Analysa Systems - LTS420

The Analysa systems are easy to use heating and cooling systems optimised for isothermal sample analysis applications where high speed heating and cooling are compromised by larger sample area with excellent thermal stability .

Features and Benefits

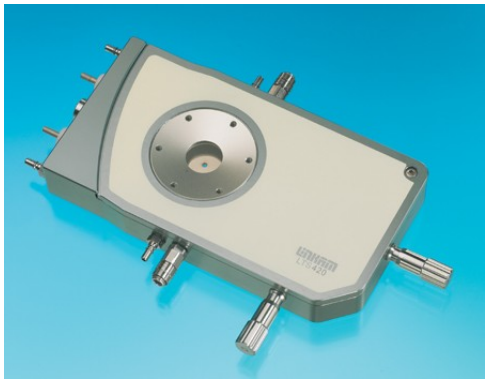
A gas tight swing out lid enables easy sample loading, utilising standard 76x26mm microscope slides.

Sample position can be precisely controlled 15mm in XY directions via the precision ground gas sealed manipulators.

Temperature is accurately controlled by a platinum temperature sensor mounted close to the surface of the heating element. Heat flow to the sample is optimised by maintaining extremely uniform heat distribution from the optically flat surface of the heating element.

Samples can be quickly characterized by heating to within a few degrees of the required temperature at a rate of up to 50°C/min with no overshoot, then slowed down to a few tenths of a degrees per minute to closely examine sample changes. The entire experiment can be saved as an online plot or exported to a spreadsheet application (when using Linksys 32X software).

The stage body is fitted with click-to-fit precision gas ports so that sample atmosphere can be controlled by gas flow and condensation eradicated by dry nitrogen purge supplied by the LNP95 cooling pump.



The LTS420 heating and freezing stage

Temperature Range –196°C to 420°C

System Options

There are two versions of the standard Analysa System. Both systems must be combined with the LNP95 cooling system if temperatures below ambient are required.

Analysa Dynamix

This system includes the excellent new standalone T95-LinkPad system controller with ergonomic LCD touch screen control and data sampling of 20 times per second. The controller has both USB and RS232 connectivity to add Linksys 32X system control software. (See the T95 system controller Product Brochure for more details).

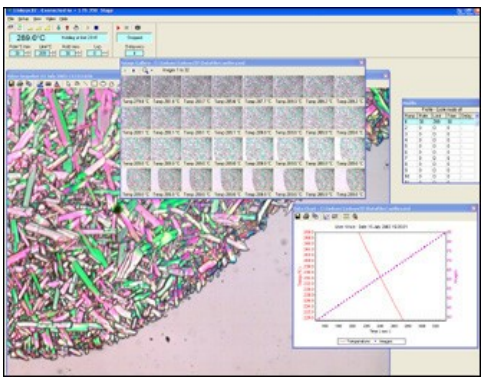
Analysa Dynamix System with LNP95 cooling system

Analysa Computer Ready

This system includes the new T95-Linksys system controller including new Linksys 32X system control software, enabling PC control of temperature, data acquisition and export as well as multiple ramp programming. (Requires PC, cannot be used as standalone controller).

Cooling

The LNP95 cooling pump communicates with the T95 system controller and varies the pump speeds to give a precise flow of liquid nitrogen from the 2L Dewar (supplied), to enable linear cooling speeds from 0.01 to 30°C/min. The exhaust dry nitrogen is then recycled through the pumps and used to keep the tubing flexible and purge the sample chamber to eradicate condensation. (All fittings and Dewar are supplied with the pump).



Linksys 32X-DV System Controller Software

Optical Specifications

The LTS420 is designed to be used with an upright microscope, where the objective lens is above the sample.

When working with heating and freezing stages, it is necessary to use long working distance objective lenses. If viewing the sample using transmitted light you also require a long working distance condenser lens.

The objective lens is isolated from the sample by the stage lid window which is a fixed distance from the heating/cooling element. In the LTS420 this distance is 6mm, as seen in the diagram opposite. We recommend that you use an objective lens with at least 6mm working distance.

The condenser lens is isolated from the sample by the stage base plate window and the thickness of the heating/cooling element. In the LTS420 this distance is 13.2mm.

Linkam make condenser extension lenses for many types of condenser, please select the 'Condenser Extension Lens' from the optical accessories section of our website.

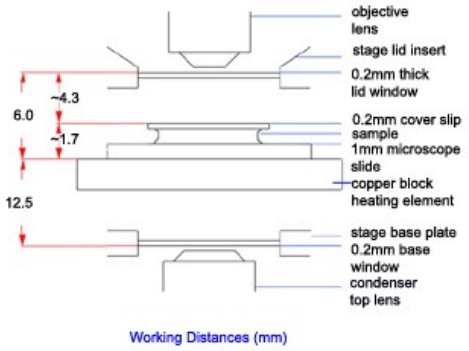


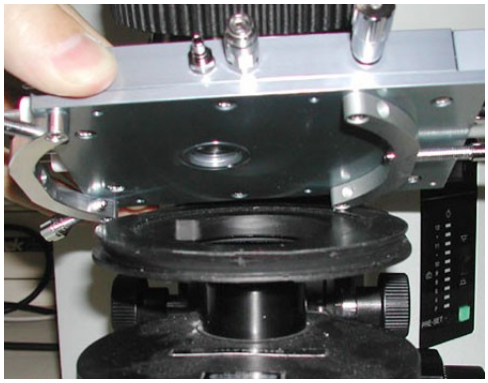
Diagram of objective lens and condenser lens working distances.

