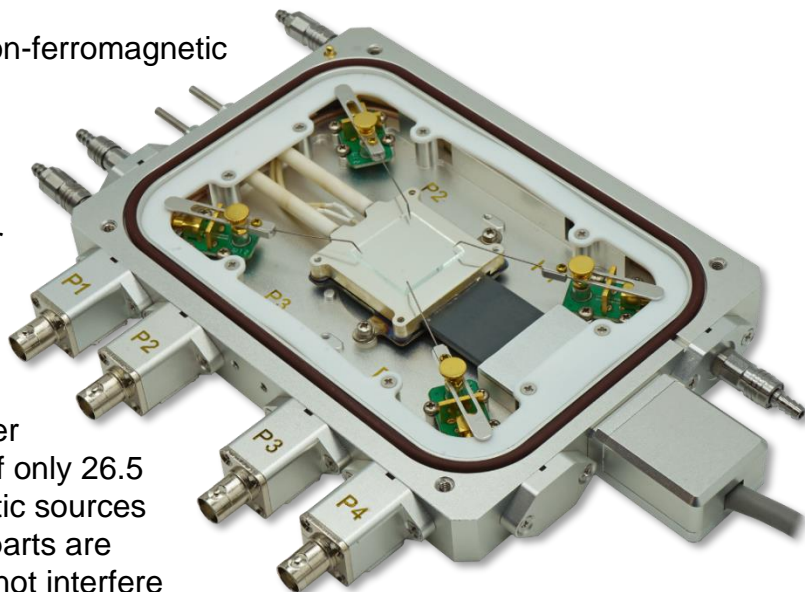


### DESCRIPTION

The **HCP621G-PMH** hot & cold plate is made with non-ferromagnetic materials and designed for Hall effect measurements where both thermal and atmospheric control are critical. Using a silver heating and cooling block, this stage provides a wide temperature range with exceptional thermal uniformity. The gastight chamber provides a closed environment to prevent condensation, provide defrosting, prevent sample oxidation, or to control humidity. This heating and cooling stage has 4 independent electrical probes with manual positioning, ideal for electrical pads larger than 600um x 600um. The chassis has a thickness of only 26.5 mm, allowing for compatibility with a range of magnetic sources for inducing Hall effect voltages. Non-paramagnetic parts are used within a 50mm radius of the sample area as to not interfere with magnetic field application.



### FEATURES

#### Wide Temperature Range

-190°C to 600°C (with optional **LN2 cooling accessory**)

#### Low Electrical Noise

The controller uses programmable precision LVDC PID method to minimize electrical noise.

#### Electrical Probes with Manual Positioning

Manual cantilever probes can be independently positioned to any point of the sample area before sealing chamber.

#### Gas Tight Chamber

Sealed chamber allows for inert gas purging or defrosting to prevent condensation and oxidation. The sealed chamber can also be used to control the atmosphere around the sample for humidity studies or hostile environment testing. Features quick connect gas ports and replaceable rubber seals.



#### Accuracy and Stability

A pt100 platinum RTD sensor is embedded into the thermal block to guarantee high temperature accuracy and stability. The RTD sensor is calibrated to measure the temperature of the surface of the sample heating block – giving the closest and most accurate reading of sample possible. Additional sensor options are available, and alternative sensor types such as thermistors are also available.

#### Additional Features

- Includes standalone **mK2000** temperature controller
- Includes 'InstecApp' Windows compatible software for optional operation via PC

### THERMAL SPECIFICATIONS

Temperature Control	<i>mK2000</i> with programmable precision LVDC PID method to minimize electrical noise
Thermal Block	Silver
Temperature Minimum	-190°C (with optional liquid N2 cooling)
Temperature Maximum	600°C
Temperature Sensor	100 Ω Platinum RTD
Maximum Heating Rate	+50°C per minute at 100°C (faster rates available by request)
Maximum Cooling Rate	-50°C per minute at 100°C
Minimum Heating and Cooling Rate	±0.01°C per minute
Temperature Resolution	0.01°C
Temperature Stability	±0.05°C (>25°C), ±0.1°C (<25°C)
Power supply	Universal power input – 250W max (not including optional LN2 cooling system or water-cooling accessory)
Software	Windows 10/11 software to record and export temperature-time data

### OPTICAL SPECIFICATIONS

Optical access	Reflection capability (ask about <i>HCS621G-PMH</i> for transmission)
Optical windows	Removable and exchangeable windows permit full-spectrum transparency
Minimum Objective Working Distance	8.5 mm
Top Window	Ø18 mm aperture, with Ø22 mm window (options for Ø28 mm or Ø38 mm)
Top Viewing Angle	±45° from normal
Window Defrost	External window defrost

