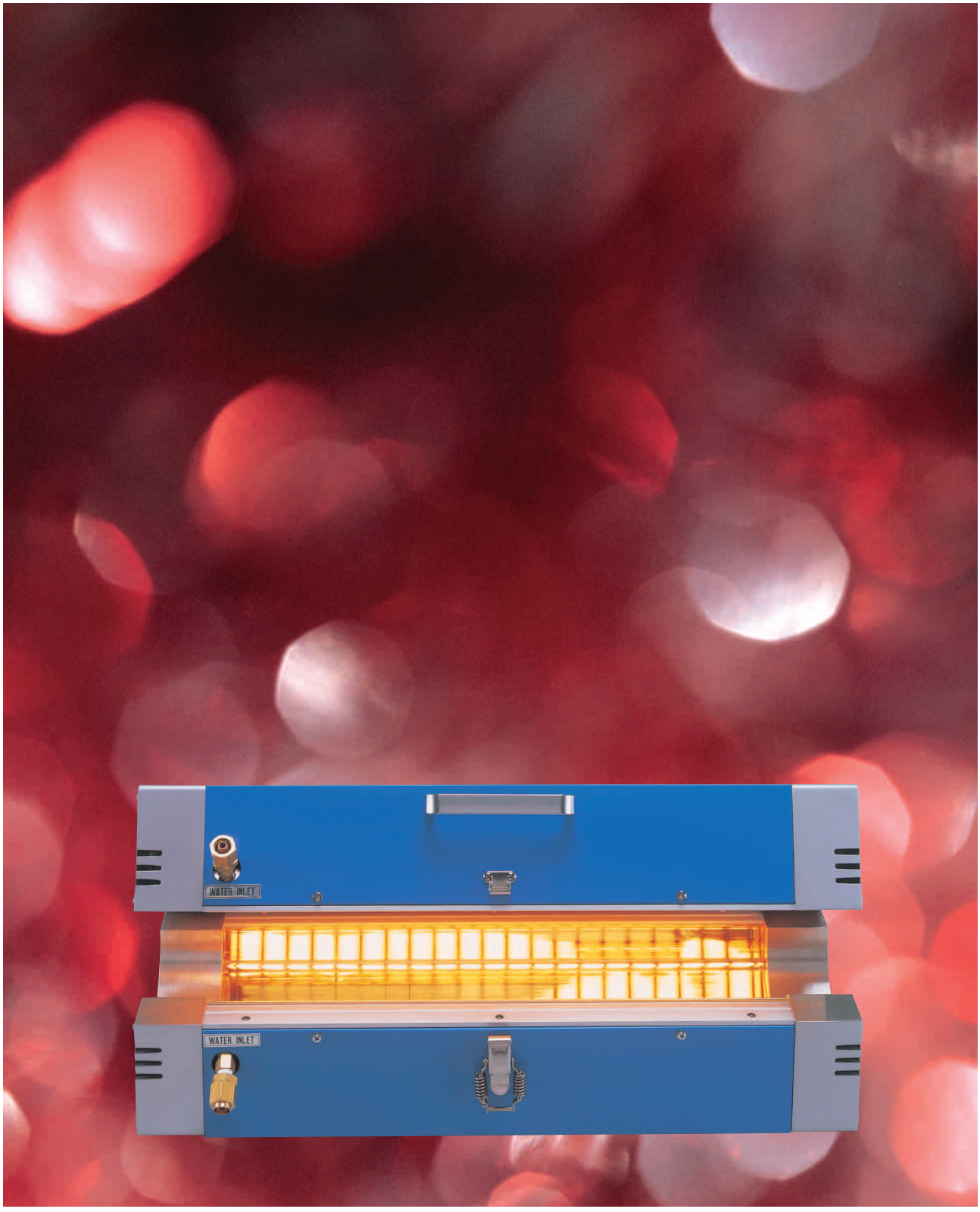
ADVANCE RIKO

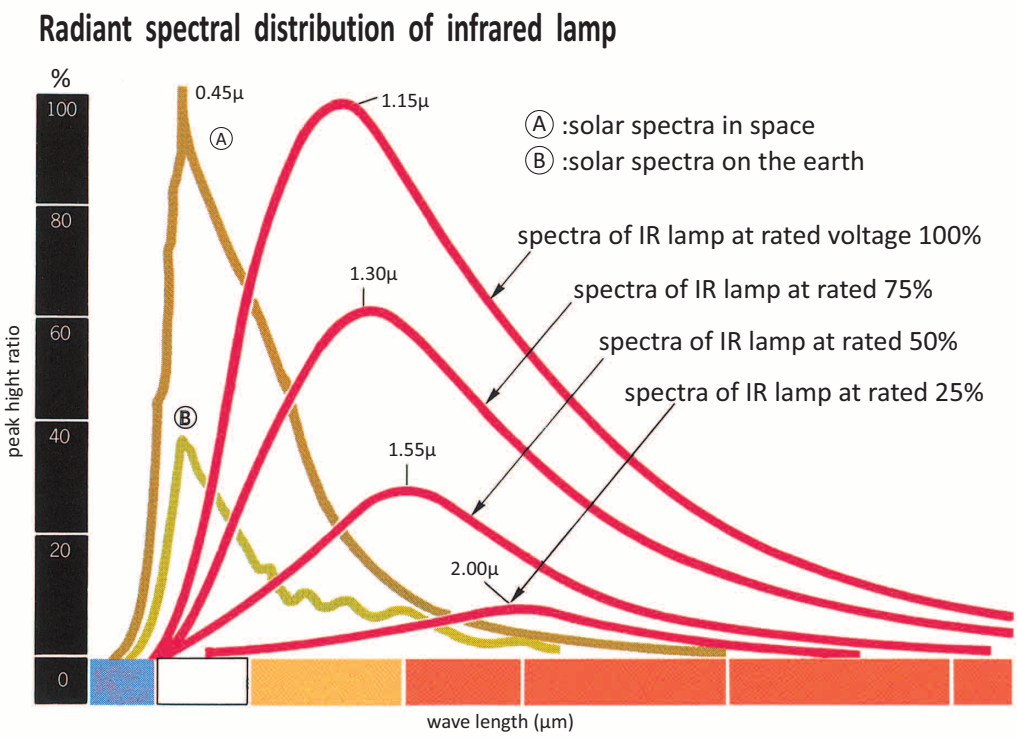
INFRARED GOLD IMAGE FURNACE

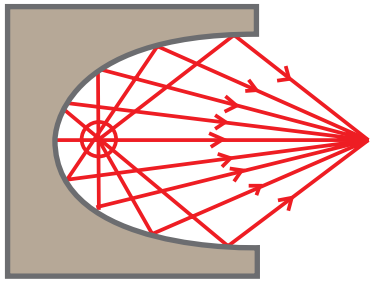
— ENGLISH —



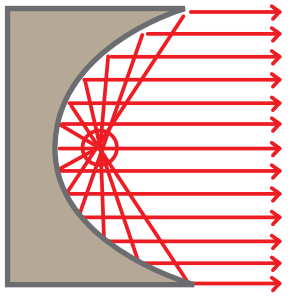
ADVANCE RIKO, Inc.

Infrared gold image furnace for Development





RHL-E & VHT-E series



RHL-P,RHL-Ps & Pss series

Principles

1. Radiation heating

The infrared gold image furnace is a radiation heating furnace that uses an infrared lamp with high energy density as heating source.
The furnace body is made of aluminum alloy with water cooled and the reflection surface of the infrared rays is polished and coated with gold which has a high reflection.

2. Infrared lamp

The tungsten filament is sealed in a quartz glass made tube, which the peak of the spectrum is approximately 1.15μm in the near infrared region. The infrared lamp provide the energy density 10 to 15 times as high as the conventional heating element.

3. Reflector

The reflector is machined with high precision curvature to enhance the reflectance and inhabit the deterioration.
The reflector is available in two types due to its shape, one is elliptical type and the other is parabolic type. The model RHL-E and VHT-E series have a elliptical type reflector and is suitable for the heating of the rod shaped sample, and the other model: RHL-P,RHL-Ps and RHL-Pss series have a parabolic type reflector and is suitable for the sheet shaped sample.

