SIMTRUM

Electrical Probe Temperature Stage / Station

2022 V1

For customized projects please Contact us:

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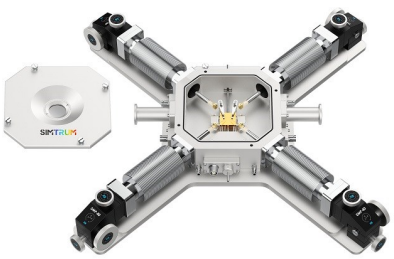
The Electrical Probe Temperature Stage is a product designed to characterize the temperature dependence of electrical properties during the heating and cooling phases of materials research.

Based on the optical temperature stage, an electrical module has been added. By moving the needle pin during testing, the tip of the needle can be brought into contact with any area of the sample surface. The electrical signal is transmitted to the instrumentation for electrical testing through the wiring connected to the needle holder, and the electrical properties of the material at variable temperatures are analyzed.

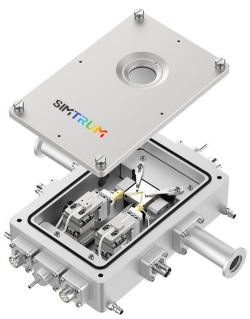
Fixed Probe Pin

Magnet Micro Probe Pin

Fixed Probe Pin + Magnet Probe Pin



Manual Adjustable Probe Pin Station



Motorized Nanoscale Probe Pin

Features

- Temperature range: -190 to 600℃, temperature control accuracy ±0.1℃
- Gas-tight chamber can pass protective gas
- Upgradeable vacuum chamber (10^{-3} mbar)
- Step up and down the temperature, 0-60 ℃/min ;
- Supports multi-probe testing (up to 8)
- Upgradable Triax BNC
- Support on-demand customization

Chamber Type

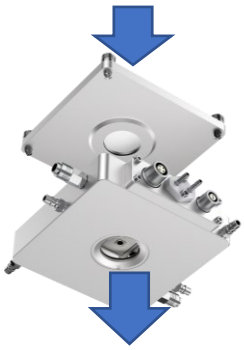
Gas-tight
Protective gas can be passed through

