QUARTZ GUIDED INFRARED HEATERS

High temperature

High speed

No contact

No outgas

O_2 gas

THERMO RIKO

Thermo Riko's

Quartz guided infrared heaters provide the ideal method for heating your sample in any application that requires clean, high temperature, high speed and heating in gas atmosphere by means of infrared wavelength irradiation. This patented technology was developed 30 years ago and more than 600 unites have been installed in Japan.

High Temperature

There are 3 different power selections for an Infrared lamp, 1kW, 2kW and 3kW. 1kW will be able to heat up a sample typically up to 1,300°C. 2kW will be able to heat a sample up to 1,500°C. Detailed specifications are described in the following pages.

High Speed

Specially designed infrared lamp emits a near Infrared region of wavelengths (mainly 900nm) and the wavelength is focused through the gold coated spheroidal reflector lens. The infrared light is focused on the surface of the upper end of the Quartz rod and then the Quartz rod transmit the wavelength with minimum loss of the total reflection. Thus, very high density infrared radiation will be emitted from the other end of the rod. The maximum heating speed can be 150°C/sec or more depending on the model.

No Contact

Your sample surface will be heated up by Infrared radiation which comes through the Quartz rod without loss of radiation intensity. The sample will be located right at the front of the tip of the Quartz rod and will not require direct contact to the tip of the rod, because the heater won't heat up your sample by means of thermal contact.

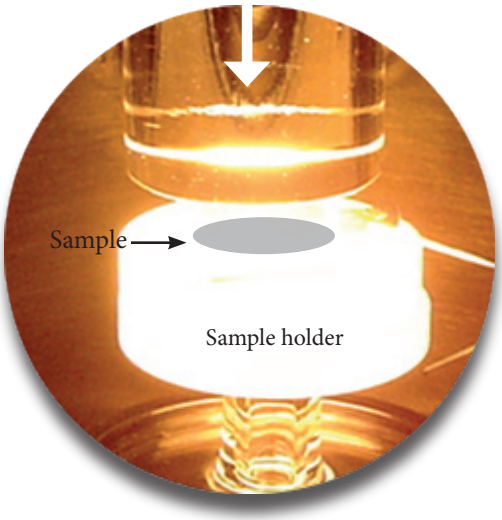
No outgas

From the heat source. The Infrared heater's heat source is a light bulb which is located far from the sample. In the case when your sample is under vacuum pressure, outgassing from the heat source (typically filament or sample holder) contaminates your sample and can cause problems on your analysis. The Infrared heater provides the cleanest method for your sample heating under vacuum environment. Furthermore, as this is non-contact, turning off the lamp will not provide any residual heat around your sample. Thus, the cooling down rate is much faster than other heaters. From the max. temperature to room temperature can be within minutes, not hours.

Oxygen environment

The Quartz and the vacuum seal are the only materials which are exposed to the vacuum. This allows experiments or processes under any gas environments. For example, heat up samples in Oxygen environment is possible.

Quartz Guided Infrared ray



THERMO RIKO CO., LTD.

Quartz Guided Infrared Heater

UHV

GVH

GVL

Quartz Guided Infrared Heater

HV

Model Name	GVH198	GVH298	GV198	GVL298	GVL398
Lamp power	1kW	2kW	1kW	2kW	3kW
Ultimate temperature	1,200˚C	1,400˚C	1,300˚C	1,500˚C	1,600˚C
Max. Heating rate	1 ˚C/sec		100 ~ 150˚C/sec		
Heating size	ø 20 mm (std), (min. ø5. max. ø28mm)				
Vacuum seals	Copper Gasket (viewing port)		Viton O-ring		
Leak rate	1.33 x 10^{-10} Pa•m^3/s or less		1.33 x 10^{-8} Pa•m^3/s or less		
Ultimate pressure	5 x 10^{-11} mbar (5 x 10^{-9} Pa)		5 x 10^{-9} mbar (5 x 10^{-7} Pa)		
Cooling	Air cooling fan(s) and Water cooling				
Water flow rate,	1 l/min	2 l/min	1 l/min	2 l/min	
Mounting flange	CF35 (ø70mm OD) Conflat© flange				

Clean heating in the UHV applications is essential, especially for analytical applications like the XPS (X-ray photoelectron spectrometer). The GVH series uses a Sapphire viewing port on a standard CF35 flange for Ultrahigh Vacuum sealing.

Applications

- Clean heating of a sample in UHV in XPS or SEM.
- Non destructive sample cleaning for surface analysis

UHV · 1400°C · No contact · No outgas

Ultimate temperature : 1,400°C
UHV Compatible
Ultimate pressure: 5 x 10^{-11} mbar

The GVL series provides a high speed heating rate. The maximum temperature can be 1,500°C with the GVL298, 2kW model and 1,500°C, can be achieved within a minute.