Attaching LTS420 to Microscope

Upright microscopes whether standard optical, or part of a Raman or IR system, usually have an XY table or circular POL table to move the sample relative to the objective lens. These tables are mounted to the microscope substage.

Linkam manufactures different stage clamps to attach the LTS420 stage to many different brands of microscope. The stage clamps are required to adjust the position of the hotstage relative to the light path of the objective lens.

Select the stage clamps you require from the 'Stage Clamps' section on our website.



Heating stage with stage clamps being attached to circular dovetail substage.

Increase Capability Options

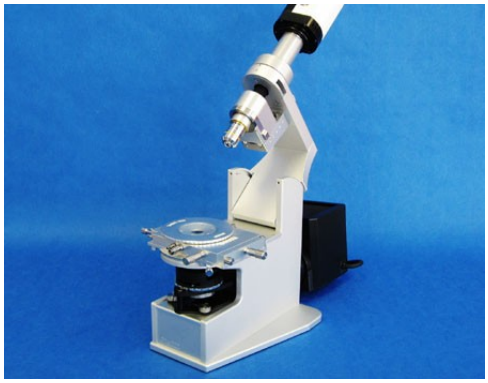
Linksys 32X-DV (Digital Image Capture) and Digital Camera

Add digital capture to the Linksys 32X system controller software and one of the range of Q-Imaging digital cameras to enable time lapse image capture including all T95 data saved with the image. Quickly find single or groups of images by dragging a box around an area of the time/temperature graph or scrolling through the gallery. Create movies of experiments and add scale bar, annotations, and measurements. (See 'Software and Image Capture' on the website for more information).

Imaging Station

Free up time on your research microscope by attaching your LTS420 stage to the Linkam Imaging Station instead. The imaging station has been designed specifically for temperature controlled microscopy. Standard microscope lens can be loaded into the quick lock mounting jaws which can be easily swung back out of the way of the stage to allow greater sample access to the LTS420 stage.

A long working distance condenser is built into the base with polarizer and diaphragm. A 100W halogen light source and C-mount for a camera is also supplied. (See 'Imaging Station' on our website for more information).



Linkam Imaging Station. Optics are tilted back to allow easy access to sample

Specifications

- Temperature Range -196°C to 420°C
- Sample area of 53.5x43mm
- 32 Ramp temperature profile programming
- 15mm XY manipulation as standard
- Sample holder for standard 76x26mm microscope slides
- Gas tight chamber for atmospheric control
- Swing out lid for easy sample loading
- Can be used with transmitted or reflected light
- Mounts directly to microscope table or substage
- Stage body size: 160x80x24mm
- 100 Ohm platinum sensor
- Temperature stability <0.1°C
- Inner lid to increase temperature stability
- Direct injection of coolant into block
- Highly conductive metal for improved heat transfer
- Maximum heating rate of 50°C/min
- Response time of <1 second at 5°C/min at 50°C
- Objective lens minimum working distance: 6mm
- Condenser lens minimum working distance: 13.2mm

Linkam Complete Temperature Control Solution

What do you need for a complete solution

Select System

Either: Analysa Dynamix (includes LTS420 stage and T95-LinkPad standalone system controller)

Or: Analysa Computer Ready (includes LTS420 and T95-Linksys controller and Linksys 32X system controller software)

Add Cooling Option to extend range from Ambient to -196°C

LNP95 (includes tubing, 2L Dewar and siphon)

Add Condenser Extension Lens if using transmitted light

See website 'Condenser Extension Lenses'

Add Stage Clamp to mount to microscope substage

See website 'Stage Clamps'

Add System Control Software (Not necessary if Examina Computer Ready is selected).

Linksys 32X

Add System Control software including the Digital Video Capture Option

Linksys 32X-DV

Add Q-Imaging Camera

See Website 'QImaging Cameras'

Add Linkam Imaging Station

Alternative to be used in place of your existing microscope for temperature controlled microscopy. See website 'Imaging Station'.

Suggested Spares

These spares are organised into convenient kits. Purchase a spares kit to avoid downtime with your stage and eliminate future shipping costs.

The LTS420 heating element is extremely durable if used carefully. However, the platinum temperature sensor is brittle and can be broken if cleaning is not carefully performed. We recommend a spare heating element to avoid downtime with your stage while element is being repaired.

Part No.	Part Name	Part Description
22222	**LTS Kit**	**Full Replacement Spares Kit**
	WGI	Water/Gas Valve Insert **x2**
	WVC	Water/Gas Valve Connector **x2**
	SSR	Silicon Rings for Lid and Base (Set of 4)
	TUBE	3x6x150mm Clear PVC Tube
	WT	Window Tool (for unlocking lid insert and base locking ring)
	TCH	Tube Clip Holder (for Nitrogen de-fogging stage lid tube)
	ORLTS	Set of O-rings for the Body and Lid
	ACCE	Box of Glass for Windows / Sample: 22x0.17mm (x50); 16x0.17mm (x50); 22x0.3mm (x10)
	LTS/MSC	76x26mm Microscope Slide Carrier
	LTS/MS	Microscope glass slide (76x26x1mm) Box of 100
	COPP	Nickel Plated Heater Shield Cover for LTS350

Part No.	Part Name	Part Description
22222	**LTS Spare Windows Kit**	**Spare windows for Lid, Base and samples**
	SRR	Silicon Rings for Lid and Base (Set of 4)
	ACCE	Box of Glass for Windows / Sample: 22x0.17mm (x50); 16x0.17mm (x50); 22x0.3mm (x10)
	LTS/MS	Standard microscope glass slides (76x26x1mm) Box of 100

Part No.	Part Name	Part Description
22222	**LTSB**	**Spare LTS420 Heating Element with Platinum Temperature Sensor**