

DESCRIPTION

The **HCS321Gi** hot and cold stage is designed specifically for inverted optical microscopes. Its small form factor allows for easy mounting onto nearly all common inverted microscope platforms. The HCS321Gi offers the widest temperature range available for inverted microscope applications and a fully enclosed sample chamber for enhanced temperature uniformity and inert gas purge.



KEY FEATURES

Wide Temperature Range

-190°C to 300°C (with optional [LN2 cooling accessory](#))

Gas-tight Chamber

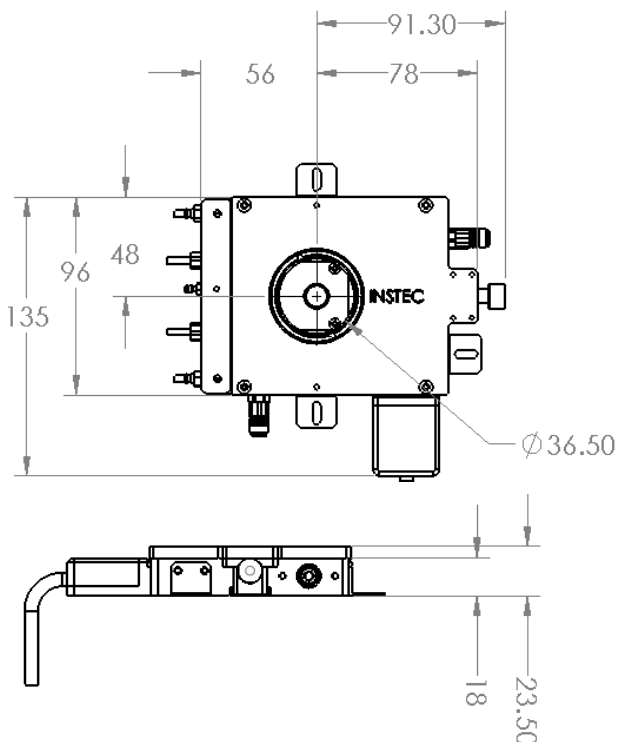
Sealed chamber allows for positive pressure gas purge up to 0.5Bar and very rough evacuation down to 1mBar. Apply a dry-inert gas purge to prevent condensation while cooling, or to prevent oxidation while heating. Humidity control is also possible with Instec's RHC01 humidity controller (available by request).

Removable Inner lid

The removable inner lid greatly improves temperature uniformity, and provides a convenient method for securing samples. Either secure the sample with some insulated Kapton tape, or install some spacer material beneath the inner lid to sandwich the sample onto the thermal block, which is then mechanically held in place by the inner lid.

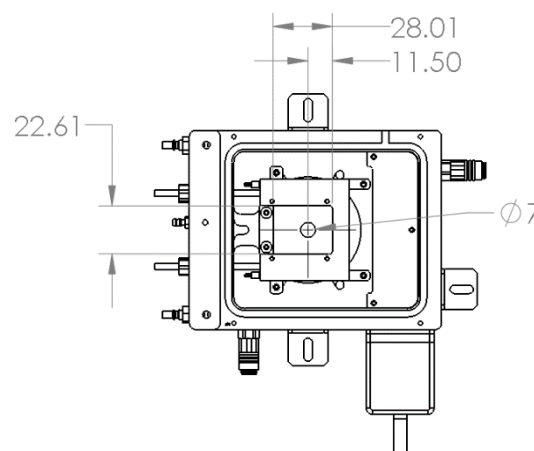
Accuracy and Stability

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 area – giving the closest and most accurate reading the sample temperature possible. Additional sensor options and alternative sensor types, such as a thermistors, are available upon request



