibration. With other approaches, fast sample exchange is useful for pre-screening devices.