Cryogenic Micro Probe Station

The cryogenic magnetic field probe station is designed for non-destructive and flexible testing. This cryogenic magnetic field probe station provides a level of 6000Gs magnetic field, and can easily achieve magnetic field reversal through bipolar power control. The user can also select the horizontal vector magnetic field and the vertical magnetic field.

The cryogenic magnetic field probe station uses a 4K or 10K closed cycle refrigerator, and the corresponding sample station temperature is lower than 7K and 13K. The primary refrigeration platform of the refrigerator cools the radiation screen and the supporting connection part, and the secondary refrigeration platform cools the sample stage and the probe.

This system consists of a coated aluminum vacuum chamber, gold-plated oxygen-free copper radiation shield, gold-plated oxygen-free copper sample stage, etc. All parts in the vacuum are cleaned, which is conducive to forming a better vacuum environment. Prevent contamination of the tested sample.

Application

- Magnetic characteristics test
- Microwave characteristics test
- DC, RF characteristic test
- Micro-electronic mechanical system
- Superconductivity test
- The optoelectronic properties of nanocircuits
- Quantum dots and wires
- Other non-destructive tests

Configuration

- Closed cycle refrigerator
- Helium compressor
- High pressure helium pipe (2 pieces, 6 meters)
- The surface is sprayed with aluminum vacuum chamber, 4 (optional) micro-motion probe consoles are installed on the anodized table top, and stainless steel welding spray paint support frame
- Horizontal magnetic field electromagnet, magnetic field 0.6T
- High precision bipolar power supply
- Polished gold-plated oxygen-free copper radiation shield
- 50mm diameter gold-plated oxygen-free copper sample stage
- Three-stage vibration reduction system to ensure the vibration of the sample table <1 micron
- DC, microwave, or light probe
- 4 temperature sensors and two heaters to ensure accurate temperature control and temperature monitoring
- Crycon 24C low temperature temperature controller
- Gauss meter and low temperature Hall probe
- High magnification electron microscope, resolution 2 microns, 24-inch LCD display

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Temperature range

4K-400K	
Temperature stability	Full temperature zone is better than 0.1K
*The bare refrigerating machine is not equipped with heaters and any test equipment, only the lowest temperature that the temperature sensor can reach	

Vacuum chamber	**Anti-radiation screen**
Material	Oxygen-free copper
Length	
Width	
Number of probes	10 (10um)
Cover	Low temperature cold window with sapphire movable
Installation platform	Primary refrigeration platform
Window material	Sapphire
Clear diameter	35mm

Sample table

Grounded sample stage	40mm diameter standard sample stage
Electrical insulation sample stage	diameter 40mm, optional
Coaxial sample stage	40mm diameter BNC connector Coaxial to sample
Triaxial sample stage	40mm diameter Triaxial connector Coaxial or triaxial line to sample
Accept any form of sample table customization	

Magnetic field

Magnet	Special Electromagnet for Probe Station
Magnetic field direction	Horizontal
Magnetic induction intensity	Greater than 6000Gs
Polar diameter	
Polar distance	
Water flow	2L/min，2-3Kg/cm^2
Power supply	Bipolar power supply Current ±10A Voltage 100V
Gauss meter	Lakeshore 475
Hall probe	Lakeshore HGCT-3020

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Probe Translation Stage

Drive	Manual (optional electric)
X-axis movement range (axial)	50mm standard
y-axis movement range (horizontal)	25mm standard
Z-axis movement range (vertical)	15mm standard
Minimum scale	10 microns
Sensitivity	5 microns

Vibration level

Vibration of the sample table	<1 micron
Damping system	3
Primary vibration reduction	Low frequency vibration reduction Air cushion shock absorbing feet reduce low frequency strong vibration
Secondary vibration reduction	High frequency vibration reduction Vibration damping rubber isolation pad reduces high frequency and low intensity vibration
Three-stage vibration reduction	Sample stage vibration reduction Flexible oxygen-free copper braid connects the sample stage and the secondary refrigeration platform

Cooling time and vacuum time

Evacuation time (＜1Pa)	
4 liters mechanical pump	~30minutes
600 molecular pump	~8 minutes
Cooling time (room temperature to lowest temperature)	~120-150 minutes
Note: The pump-down time is related to the mechanical pump molecular pump model and performance. The above list is for reference only, and the actual situation prevails. The cooling time is related to the sample load, vacuum degree, ambient temperature, etc., and the actual cooling time is the main one.	

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Temperature sensor and temperature control

Temperature sensor	Silicon diode and Cernox
DXT-670	Installed on the radiation shield
DXC-1030	Installed on the sample stage mounting bracket to control the temperature of the sample stage
DXT-670	Installed on the secondary refrigeration platform of the refrigerator
DXC-1030	Installed on the sample stage to accurately control the temperature of the sample stage
Heater	
50W single-head heater	Installed at the bottom of the sample stage, the temperature of the sample stage is controlled
There are 2 50W single-head heaters	Installed on the anti-radiation screen, and the 100W heating power auxiliary system quickly heats up

GSG microwave probe

40GHz	Option
Connector type	K type
Cable	Semi-rigid
Frequency	0-40GHz
Tip material	Tungsten, beryllium copper
Tip distance	50-2500 microns
50GHz	Option
Connector type	2.4 type
Cable	Semi-rigid
Frequency	0-50GHz
Tip material	Tungsten,beryllium copper
Tip distance	50-1250 microns
67GHz	Option
Connector type	1.85 type
Cable	Semi-rigid
Frequency	0-67GHz
Tip material	Tungsten,beryllium copper
Tip distance	50-1250 microns
Note: All GSG high frequency probes include translation stage, tip thermal anchor, ±5° rotation	

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Light interface

Wavelength range	Ultraviolet-visible light or visible light-infrared
Connector	SMA
Optical fiber specification	100-400 microns
Type	Single core or multi core
Optical fiber material	Polyimide sheath, fused silica core

DC low frequency probe

Coaxial cable	Standard
Connector	SMA or BNC
Frequency	0-100MHz
Impedance	50 Ohm
Triaxial cable	Optional
Connector	Triaxial connector
Frequency	0-100MHz
Impedance	50 Ohm
Tip material	Tungsten (standard), tungsten gold-plated (optional), beryllium copper (optional)
Tip diameter	0.5 microns (standard), other diameters are also available

Electron microscope

Zoom	16:1
Sensor	1/2” CMOS
Field of view	12.8mm-0.8mm
Working distance	89mm
Light	Ring or coaxial
Resolution	2 microns
Bracket	Boom
Display	24” LCD

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