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

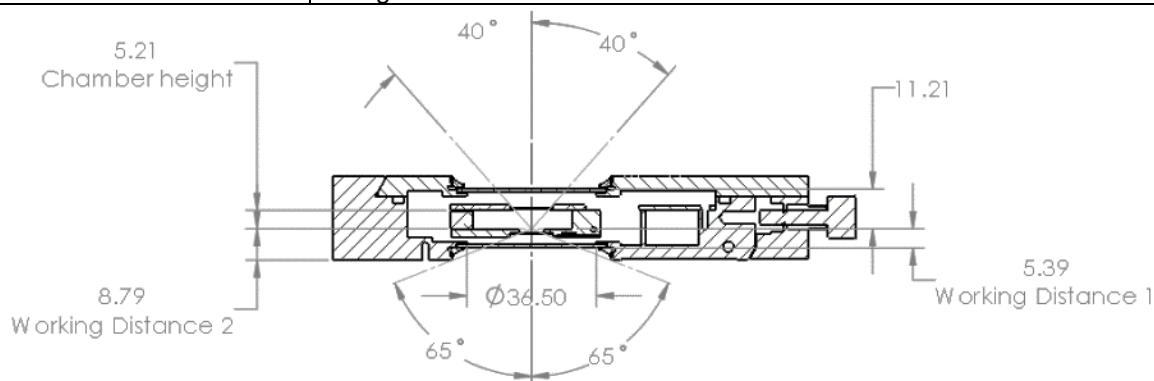
Temperature Control	mK2000 with programmable switching PID output
Thermal Block	Clear anodized aluminum
Sample Thermal Cover	Removable inner cover with additional window
Minimum Temperature	-60°C with optional LN2 cooling system (-190°C available with upgraded LN2 cooling system)
Maximum Temperature	300°C (optional upgrade for 120°C available)
Temperature Sensor	100 Ω Platinum RTD
Maximum Heating Rate	+50°C per minute at 37°C
Maximum Cooling Rate	-30°C per minute at 37°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
Software	Windows 10/11 software to record and export temperature-time data

OPTICAL SPECIFICATIONS

Optical access	Reflection and transmission capability via transmission aperture
Optical Windows	Removable and exchangeable windows permit full-spectrum transparency
Minimum Objective Working Distance	5.8 mm
Minimum Condenser Working Distance	11.5 mm
Top Window	Ø36mm aperture (Ø 72mm x 1mm glass)
Top Viewing Angle	±40° from normal
Inner Lid Viewing Aperture	Ø20mm aperture (Ø 25mm x 0.2mm glass)
Inner Window Aperture	Ø 10mm inner window aperture, Ø 12mm glass
Transmission Aperture	Ø12 mm (Ø5 mm aperture for better temperature uniformity available)
Top Viewing Angle	±31° from normal
Bottom Window	Ø38.5mm aperture (Ø 40mm x 1mm glass)
Bottom Viewing Angle	±65° from normal
Window Defrost	External top-window defrost fixture, Integrated bottom-window defrost port

STRUCTURAL SPECIFICATIONS

Sample Area	23mm x 28mm x 5.2mm
Environmental control	Sealed chamber for positive pressure gas purge up to 0.5Bar, very rough vacuum down to 1mBar
Chamber Height	12 mm with removable inner cover, 20mm without removable inner cover
Frame cooling	Integrated frame cooling with optional chiller system, recommended when heating above 150°C
Mounting	Horizontal and vertical mounting capability. Base model includes tapped holes on frame and removable side-mounted L-Brackets. Vertical and Horizontal mounting adaptors available for select instruments, or by custom design
Frame Dimensions	135mm x 134mm x 23.5 mm
Weight	610 g



OPTIONS



Microscope

Entry-level polarizing microscope offering superior performance for a variety of research applications with specifications to satisfy a wide range of demanding observational requirements. (see [TPM-CX40](#)).