Features

1. High speed heating/cooling up to high temperature

The infrared lamp with high energy density and the gold coated reflector permit high speed heating up to a high temperature. Also, rapid cooling is available with water cooling of the furnace body and additional gas cooling mechanism.

2. High precision temperature control of the sample

The temperature of the sample can be controlled with high accuracy by combing the infrared gold image furnace and the temperature controller for the exclusive use. Also, the control of the cooling speed and the holding at any temperature is available with high accuracy.

3. Clean heating

The heating element of the infrared lamp is sealed in the quartz glass and is free from the gas from the heating element. Also, the insulator is not used in the infrared gold image furnace, and it is free from the dust and gas contamination compared to the electric resistance furnace and is suitable for the use in the clean room.

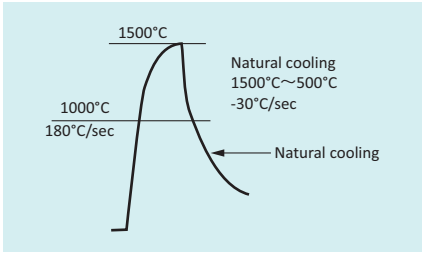
4. Heating/cooling under various atmosphere

The heating/cooling is available in vacuum, high purity inert gas static or flowing with simple operation using a quartz glass made heating/cooling chamber which the infrared ray can be transmitted.

and Evaluation of Materials Technology.

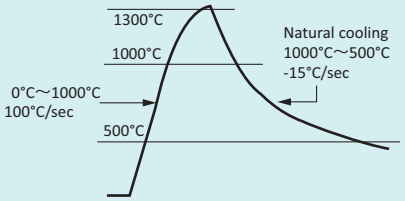
Maximum heat speed test

Furnace: E410P
Sample: W 10 x L 50 x t 1 (mm)
Atmosphere: Air
Material: SUS plate



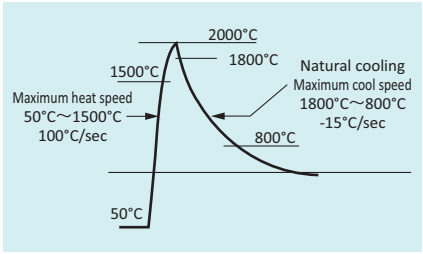
Maximum heat speed test

Furnace: P610P
Sample: W 20 x L 50 x t 0.8 (mm)
Atmosphere: Air
Material: SUS plate



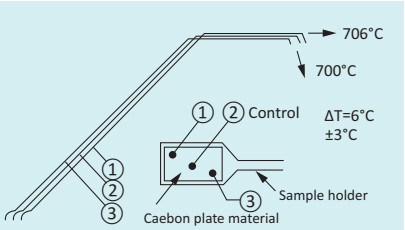
Maximum heat speed test
using a ultra-high temperature furnace

Furnace: VHT-E68
Sample: ϕ12 x L 30 (mm)
Atmosphere: During N_2 flow
Material: Carbon



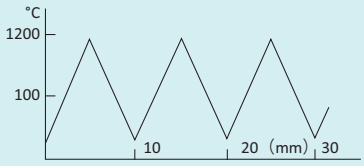
Temperature uniformity test

Furnace: P610CN
Sample: W 50 x L 100 x t 4 (mm)
Atmosphere: During N_2 flow
Material: Carbon plate



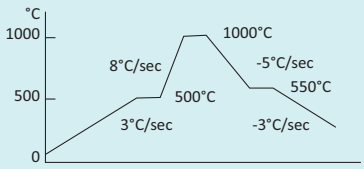
Thermal cycling test

Furnace: E410P
Sample: W 10 x L 50 x t 1 (mm)
Atmosphere: Air
Material : SUS plate



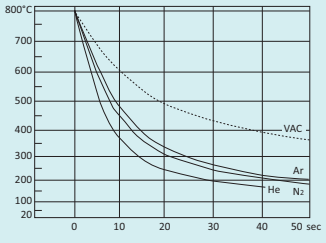
Multi step heat test

Furnace: P610CN
Sample: W 50 x L 80 x t 0.5 (mm)
Atmosphere: During N_2 flow
Material: SUS plate