Vacuum
Pumps up to 10^{-3}mbar

Light Transmission Mode

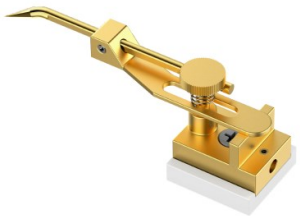
Reflection Mode

Stage

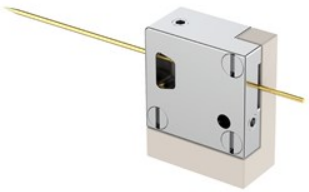


Transmission Mode

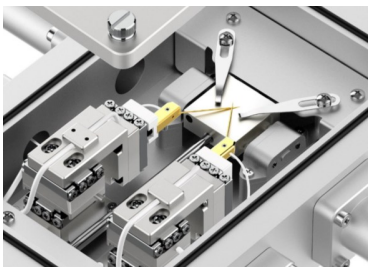
Probe Types



Fixed Probe Pin

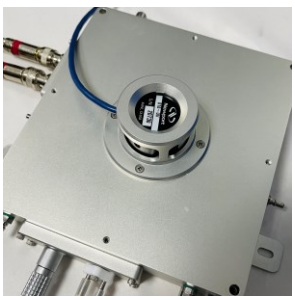


Magnetic Probe Pin

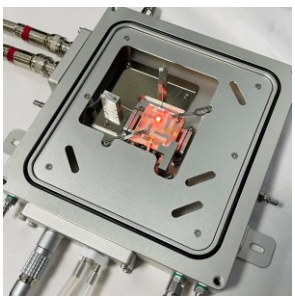


Motorized Nano Scale Probe Pin

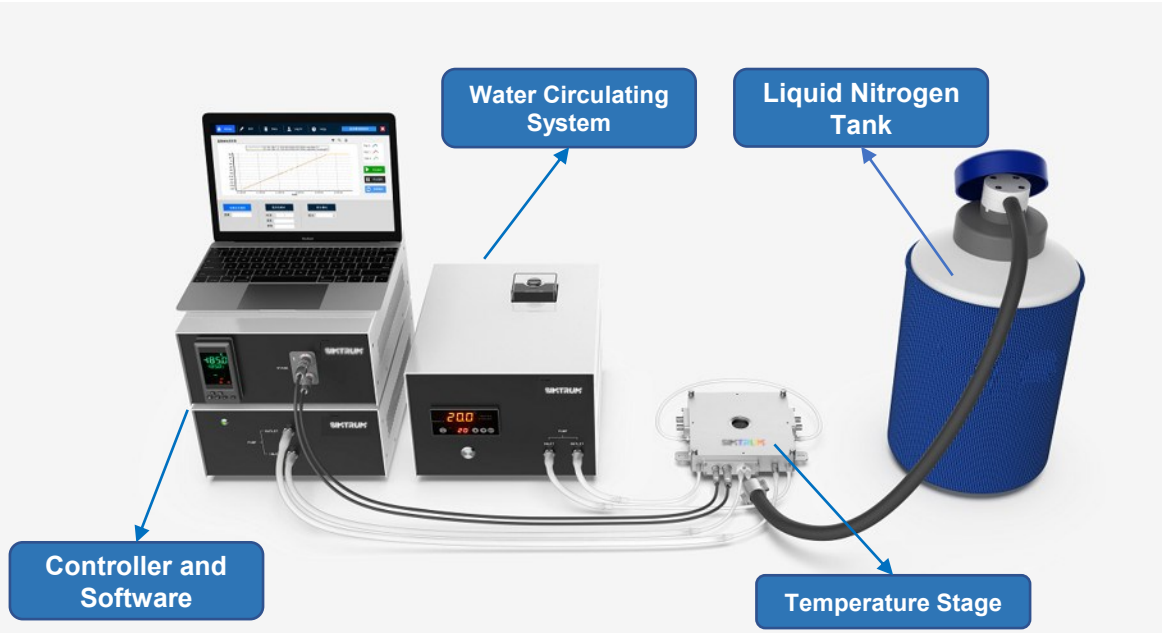
Customized Optical Interface



Customized Chamber



Temperature Control System



Liquid Nitrogen Consumption

1) The maximum liquid nitrogen consumption is 1L/h, maintained at -190 ℃ ;

2) Normal use 0.5L/h, high and low temperature changes.

Water Cooling System

Water circulating system (temperature control)

The water circulation system is needed for Ultra-low or High-temperature environments. It attaches to the Temperature stage chamber

- For low temperatures application down to -190 degrees it will prevent water condensation to the stage and chamber
- For high-Temperature application it will cool the chamber wall to room temperature for safety

Specifications

Optical Indicators	Fixed Probe Pin / Magnet probe Pin / Fixed Probe Pin + Magnet probe Pin
Temperature Control	
Cooling & Heating	Liquid nitrogen cooling, resistance heating
Temperature Control Range*	-190 to 600℃
Temperature Stability*	±0.2 °C (< -170 °C), ±0.1°C (< 600°C)
Temperature Resolution	0.1 ℃
Temperature Control Speed	0~50℃/ min (can be fixed point / program segment temperature control)
Temperature Control Method	PID
Temperature Sensor	PT100
Optical Properties	
Optical Path*	Reflected light path (can be upgraded to transmitted optical path)
Window Material*	Quartz glass
Window Size*	Φ25mm
Lens Working Distance*	10mm, 8mm, or 5mm
Light-transmitting Hole*	No light-transmitting hole by default (can be upgradable with light-transmitting hole)
Window Defrosting	Air blowing defrost at negative temperature
Electrical Characteristics	
Probe*	4 Fix probe pin or 4 magnetic probe pin
Probe Interface*	BNC interface x4
Sample Table Potential*	Electrical floating (optional electrical grounding)
Structural Properties	
Sample Table Size*	23×23mm
Sample Carrier Material*	Silver
Dimensions*	160×150×30mm
Sample Cavity Height*	8.5mm or 7.5mm
Chamber*	Gas-tight (can be upgradable vacuum)
Shell Cooling	Recycled water
Remark	Above are all default parameters, with * can be customizable

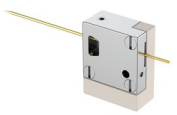
Temperature Range Choice

Low Temperature Stage: -190 to 600℃
Low temperature optional ☑ -190℃ ☐ -180℃ ☐ -160℃ ☐ -120℃ ☐ -100℃ ☐ RT
High temperature optional ☐ 400℃ ☐ 600℃

