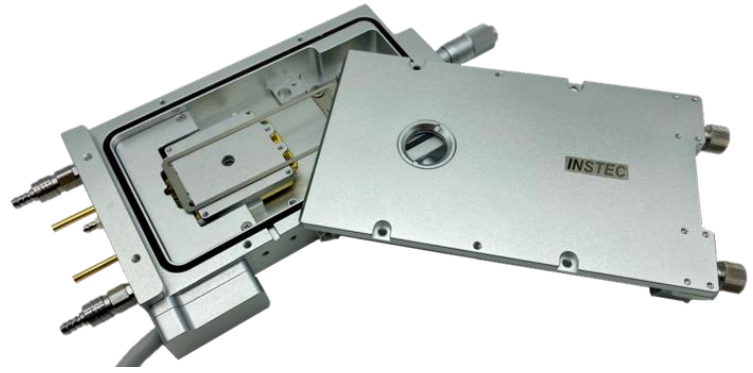


DESCRIPTION

The **TS102GXY** and **TS102VXY** Thermoelectric (TEC) based stages are specifically designed for optical microscopes and are particularly ideal for applications such as cell culture and biology. They feature a large gastight/vacuum-tight sample chamber, multiple field replaceable viewing windows, and a customizable base plate. The TS102GXY/TS102VXY is optimized for standard 25mm by 75mm microscope slides, which fit perfectly inside the XY positioner tongue. The powerful TEC module heats and cools without the need for a liquid nitrogen supply, making it especially convenient to performing long duration experiments at cold temperatures and ultimately reduces operating costs.



KEY FEATURES

Gastight or Vacuum-Tight Chamber

Inert gas-purge helps prevent condensation and oxidation, and is particularly important for sub-ambient cooling. Gas-tight chamber also allows for a controlled atmosphere around sample, such as humidity control (See RHC01). Gas-tight model features quick-connect gas ports (gas-tight model, TS102GXY).

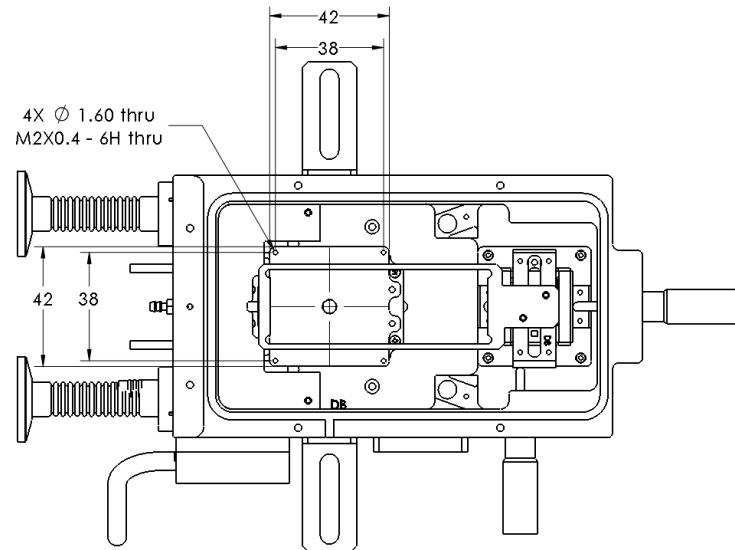
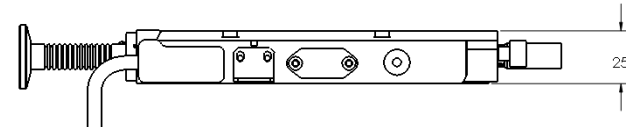
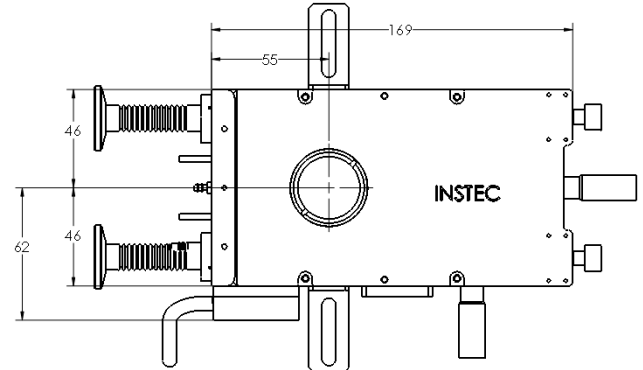
Vacuum-tight model (TS102VXY) supports inert gas-purge or evacuation down to 10uBar (HV option for 10nBar available) to protect sensitive samples from moisture and oxygen, as well as to study vacuum processes such as freeze drying. Includes 1x flexible stainless-steel bellows with KF-16 flange, and 1x vacuum blank. Secondary vacuum bellows available by request.

Thermoelectric Heating and Cooling

TEC heating and cooling provides exceptional temperature stability and range without the need for consumable coolant. Heat up to 120°C and cool down to -30°C with our standard C100W benchtop water circulator, or -40°C with an upgraded [CW5000 Chiller](#).