Cooling speed by gas type

Furnace: P610CP
Sample: W 50 x L 80 x t 0.5 (mm)
Flow rate: 10 L/min
Material: SUS plate



Application

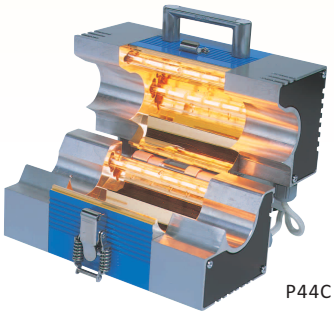
1. Electronic materials
- RTA of Si and Chemical compound semiconductor.
- Heat source for Thin film formation
- Activation after Ion-implantation
- Formation of Silicide

2. Ceramics and Inorganic materials
- Annealing furnace for Laminate on Ceramic substrate.
- Annealing furnace for Glass substrate.
- Annealing furnace for Tensile and Bending test of Ceramic.
- Annealing furnace for superconducting Ceramic
- Annealing furnace for heat impact and cycle test of ceramic

3. Steel and Metal materials
- Furnace for Heating process simulation of thin steel sheet.
- Furnace for Welding simulation
- Furnace for Heat treatment in high vacuum(below 1000°C)
- Furnace for Melting process in atmospheric gas
- Furnace for heat cycle test of Refractory steel and alloy under stress

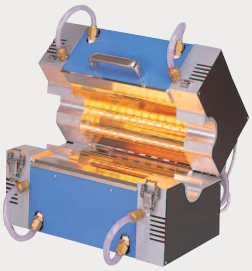
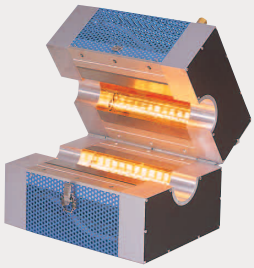
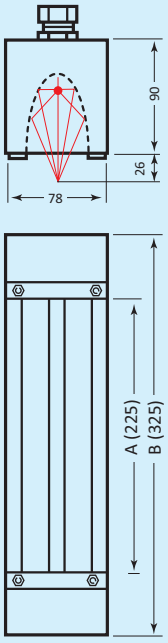
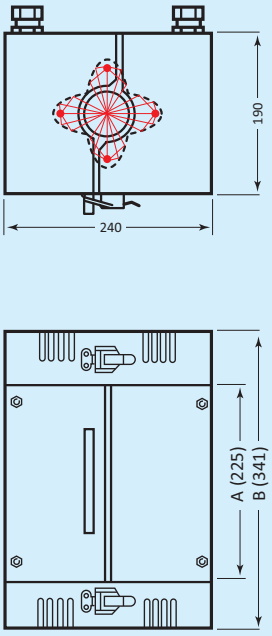
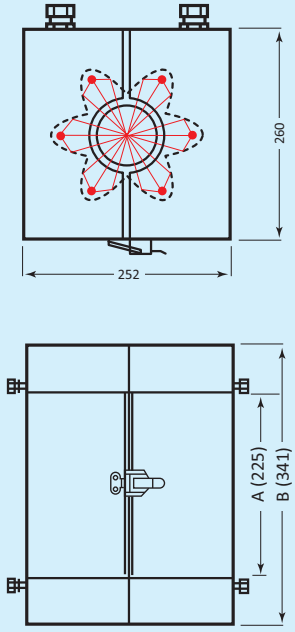
4. Composite materials
- Furnace for heat-resistant evaluation
- Furnace for heat cycle test of Inorganic composite

5. Others
- Furnace for Tensile and compression test at high temperature.
- Sectionalized zone control furnace
- Temperature gradient furnace
- Furnace for evolved Gas analysis



