

# THMS600PS

Versatile Heating and Cooling Pressure Stage



## Temperature Range

< -195°C to 600°C at 1000mbar,  
-100°C to 500°C at 14bar

## Optical Techniques


Supports confocal, Raman, light  
microscopy, X-ray and more

## Variable Heating Rates

Precise control from 0.01°C  
to 150°C/min



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# Introducing the THMS600PS

The THMS600PS pressure stage has been designed to investigate the effects of pressure on a sample during heating and cooling experiments by pressurising the sample chamber at up to 14bar. It has been used in applications where minimising sample evaporation and sublimation are required.

Samples are loaded onto a 0.17mm thick cover slip or into a quartz crucible, and placed on a highly polished pure silver heating element ensuring exceptional heat transfer and extremely sensitive temperature measurement. The sample position can be precisely controlled 15mm in both X and Y directions, even under pressure. Gas pressure is applied directly to the THMS600PS using simple push-to-fit nylon pressure tubing, and an over pressure release valve is fitted to aid user safety.

Samples can be quickly characterised by heating to within a few degrees of the required temperature at a rate of up to 150°C/min, then slowed down to a few tenths of a degree per minute to closely examine sample changes.

LINK software can be used to record the entire experiment and associated images, which can then be displayed as a chart or exported for further analysis. The TASC image analysis module can be used to analyse structural changes as the sample evolves with temperature.

A system requires both the THMS600PS stage and a T96-S temperature controller, which is available with either LINK software for computer control, or a LinkPad touch screen for stand-alone control. For cooling below ambient temperatures, an optional LNP96-S liquid nitrogen pump is also available. Optional pressure gauges are also available for monitoring pressure during experiments, with the pressure value displayed on the LinkPad or within LINK.



## Features

### WIDE TEMPERATURE RANGE

The temperature range spans from  $< -195^{\circ}\text{C}$  up to  $600^{\circ}\text{C}$  at atmospheric pressure (1000mbar), and  $-100^{\circ}\text{C}$  to  $500^{\circ}\text{C}$  at 14bar. The stage body is water-cooled for work above  $300^{\circ}\text{C}$ . Optional LNP96-S required for temperatures below ambient.

### RAPID HEATING /COOLING RATES

The powerful T96-S controller allows the stage to heat samples at a maximum rate of  $150^{\circ}\text{C}/\text{minute}$ .

### HIGH DEGREE OF ACCURACY AND STABILITY

The embedded high quality Pt100 platinum sensor guarantees high accuracy and stability to  $< 0.1^{\circ}\text{C}$  throughout the temperature range.

### VARIOUS OPTICAL TECHNIQUES

Whether you need to perform Raman spectroscopy, IR or confocal, the THMS600PS can handle it.

### XY MANIPULATORS

Sample position can be controlled over 15mm of travel in both X and Y directions via the precision ground manipulators.

### CUSTOM OPTIONS

Please contact us with details of your requirements.

# Application Examples

Linkam's THMS600PS is uniquely designed to maintain a high pressure and temperature controlled sample chamber for use with a wide variety of imaging and spectroscopy techniques, across a range of applications including:

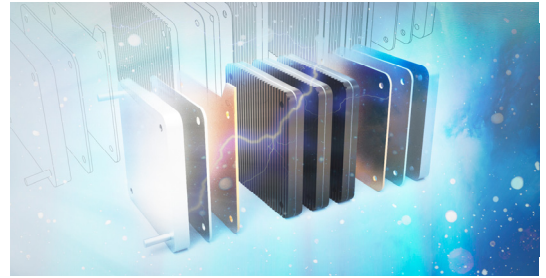
## Semiconductor and Electrical

Linkam's THMS600PS can be used across several fields using semiconducting materials, from LEDs and photovoltaic devices to energy storage and renewable energy materials.