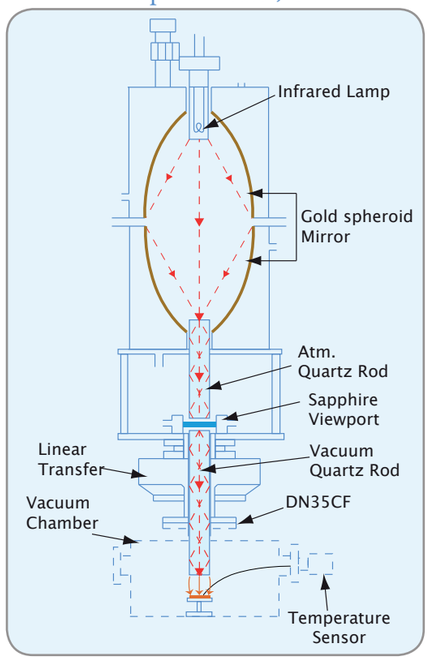
Applications

- Ultra high speed heating of Si, SiC and Graphene
- Formation of films or oxides crystals in oxygen atmosphere
- Laser ablation and temperature desorption spectroscopy, PLD system and rapid annealing system...etc.

High speed · 1500°C · No contact · No outgas

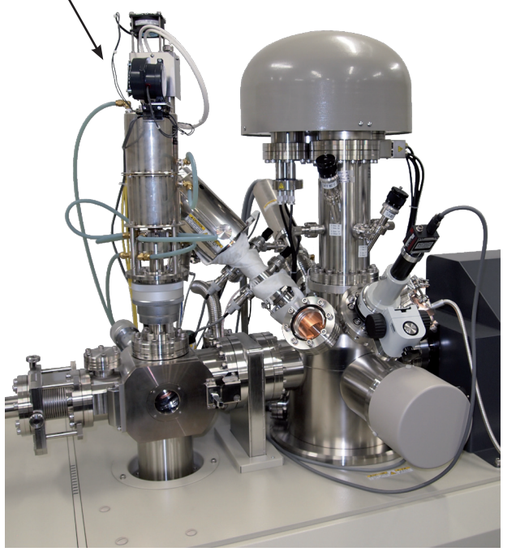
Ultimate temperature : 1,500°C
Heating rate: max. 150°C/sec
Ultimate pressure: 5 x 10^{-9} mbar

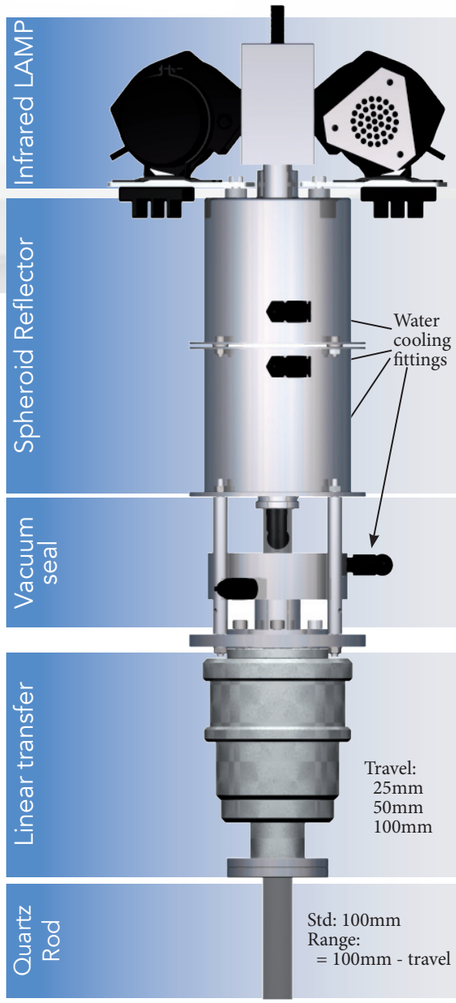
Principle of heater, GVH



GVH298

JEOL XPS system





NIR Lamp, which is specially designed for the NIR wavelength. Air cooling fan(s) is fitted on the side of the lamp holder.

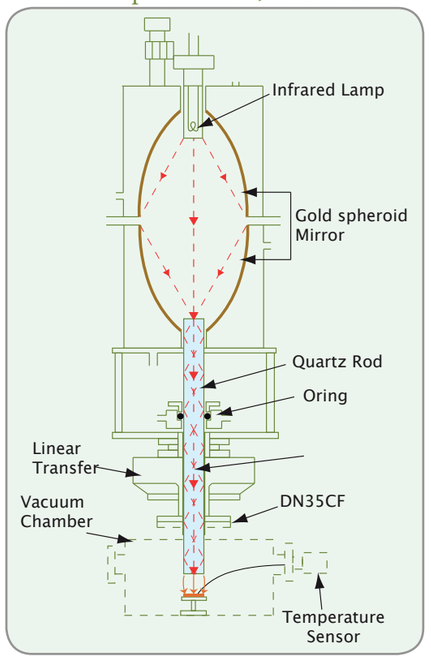
Infrared Reflector 2 reflectors form a spheroidal shape internally. The spheroidal surface is coated with gold which is the best reflection material for NIR wavelength. NIR wavelength is effectively focused at the top of Quartz rod.