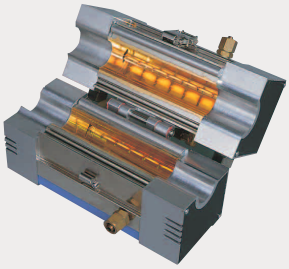
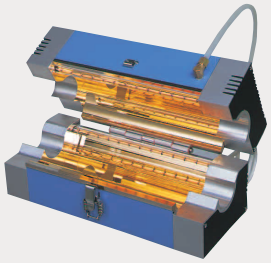
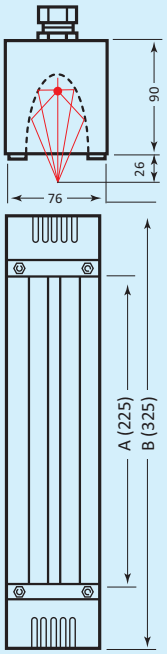
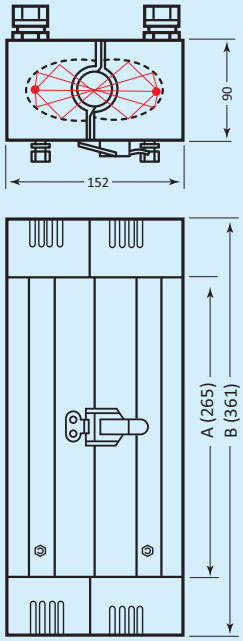
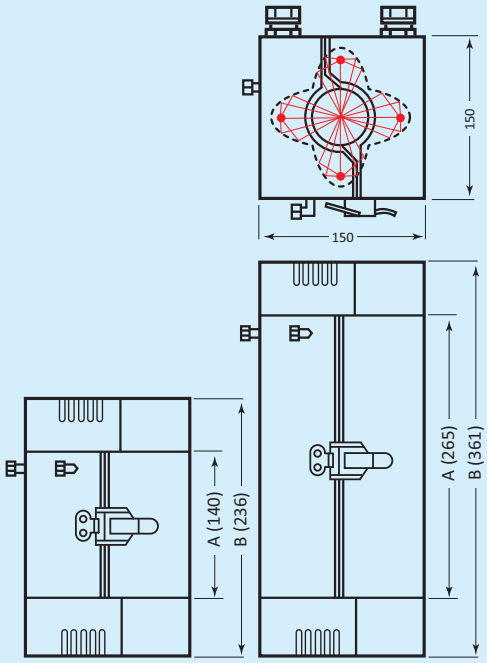
P44C

WIDE VARIATION (Available to customize for different purpose.)

	Elliptical Reflector Furnace (Ultra-high temperature) RHL-E Series					
Focusing method	Line Furnace		Tubular Furnace			
						
Size (mm)						
Model	**VHT-E14L**	**VHT-E18L**	**VHT-E44**	**VHT-E48**	**VHT-E64**	**VHT-E68**
Max. attainable temperature	—	—	1700°C	1800°C	1700°C	1800°C
Max. temperature for normal use	—	—	1500°C	1500°C	1400°C	1500°C
Heating length A	100mm	225mm	100mm	225mm	100mm	225mm
Overall length B	200mm	325mm	216mm	341mm	216mm	341mm
Opening diameter	—	—	ϕ52mm	ϕ52mm	ϕ74mm	ϕ74mm
Focusing diamter (Approx.)	—	—	ϕ10mm	ϕ10mm	ϕ20mm	ϕ20mm
Number of lamp	1	1	4	4	6	6
Type of lamp	2-4-200	6-8-480	2-4-200	6-8-480	2-4-200	6-8-480
Rated voltage	200V	480V	200V	480V	200V	480V
Rating	2.0kW	6.0kW	8.0kW	24.0kW	12.0kW	36.0kW
Cooling water	1.0L/min·0.3Mpa	2.0L/min·0.3Mpa	4.0L/min·0.3Mpa	12.0L/min·0.3Mpa	8.0L/min·0.3Mpa	18.0L/min·0.3Mpa
Cooling gas	—	—	400L/min	600L/min	400L/min	600L/min
Weight (Approx.)	2.5kg	4.0kg	10.0kg	15.0kg	18.0kg	26.0kg

