

HCS402 Dual Heater Microscope Hot & Cold Stage



Instec's HCS402 microscope hot and cold stage features a dual heater design which virtually eliminates vertical temperature gradients in the sample chamber. This makes the HCS402 temperature controlled environment an ideal choice for thicker samples or when critical temperature uniformity is necessary. The stage can be used not only for microscopy but whenever an application requires optical access to a thermally controlled sample. All of the dual windows on the HCS402 stage are removable and exchangeable allowing the HCS402 to be used for small angle X-Ray diffraction, FTIR, and other experiments requiring beam access to the sample. The stage can also be mounted vertically for applications requiring horizontal beam access to the sample chamber. The interior of the HCS402 is large enough to accommodate a variety of samples, including electro-optic devices and cell culture preparations. Standard 25 mm x 75 mm microscope slides can be directly used as sample plates. An optional thermal shielding shell is also provided to optimize thermal performance for work requiring ultra-high temperature stability and uniformity.



Hot & Cold Stages

Features

- Programmable Precision Temperature Control from -190 °C to 400 °C
- Dual Heaters Located Above and Below the Sample Chamber for Superior Temperature Uniformity
- Controlled Fast Heating and Cooling Rate
- Large Viewing Aperture
- Removable and Exchangeable Windows
- Dual Pane Windows for Better Thermal Isolation
- Integrated Aperture Window Defrost System
- Variable Sample Chamber Height
- Gas Purge Sample Chamber
- Optional Shell for Improved Sample Temperature Uniformity
- Easy Side Sample Loading with Standard Microscope Slides
- Vertical and Horizontal Mounting
- Optional Microscope Rotational Stage Mounting Accessories
- Optional Precision X-Y Micropositioner for Sample Positioning
- Optional Higher Temperature Limit Available

Technical Specifications

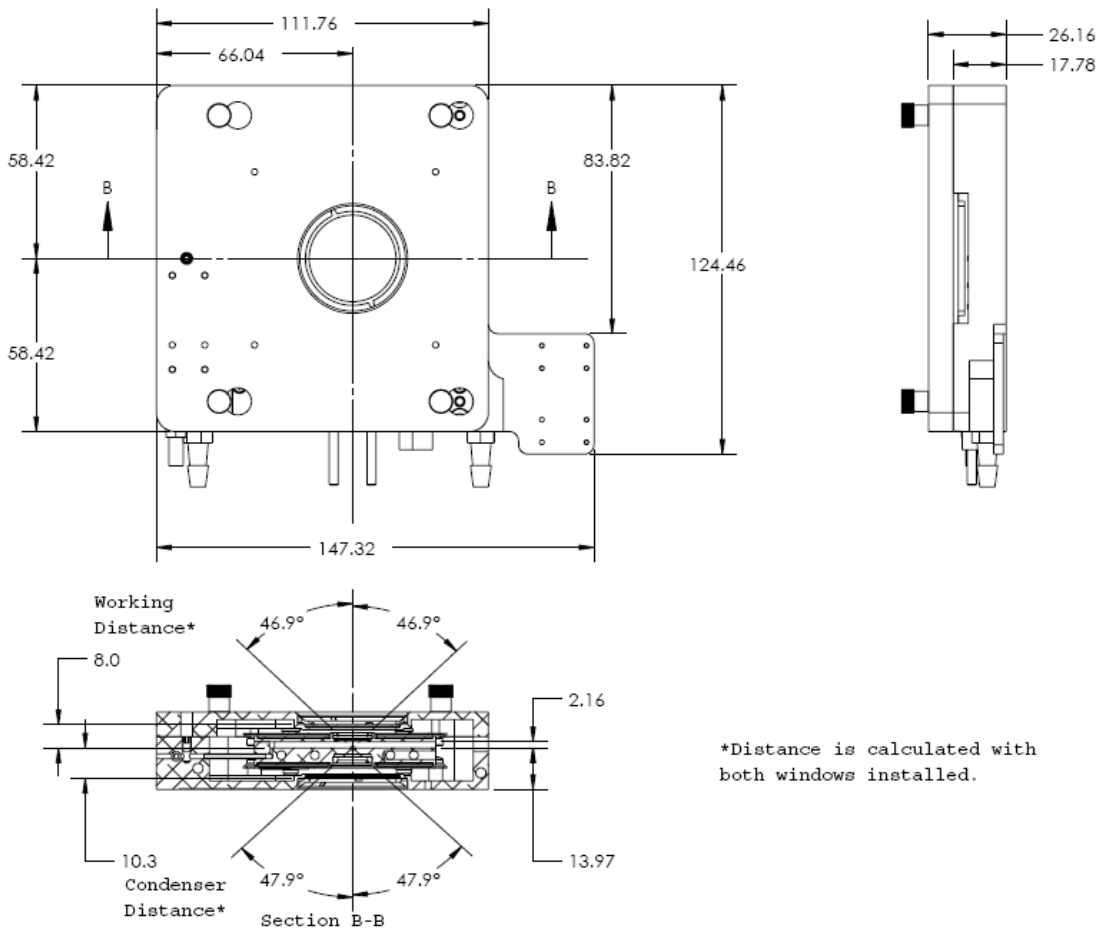
Temperature Range	-190 °C to 400 °C Optional higher temperature limit available Below ambient operation requires optional cooling accessory
Temperature Resolution	0.01 °C with mK1000
Temperature Stability	±0.01 °C at 100 °C with mK1000
Minimum Heating and Cooling Rate	±0.1 °C per hour
Maximum Heating Rate	+130 °C per minute at 100 °C
Maximum Cooling Rate	-80 °C per minute at 100 °C (when using LN2-P4)
Temperature Control Method	Switching PID
Temperature Control Sensor	100 Ω Platinum RTD
Minimum Objective Working Distance	8 mm (shorter working distance optional)
Minimum Condenser Working Distance	10.3 mm (shorter condenser distance optional)
Sample Area	38 mm x 50 mm
Chamber Height	2.0 mm (up to 12.5 mm when using optional spacers)
Sample Viewing Aperture	2 mm for transmitted light
X-Y Micropositioner (optional)	10 μm resolution

Ordering Information

Part Number	Description
HCS402-mK1000	HCS402, dual heater, hot and cold stage with mK1000, 115V/230V, software included
XY-A-01	Precision X-Y Micropositioner with sample holders and accessories, for HCS302, HCS402, HCS412W
MT-A-01	Mount adaptor for LCH-S2, LCH-S3, and LCH-S4, for use with X-Y Micropositioner
MT-A-02	Mount adaptor for LCH-S2, LCH-S3, and LCH-S4, for use without X-Y Micropositioner
SPO6-A-01	1.5 mm spacer set to increase sample chamber height, for HCS302, HCS402, HCS412W
SP12-A-01	3.0 mm spacer set to increase sample chamber height, for HCS302, HCS402, HCS412W
SP40-A-01	10.0 mm spacer set to increase sample chamber height, for HCS402

Accessories	Description
mK1000 Options	Please refer to the mK1000 Temperature Controller section for mK1000 controller options (e.g. IEEE-mK1000: IEEE 488 communication port)
LN2-SYS	Liquid nitrogen cooling accessory. Please refer to the LN2-SYS section for selections of liquid nitrogen cooling accessories
WPC3A/WPC3U	115V or 230V circulation water pump system for rapid sample chamber cooling to as low as 5°C
WP115F/WP230F	115V or 230V circulation water pump for frame cooling
MTR-SYS	Adaptor ring for microscope mounting. Contact Instec for microscope specific ring availability

Physical Dimensions & Cross Section View



*Distance is calculated with both windows installed.