Vacuum seal is made in this section. Sapphire viewing port for the GVH and O-rings for the GV/GVL.

Linear motion drive allows positioning of the tip of the Quartz rod close to the sample surface and retracts the rod when unused. The best working distance is 3mm or less.

Quartz rod transfer NIR wavelength by means of total reflection from reflectors to sample surface.

Principle of heater, GV/GVL



Accessories

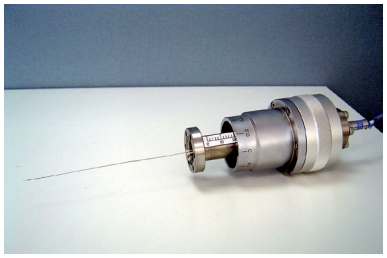
Programmable Temperature Controller (incl. in a standard package)

Features
- AC100V 50/60Hz main
- Program 16 patterns/16 segments
- Max. temperature : 1,700°C
- Sensor: works with R-type T/C
- Analog out: 1 x 0~5V
- Size: 480 x 149 x 320mm

Cooling water flow switch, DFS3R (included in a standard package)

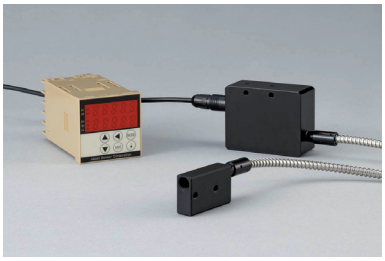
Features
- Monitor cooling water flow
- Interlock signal to controller
- Flow rate: 0.5 ~ 3 L/s adj.

R-Type thermocouple with linear drive, RS250V (optional)



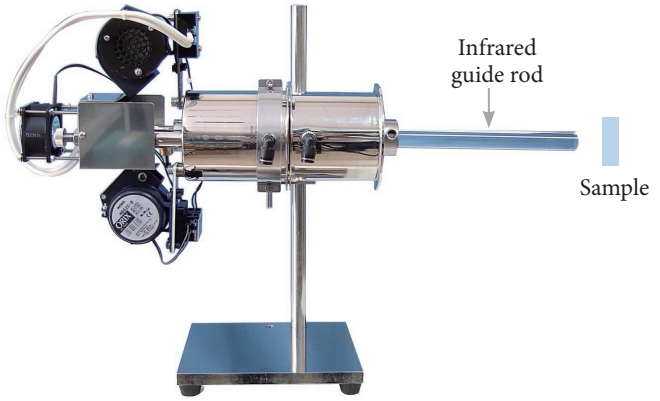
Features
- Extremely thin sheathed: ø0.5
- R type thermocouple (~1,600°C)
- Linear travel: 25mm @0.2 res.
- Mounting flange: CF16
- Leak rate: 1.33 x 10^{-10} Pa•m^3/sec
- K type available (~1,200°C)

Infrared thermal sensor, IR2S (optional)



Features
- No contact monitoring
- Rage: 400 ~ 2,000°C
- Detector: IrGaAs
- Working distance: 200mm (std)

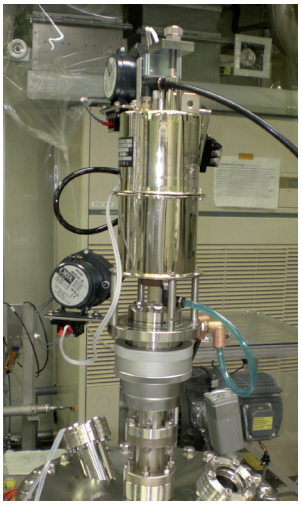
GA Series - Atmospheric applications



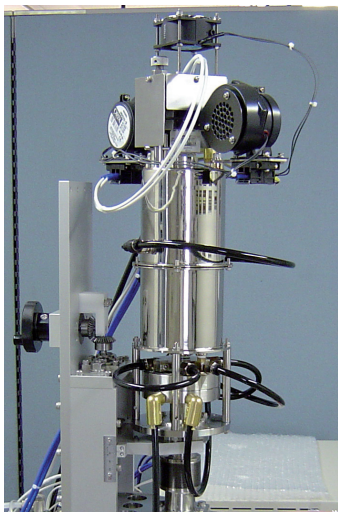
Quartz guided infrared heaters are available for applications under atmospheric pressure - GA Series.

Model name	GA298	GA198
Lamp power	2kW	1kW
Ultimate temp.	1,400°C	1,200°C
Max. heating rate	150°C/sec.	100°C/sec.
Heating Area	20mm dia. max.	
Water flow rate	2 L/s	1 L/s

Examples of installation of the heater



Vertical (or inverted) mount with a standard SD series linear drive



Mount in any position with an optional HD100 linear drive

Contact:

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