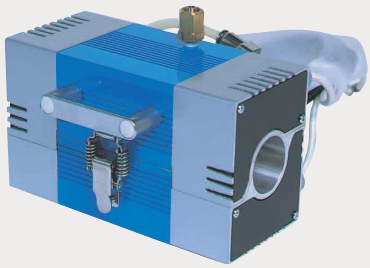
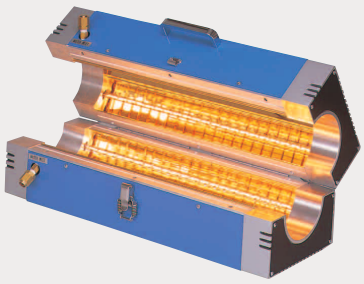
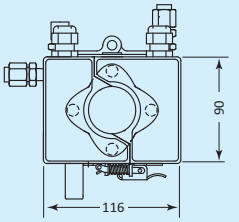
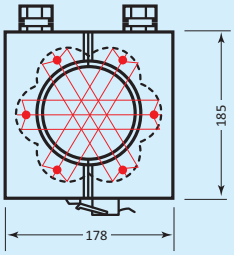
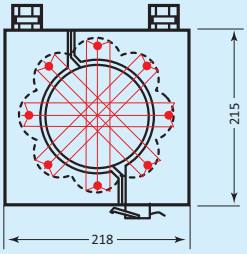
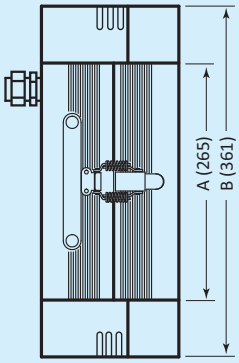
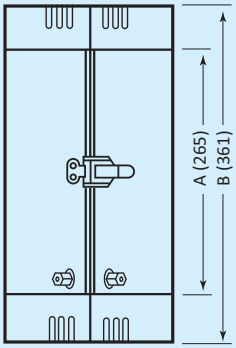
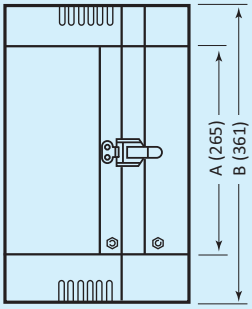
*Maximum attainable temperature and max. temperature for normal use shall be changed depending on the heating material

Elliptical Reflector Furnace RHL-E Series

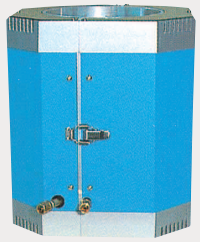
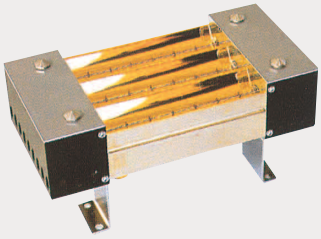
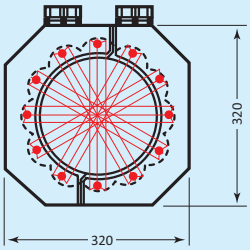
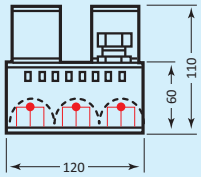
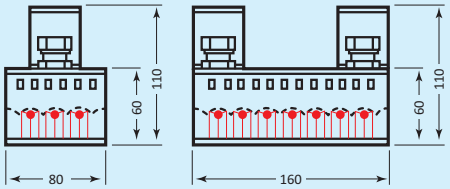
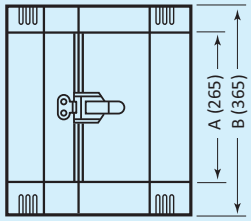
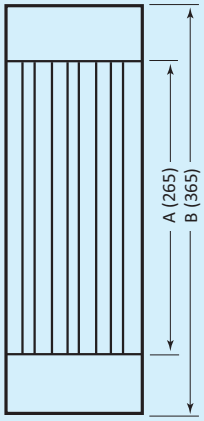
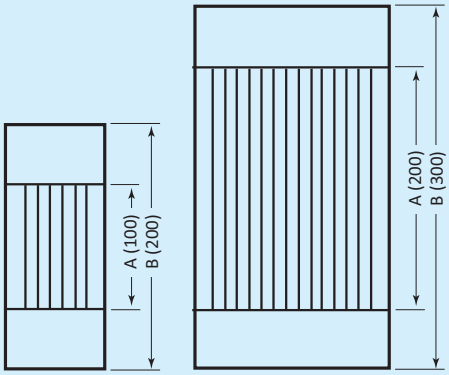
Line Furnace	Tubular Furnace	
		