Photovoltaics

Graphene

Perovskites



## Plastics and Polymers

The temperature and pressure dependent properties of soft materials, such as polymer composites and thermoplastics, can be characterised with the THMS600PS.

Melting Point Analysis

Surface Chemistry

Paints



## Space Research

The THMS600PS can be used to investigate how a wide range of materials withstand high pressure and temperature variations. It can be used for the testing of materials used in spacecraft, and analyse their changes using microscopic or spectroscopic techniques.

Adhesives

Joining Materials

Electronics



# Technical Specification

## Temperature Range

-100°C to 500°C at 14bar  
< -195°C (with the addition of an optional LNP96-S) to 600°C at atmospheric

## Heating Rates

0.01°C to 150°C/min

## Temperature Stability

< 0.1°C

## XY Manipulation

15mm in both directions

## Sample Area

24.5mm diameter

## Objective Lens Working Distance

8.7mm

## Compatibility

Confocal, Raman and IR.  
Clamping options are additionally available for most microscopes.



## Discover More...

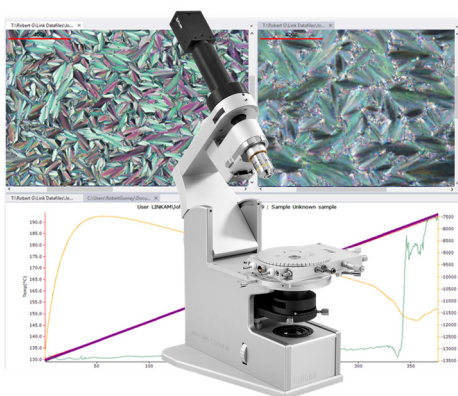


### Control Options

Take control of your experiment with LINK software, or the stand-alone LinkPad touch screen, alongside the T96 temperature controller.

Both LINK software and LinkPad share a unified user interface that can control and monitor temperature and many other parameters including vacuum, humidity, tensile and shear force (dependent on system). The LinkPad provides an easy-to-use interface to the T96, for total control without a PC. Profiles with up to 100 ramps can be programmed, allowing simulation of complex processes.

LINK software enhances this with data-logging functions and real time graphical feedback. Optional modules to enhance your system include the LINK Imaging Module for synchronised image capture, the LINK Extended Measurements module to measure key image features, the LINK 21CFR11 Module for data regulatory compliance, and LINK TASC providing image-based thermal analysis.



### Imaging Station

The Imaging Station provides a digital imaging platform compatible with Linkam temperature and environmental control systems. Use our high-resolution camera to capture images and videos of your samples while controlling the temperature and environmental conditions.

The Imaging Station has been specially designed with a pivoted mechanism to allow greater access to your Linkam stage, making it quick and easy to access the chamber and change samples. It has a built-in LED light source for transmitted light with further options available for reflected light, polarisation and phase contrast imaging.

The Imaging Station is also compatible with a range of long working distance objective lenses which can be easily switched with the quick-release mechanism.



### CCR1000

The CCR1000 Catalyst Cell Reactor is a versatile stage that has been designed to study catalytic reactions at high temperature and pressure.

The stage is designed with optical access to the reaction chamber making it ideal for use with reflected light microscopy and spectroscopic techniques including Raman and FT-IR microscopy such as Operando.

Temperature is accurately controlled by the Linkam T96-S controller (via the S-type platinum/rhodium thermocouple) which can heat samples up to an impressive 200°C/min.

## Contact Details

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We make scientific instruments that help characterise materials from polymers to biological tissue and metals to composites. Our instruments are used for research by the world's most advanced scientific organisations and companies. Each of our instruments are designed and manufactured in-house by our team of highly experienced electronics, software and mechanical design engineers. We design and develop solutions for sample characterisation by collaborating with the best scientists in the world. Will you be next?

*Linkam products are constantly being improved, hence specifications are subject to change without notice.  
TASC products are a family of techniques developed by Prof. Mike Reading (Cyversa) and Linkam.*



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