### STRUCTURAL SPECIFICATIONS

Sample Area	38 mm x 42 mm. Non-magnetic construction within 50mm of sample area center.
Inner Chamber Height	6.3 mm
Atmosphere Control	Gas tight chamber with purge to control humidity, condensation, and oxidation. Supports up to +0.5 Bar, or 1mbar rough vacuum for accelerating gas purge.
Frame Cooling	Integrated frame cooling with optional chiller system
Mounting	Base model includes tapped holes on frame and removable side-mounted L-Brackets. Horizontal and vertical mounting adaptors available for select instruments, or by custom design
Frame Dimensions	180mm x 130 mm x 26.5 mm
Weight	1500 g

### ELECTRICAL SPECIFICATIONS

Electrical Probers	Four (4) or Six (6) DC to 500 MHz electrical probes (200V /1A max) - Prober material options such as tungsten-rhenium, beryllium-copper, or other materials - 25um or 5um tip radius options - Additional standalone electrical feedthroughs available by request
Probe Positioning	Manual cantilever probes independently positioned to any point of the sample area before sealing chamber. Ideal for pad sizes larger than 600 um x 600 um* <i>*Smaller pad sizes require -MP or -MPS models</i>
Connectors	Coaxial BNC connectors for HCP621G-PMH base-model  Floating, triaxial or SMA connectors available with HCP621G-PMH+ model
Sample Surface	Electrically grounded sample area* <i>(*Floating or triaxial options for back-biasing available with HCP621G-PMH+ customizable model)</i>

### OPTIONS

#### Active Cooling

Conduct low-temperature experiments down to  $-190^{\circ}\text{C}$  with **LN2-P** cooling accessory; includes tubing and Dewar (2L, 10L, or 30L). Enables active cooling with rates of up to  $-50^{\circ}\text{C}$  per minute (at  $100^{\circ}\text{C}$ ).



#### Frame Cooling

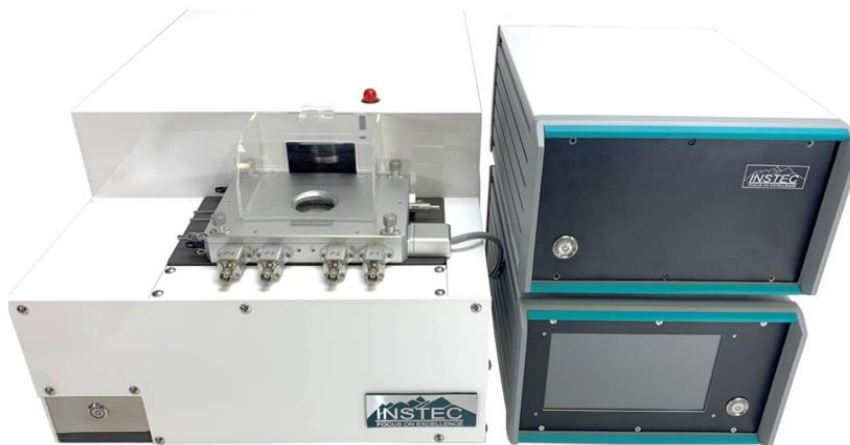
Safety always comes first – keep the frame of the **HCP621G-PMH** cool and safe to touch with an optional water circulator. (see **C100W** chiller) Frame cooling option allows thermal control of frame independent of sample and aids in preventing frost buildup when cooling sample below  $0^{\circ}\text{C}$ .

#### Electrical Feedthroughs

Add up to 8 electrical feedthroughs for applying electric field to sample with HCP621G-PMH+ model. Coaxial BNC, Triaxial BNC and SMA options are available.

#### Hall Effect Measurement System

Hall effect measurement tool fully compatible with **HCP621G-PMH** stage, including SM200 source-meter. Strong neodymium magnets with motorized magnet polarity switching create uniform magnetic field over sample area. Measure temperature dependent properties of a wide range of semiconductor materials.



#### Vacuum Tight Chamber Version

Sealed chamber can be either gas purged or evacuated to protect sensitive samples from moisture and oxygen as well as to study vacuum processes such as freeze drying. (see **HCP421V-PMH** for vacuum compatible model).

#### Mounting Adapter

Various mounting adapters are available for most microscope models and/or instruments. Custom mounting adapter may also be made to fit each and every application.

#### Transmission Aperture & Windows

Add an aperture for transmitted light. Quartz, Sapphire, BaF<sub>2</sub>, CaF<sub>2</sub>, ZnSe windows available