Exceptional 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 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

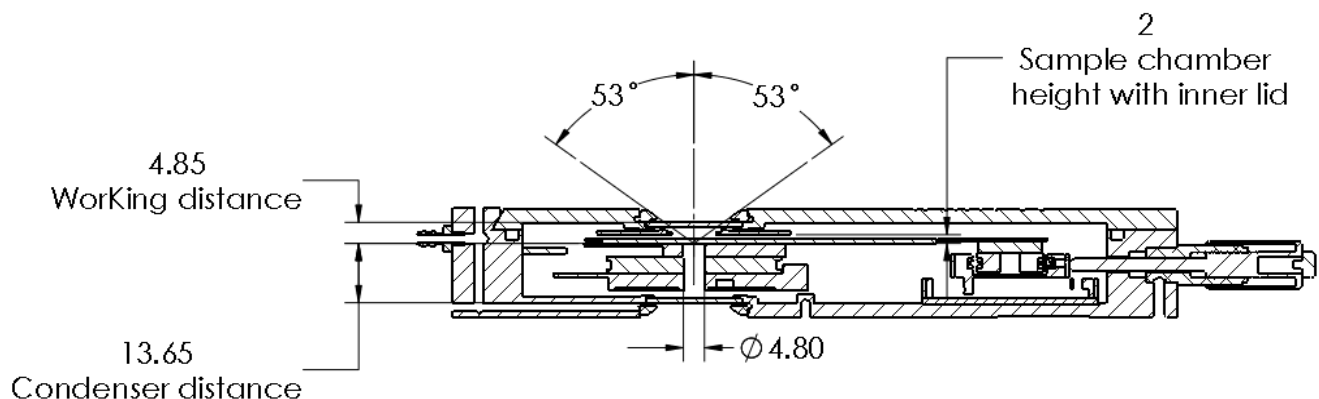
Temperature Control	<i>mK2000</i> with bidirectional LVDC output
Thermal Block	Clear anodized aluminum
Sample Thermal Cover	Removable Inner sample cover with additional window (Optional)
Minimum Temperature	-30°C w/ <i>C100W</i> -40°C w/ <i>CW5000 Chiller</i>
Maximum Temperature	120°C
Temperature Sensor	100 Ω Platinum RTD
Maximum Heating Rate	+30°C per minute at 37°C
Maximum Cooling Rate	-20°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 - 80W max (not including water cooling system)
Software	Windows software to record and export temperature-time data

STRUCTURAL SPECIFICATIONS

Sample Area	40 mm x 40 mm
Chamber Height	2.0 mm with removable inner cover 3.5mm without removable inner cover
Mounting	Horizontal
Sample Positioning	10mm fine travel w/ Vernier XY dials for remote manipulation in closed chamber Standard XY sample holder intended for use with standard 25mm x 75mm glass slides
Atmosphere Control Ports	Quick-connect gas ports (Gastight) or SS KF-16 bellows (Vacuum-tight)* <i>*1x Vacuum bellows + 1x vacuum blank included by default. Second vacuum bellows available by request</i>
Frame Dimensions	169mm x 96mm x 25mm
Weight	800g (gas-tight model), 900g (vacuum-tight model)

OPTICAL SPECIFICATIONS

Optical access	Reflection and transmission capability
Optical Windows	Removable and exchangeable windows permit full-spectrum transparency
Minimum Objective Working Distance	5.2 mm
Minimum Condenser Working Distance	14 mm
Top Window Aperture	Ø18mm (Ø22mm x 0.5mm window)
Transmission Aperture	Ø4.8 mm
Top Viewing Angle	±56° from normal
Bottom Window Aperture	Ø18mm (Ø22mm x 0.5mm window)
Bottom Viewing Angle	±13° from normal
Window Defrost	External window defroster



OPTIONS



Upgraded Chiller

Achieve lower minimum temperature with an upgraded water-cooler. The CW5000 has an internal refrigeration unit which cools down to 5°C, lowering the minimum temperature reachable by TEC systems. Chiller upgrade also requires FVC11 valve box for flow control.



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 to allow for just enough space for intended samples (slides, slipcovers, wafer pieces, etc.). By closing the distance, the vertical temperature gradients are significantly reduced, and temperature uniformity is improved.



Electrical Feedthroughs

Add up to 4 electrical feedthroughs for applying an electric field to sample.



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](#))



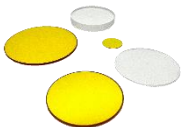
Microscope Camera with Temperature Overlay

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 available windows are Sapphire, BaF2, CaF2, ZnSe (see [TS102GXY-IRM](#) for IR applications).

SIMILAR PRODUCTS

	HCS621GXY	HCS402/HCS402XY	TS102XY	TSA12Gi
				
Temperature Range	-190°C to 600°C	-190°C to 400°C	-40 to 120°C	-25°C to 120°C
Atmospheric Control	✓			✓
Sample Area	Ø30mm	38mm x 50mm	40mm x 40mm	Ø35mm/ 24mm x 75mm
Sample Cooling	LN2	LN2	TEC	TEC
Thermal Block	Silver	Aluminum	Aluminum	Aluminum
Option to Increase Chamber Height		✓	✓	
Side Loading		✓	✓	
Sample XY	✓	✓	✓	

Other products to consider....



HCS302XY heating and cooling stage with 38mm x 50mm sample area. Temperature range -190°C to 400°C. Includes XY positioning option and is compatible with Instec LC Holders. Offers greatly increased temperature range over TS102S but requires LN2 cooling, and is not gas-tight.



TP102G Gas-tight heating and cooling plate. -30°C to 120°C without consumable coolant such as LN2. Optional inner lid for maximizing temperature uniformity. Offers gas-tight sample area to prevent condensation, but requires smaller sample sizes than the TS102GXY and does not have a transmission aperture, improving temperature uniformity for reflection-only samples.



TSA12Gi Thermoelectric heating and cooling plate for inverted optical microscopy. Gas-tight chamber supports 25mm by 75mm glass slides, or 35mm petri dishes. Temperature range -25°C to 120°C. 5.4mm minimum objective working distance, 22.8mm minimum condenser working distance. 12mm diameter transmission aperture. Offers similar performance to TS102GXY but is optimized for inverted microscopy. Requires longer working distances, and does not have an option for external sample XY positioning.

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