

## DESCRIPTION

The **HCP421V-MPS** Micro Probing Station is designed for applications where both thermal and atmospheric control is critical. With XYZ remote positioning, this thermal probing station allows electrical testing at ease without compromising atmospheric control. The low-vacuum/gas tight chamber creates a closed environment to eliminate oxidation, aid in humidity studies, or conserve expensive reacting gases. Additionally, this stage is large enough to accommodate a variety of samples, including wafers from 10mm to 50mm.



## KEY FEATURES

### System Integration

Integrates with modern instruments with small footprint tabletop design

### Rapid Heating Rates

+100°C per minute max rate

### Micro XYZ Remote Positioning

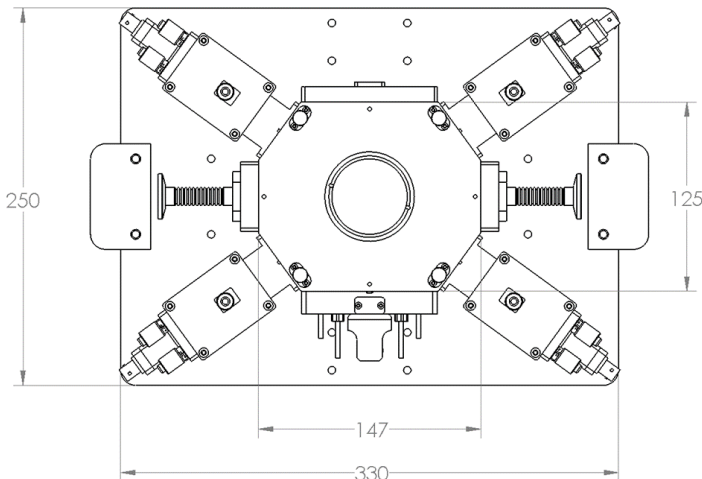
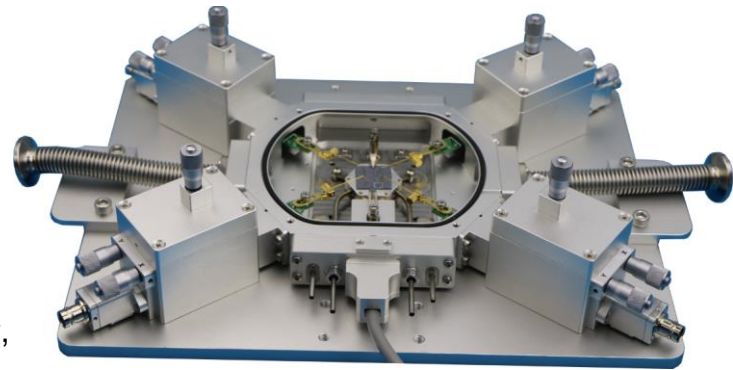
Position sample at ease without having to remove the top cover. Provides greater flexibility, sample area accessibility, and precision temperature control without compromising atmospheric control.

### Vacuum/Gas Tight Chamber

Allows gas purging for defrosting as well as prevents condensation and oxidation. Also allows for a controlled atmosphere around the sample. Features quick connect and release gas ports or KF vacuum ports.

### Accuracy and Stability

A pt100 platinum RTD sensor is embedded into the sample heating and cooling block to guarantee high temperature accuracy and stability. The RTD sensor is calibrated to measure the surface temperature of the sample heating block – giving the closest and most accurate reading of the sample possible.



### Additional Features

- Includes standalone **mK2000** temperature controller
- Includes 'InstecApp' Windows compatible software for optional operation via PC
- Comes standard with optical glass windows that can be easily replaced with IR or UV transparent glass.

## THERMAL SPECIFICATIONS

Temperature Control	<i>mK2000</i> with programmable precision LVDC switching PID method
Thermal Block	Silver
Sample Thermal Cover	Optional removable Inner sample cover with additional window
Temperature Minimum	-190°C (with optional liquid N2 cooling)
Temperature Maximum	400°C (600°C option available)
Temperature Sensor	100 Ω Platinum RTD
Temperature Resolution	0.01°C (RTD)
Temperature Stability	±0.05°C (>25°C), ±0.1°C (<25°C)
Power supply	Universal power input
Software	Windows software to record and export temperature-time data

## OPTICAL SPECIFICATIONS

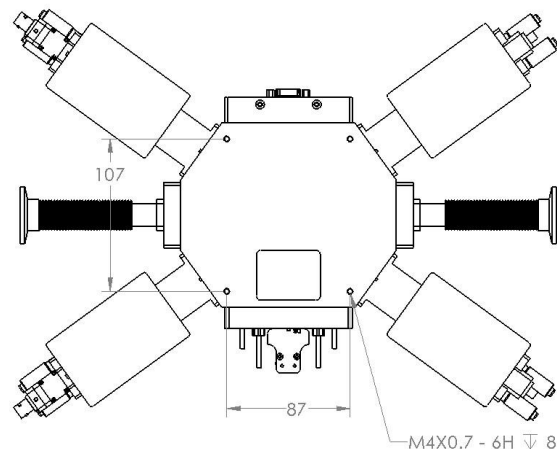
Optical access	Reflection (custom transmission option available)
Optical windows	Removable and exchangeable windows permit full-spectrum transparency
Minimum Objective Working Distance	12 mm
Top Window	Ø50mm
Top Viewing Angle	±50.0° from normal
Window Defrost	Integrated external window defrost