Note: the HCS321Gi is primarily intended for use with Inverted microscope, and may only be used with the TPM-CX40 in a limited capacity



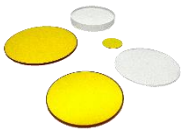
Microscope Camera with Temperature Overlay

Integrate digital image acquisition with sample temperature overlay. Includes software (WinDV2 via InstecApp), USB 3.0 connection, 20-megapixel resolution, and standard C-mount microscope connection. (see [MITO2](#))



Mounting Adapter

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

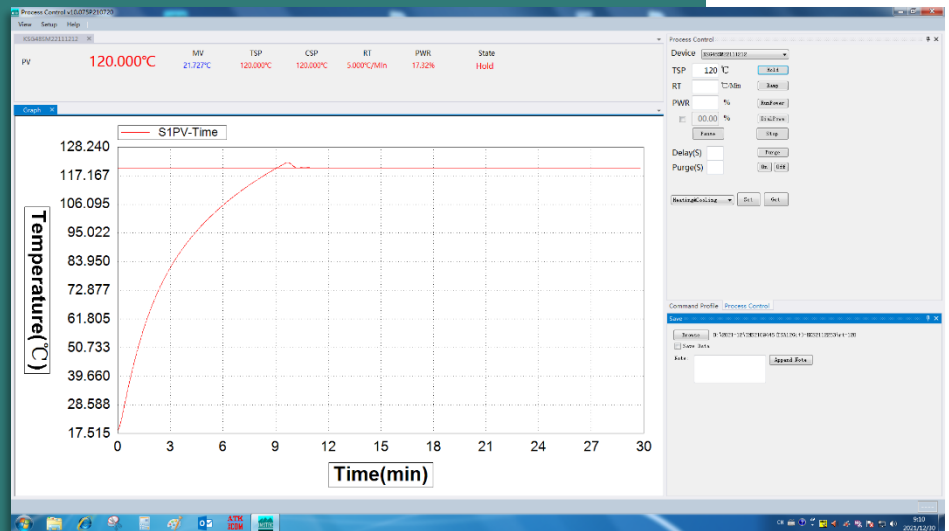


Windows




Additional or alternate windows are available, such as Sapphire, BaF2, CaF2, ZnSe

InstecApp Software

Every HCS621Gi comes with the InstecApp client software for Windows 10/11. InstecApp grants full control over the mK2000B, but also adds data logging capabilities and temperature vs. time plotting, as well as access to advanced controller parameters such as PID tuning



SIMILAR PRODUCTS

	TS102S	TS102Si	CLM77Ki	TSA12Gi
				
Temperature Range	-25°C to 120°C	-30°C to 120°C	-190°C to 150°C	-25°C to 120°C
Atmospheric Control				✓
Sample Area	45mm x 45mm	Ø35mm/ 25mm x 75mm	3x3 EM Grid	25mm x 75mm glass slides or 40mm petri dishes
Sample Cooling	TEC	TEC	LN2	TEC
Thermal Block	Aluminum	Aluminum	Aluminum	Aluminum
Objective working distance	0mm	3mm	5mm	5.5 mm

Other products to consider....



HCS621GXY heating and cooling stage with 28mm x 28mm sample area. Temperature range -190°C to 600°C. Gastight chamber with gas purge capabilities. Includes XY positioning and option to add electrical feedthroughs. Offers increased temperature range versus HCS321Gi, and also supports atmospheric control. Unlike HCS321Gi, is not designed for inverted microscopes.



HCS601G-IRM FTIR heating and cooling stage with 24mm x 24mm sample area. Temperature Range -190°C to 600°C. Gastight chamber with gas purge capabilities. CWD=10.5mm WD=10.5mm, cone angle >100°. Includes IR windows. Optimized for IR applications, and offers larger temperature range than HCS321Gi, but is not designed for inverted microscopes.



TP102G-PM heating and cooling plate with integrated electrical probers. 40mm x 40mm sample area. Temperature range -30°C to 120°C. Gastight chamber with gas purge capabilities. Perform optical analysis with simultaneous precision temperature control and electrical probing. Uses thermoelectric heating and cooling instead of LN2 + resistive heating elements. Not designed for inverted microscopes.

CONTACT A REPRESENTATIVE 