		

E15L		E110L		E25		E210		E216	E42	E45		E48	E410		E416
N	P	N	P	N	P	N	P	P		N	P		N	P	
—		—		1100°C	1300°C	1100°C	1300°C	1300°C	1100°C	1100°C	1400°C	1400°C	1100°C	1400°C	1400°C
—		—		1000°C	1200°C	1000°C	1200°C	1000°C	1000°C	1000°C	1200°C	1200°C	1000°C	1200°C	1200°C
140mm		265mm		140mm		265mm		420mm	70mm	140mm		200mm	265mm		420mm
236mm		361mm		236mm		361mm		516mm	166mm	236mm		296mm	361mm		516mm
—		—		ϕ32mm		ϕ32mm		ϕ32mm	ϕ52mm	ϕ52mm		ϕ52mm	ϕ52mm		ϕ52mm
—		—		ϕ7mm		ϕ7mm		ϕ7mm	ϕ10mm	ϕ10mm		ϕ10mm	ϕ10mm		ϕ10mm
1		1		2		2		2	4	4		4	4		4
1-5-100	1.2-5-200	1-10-200	2-10-200	1-5-100	1.2-5-200	1-10-200	2-10-200	3-16-300	0.5-2-50	1-5-100	1.2-5-200	1.6-8-200	1-10-200	2-10-200	3-16-300
100V	200V	200V		100V	200V	200V		300V	50V	100V	200V	200V	200V		300V
1.0kW	1.2kW	1.0kW	2.0kW	2.0kW	2.4kW	2.0kW	4.0kW	6.0kW	2.0kW	4.0kW	4.8kW	6.4kW	4.0kW	8.0kW	12kW
1.0L/min·0.3Mpa		1.0L/min·0.3Mpa		1.5L/min·0.3Mpa		2.0L/min·0.3Mpa		3.0L/min·0.3Mpa	1.5L/min·0.3Mpa	2.5L/min·0.3Mpa		3.5L/min·0.3Mpa	4.0L/min·0.3Mpa		5.0L/min·0.3Mpa
—		—		—		—		—	—	—		—	—		—
1.8kg		2.2kg		3.7kg		5.5kg		6.5kg	4.8kg	6.0kg		8.0kg	9.5kg		13.0kg

*Maximum attainable temperature and max. temperature for normal use shall be changed depending on the heating material

	Parabolic Reflector Furnace RHL-P Series									
Focusing method	Tubular Furnace									
										
Size (mm)										
										
Model	P44C	P48C	P410C	P65C		P68C	P610C		P616C	P810C		P816C
				N	P		N	P		N	P	
Max. attainable temperature	1350°C	1350°C	1350°C	900°C	1200°C	1200°C	900°C	1200°C	1200°C	900°C	1100°C	1100°C
Max. temperature for normal use	1200°C	1200°C	1200°C	800°C	1000°C	1000°C	800°C	1000°C	1000°C	800°C	1000°C	1000°C
Heating length A	100mm	200mm	265mm	140mm		200mm	265mm		420mm	265mm		420mm
Overall length B	196mm	296mm	361mm	236mm		296mm	361mm		516mm	361mm		516mm
Opening diameter	ϕ40mm	ϕ40mm	ϕ40mm	ϕ104mm		ϕ104mm	ϕ104mm		ϕ104mm	ϕ124mm		ϕ124mm
Focusing diamter (Approx.)	ϕ20mm	ϕ20mm	ϕ20mm	ϕ40mm		ϕ40mm	ϕ40mm		ϕ40mm	ϕ50mm		ϕ50mm
Number of lamp	4	4	4	6		6	6		6	8		8
Type of lamp	P1-4-100	P1.6-8-200	P2-10-200	1-5-100	1.2-5-200	1.6-8-200	1-10-200	2-10-200	3-16-300	1-10-200	2-10-200	3-16-300
Rated voltage	100V	200V	200V	100V	200V	200V	200V		300V	200V		300V
Rating	4.0kW	6.4kW	8.0kW	6.0kW	7.2kW	9.6kW	6.0kW	12.0kW	18.0kW	16.0kW		24.0kW
Cooling water	2.0L/min·0.3Mpa	4.0L/min·0.3Mpa	5.0L/min·0.3Mpa	4.0L/min·0.3Mpa		5.0L/min·0.3Mpa	6.0L/min·0.3Mpa		8.0L/min·0.3Mpa	7.0L/min·0.3Mpa		8.0L/min·0.3Mpa
Cooling gas	—	—	—	—		—	—		—	—		—
Weight (Approx.)	3kg	5kg	6.0kg	7.2kg		8.5kg	10.5kg		14.5kg	12.7kg		18.2kg