## STRUCTURAL SPECIFICATIONS

Sample Area	Fits Ø10mm – Ø50mm wafers and devices
Chamber Height	8.0mm
Atmosphere Control	Gas tight chamber with purge to control humidity, condensation, and oxidation
Frame Cooling	Integrated frame cooling channels (optional chillers available)
Frame Dimensions	300 mm x 300 mm x 40 mm
Weight	4000 g

## ELECTRICAL FEATURES

Electrical Probes	Tungsten-rhenium DC probes (other options available)
Probe Positioning	XYZ micro positioners with 10um resolution
Connectors	Coaxial BNC (default), or triaxial BNC
Sample Surface	Grounded (default), floating, or triaxial



## OPTIONS



### Active Sample Cooling

Achieve below ambient temperatures and/or controlled sample cooling with **LN2-P** cooling accessory; includes tubing and dewar (3L, 10L, or 30L). Enables active cooling with rates of up to  $-50^{\circ}\text{C}$  per minute (at  $100^{\circ}\text{C}$ ).



### Frame Cooling

Safety always comes first – keep the frame of the thermal stage cool and safe to touch with an optional water circulator (see **C100W** chiller). Frame cooling option allows thermal control of the frame independent of the sample thermal block and aids in preventing frost buildup when the sample is being cooled below freezing temperatures.



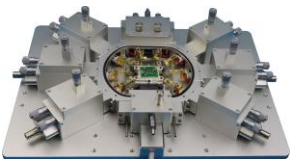
### Spacer Set

Increase chamber height with fitted **spacer kit and custom cover lid** to allow fitment of taller samples, while maintaining the gas tight capability with the top cover.



### Inner Cover

The chamber height is the distance between the top surface of the thermal block and the bottom surface of the outer cover. With an optional inner cover, the distance is minimized in design to allow for just enough space for intended samples (slides, slipcovers, wafer pieces, etc.). By closing the distance, the vertical temperature gradients are also significantly reduced.



### Electrical Probers

Add up to 3 probers for a total of 7 XYZ probers for remote mechanical positioning.



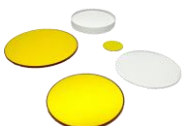
### Microscope

Stereo microscope or tube microscope offering superior performance for a variety of research applications with specifications to satisfy a wide range of demanding observational requirements. (see **TPM310-TR**)



### Camera

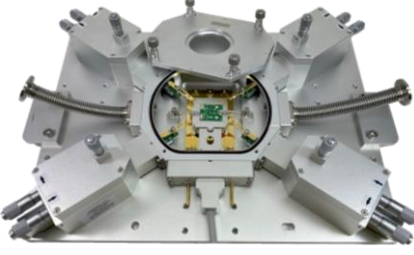
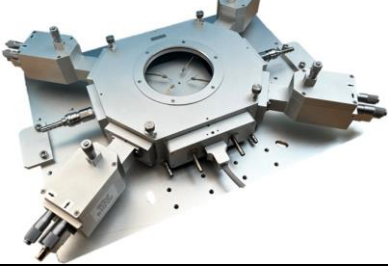

Integrate digital image acquisition with sample temperature overlay. Includes software (WinDV2 via InstecApp), USB 2.0 connection, 1.92-megapixel resolution, and standard C-mount microscope connection. (see **MITO2**)



### Windows

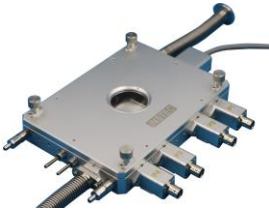
Additional or alternate available windows are Sapphire, BaF2, CaF2, ZnSe (see **HCS601GXY-IRM** for IR applications).

## SIMILAR PRODUCTS

	TP102V-MPS	HCP402SV-MPS	HP1000V-MPS
			
<b>Temperature Range</b>	-25°C to 150°C	-190°C to 400°C	RT to 1000°C
<b>Sample Cooling</b>	Water*	LN2	-
<b>Sample Area</b>	40mm x 40mm	50mm x 50mm	25mm x 25mm

\*water base cooling of thermoelectric heating and cooling module

## Other products to consider....



**HCP421V-PM** mini probe stage with 28mm x 28mm sample area. Temperature range -190°C to 400°C. Low-vacuum tight chamber with gas purge capabilities. Probes not movable with cover lid on. Option to add electrical feedthroughs.



**TP102V-PM** thermoelectric mini probe stage with 40mm x 40mm sample area. Temperature Range -25°C to 150°C. Low-vacuum tight chamber with gas purge capabilities. Probes not movable with cover lid on. Option to add electrical feedthroughs..



**HP1000V-PM** high-temperature mini probe stage with 16mm x 16mm sample area. Temperature range ambient to 1000°C (heating only). Low-vacuum tight chamber with gas purge capabilities. Probes not movable with cover lid on. Option to add electrical feedthroughs.



**HCP621G-PMH** hall effect measurement stage with 28mm x 28mm sample area. Temperature range -190°C to 400°C. Low-vacuum tight chamber with gas purge capabilities. Probes not movable with cover lid on. Option to add electrical feedthroughs.