Fixed Probe Pin

Magnet Micro Probe Pin

Fixed Probe Pin + Magnet probe Pin



Magnetic Probe

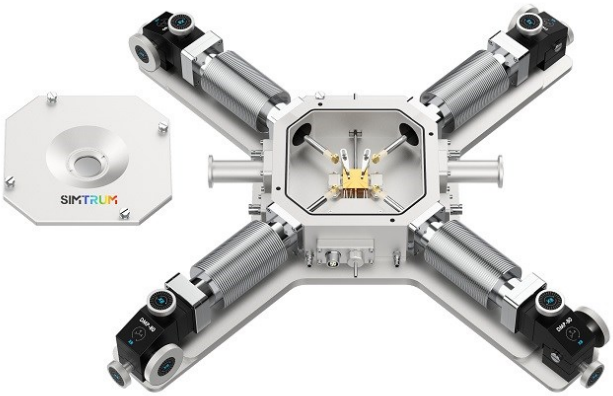
Fixed probe

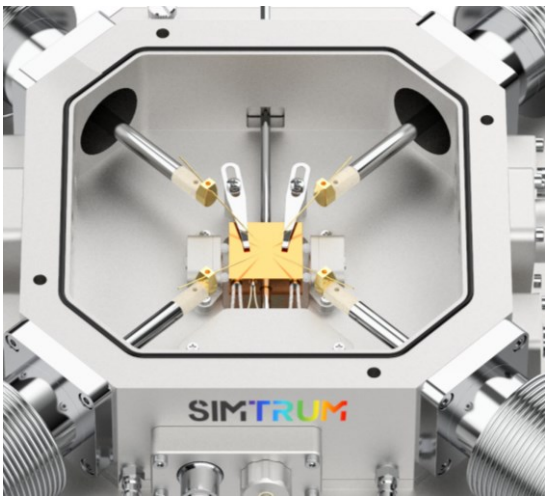
Specifications

Optical Indicators	Manual Adjustable Probe Pin Station
Temperature Control	
Cooling & Heating	Liquid nitrogen cooling, heating wire heating
Temperature Control Range*	-190 to 600 ℃
Temperature Control Accuracy	Stability ±0.1℃ , resolution 0.1 ℃
Temperature Control Speed	Max 60℃/min
Temperature Control Method	High precision PID control
Optical Properties	
Optical Path*	Reflected optical path (can be upgraded to transmitted optical path)
Window Size	φ25mm (subject to actual size)
Lens Working Distance	16.5mm
Window Defrosting	Air blowing defrost at negative temperature
Electrical Characteristics	
Probe*	Adjustable probe *4 (gold-plated tungsten steel)
Probe Interface*	BNC connector (optional triaxial interface)
Sample Table Potential*	Electrical floating (optional electrical grounding)
Structural Properties	
Sample Carrier Material*	Copper (can be customizable Silver)
Sample Table Size	23x23mm (subject to actual size)
Dimensions	150*150*55mm (excluding adjustment table)
Sample Cavity Height	15mm (subject to actual size)
XYZ Displacement Stroke	±6mm
Probe Displacement Accuracy	5μm
Remark	Above are all default parameters, with * can be customizable

Temperature Range Choice

Low Temperature Stage: -190 to 600℃
Low temperature optional ☑ -190℃ ☐ -180℃ ☐ -160℃ ☐ -120℃ ☐ -100℃ ☐ RT
High temperature optional ☐ 400℃ ☐ 600℃



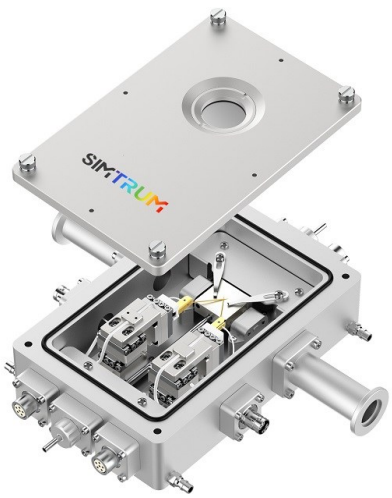


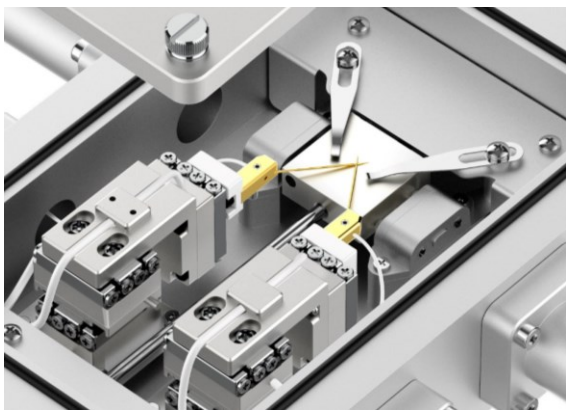
Specifications

Optical Indicators	Motorized Nanoscale Probe Pin
Temperature Control	
Cooling & Heating	Liquid nitrogen cooling, heating wire heating
Temperature Control Range*	-190 to 600 ℃
Temperature Control Accuracy	Stability ±0.1℃ , resolution 0.1 ℃
Temperature Control Speed	Max 60℃/min
Temperature Control Method	High precision PID control
Optical Properties	
Optical Path*	Reflected optical path (can be upgraded to transmitted optical path)
Window Size	φ25mm (subject to actual size)
Lens Working Distance	12.5mm
Window Defrosting	Air blowing defrost pipeline at negative temperature
Electrical Characteristics	
Probe*	Gold-plated tungsten steel probe *2 (upgradable 4 probes)
Probe Interface*	BNC connector (optional triaxial interface)
Sample Table Potential*	Electrical floating (optional electrical grounding)
Structural Properties	
Sample Carrier Material	Silver
Sample Table Size	23x23mm (subject to actual size)
Dimensions	110x170x15mm (excluding adjustment table)
Sample Cavity Height	10.5mm (subject to actual size)
XYZ Displacement Stroke	±6mm
Probe Displacement Accuracy	1nm
Remark	Above are all default parameters, with * can be customizable

Temperature Range Choice

Low Temperature Stage: -190 to 600℃
Low temperature optional ☑ -190℃ ☐ -180℃ ☐ -160℃ ☐ -120℃ ☐ -100℃ ☐ RT
High temperature optional ☐ 400℃ ☐ 600℃





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