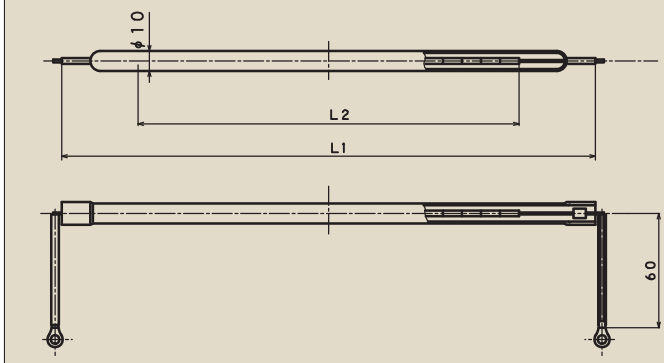
*Maximum attainable temperature and max. temperature for normal use shall be changed depending on the heating material

Parabolic Reflector Furnace RHL-P Series							
Tubular Furnace		Planar Furnace		High-density planar furnace			
							
							
							
P1210C		**P1216C**	**Ps35V**		**Ps310V**		**Pss34V**	**Pss78V**	**Pss1108V**
N	P		N	P	N	P			
900°C	1000°C	1000°C	—		—		—	—	—
700°C	900°C	900°C	—		—		—	—	—
265mm		420mm	140mm		265mm		100mm	200mm	200mm
361mm		516mm	236mm		361mm		200mm	300mm	300mm
ϕ204mm		ϕ204mm	—		—		—	—	—
ϕ80mm		ϕ80mm	140×120mm		265×120mm		100×60mm	200×140mm	200×220mm
12		12	3		3		3	7	11
1-10-200	2-10-200	3-16-300	1-5-100	1.2-5-200	1-10-200	2-10-200	P2-4-200	P1.6-8-200	P1.6-8-200
200V		300V	100V	200V	200V		200V	200V	200V
24.0kW		36.0kW	3.0kW	3.6kW	3.0kW	6.0kW	6.0kW	12.8kW	17.6kW
8.0L/min·0.3Mpa		10.0L/min·0.3Mpa	2.0L/min·0.3Mpa		3.0L/min·0.3Mpa		2.0L/min·0.3Mpa	5.0L/min·0.3Mpa	8.0L/min·0.3Mpa
—		—	—		—		—	—	—
21.0kg		29.0kg	2.5kg		3.0kg		1.7kg	4.0kg	6.0kg

*Maximum attainable temperature and max. temperature for normal use shall be changed depending on the heating material

Heat lamp & related apparatuses

●Lamp model

Shape	Model	Type	Rated Voltage (V)	Maximum Power (W)	Overall length L1 (mm)	Emitting length L2 (mm)
	0.5-2-50	N	50	500	148	65
	1-4-100	P	100	1000	160	100
	1-5-100	N	100	1000	218	155
	1.2-5-100	P	100	1200	218	140
	1.2-5-144	P	144	1200	218	155
	1.2-5-200	P	200	1200	218	140
	1.6-8-200	P	200	1600	280	201
	1-10-200	N	200	1000	344	265
	2-10-200	P	200	2000	344	265
	3-16-300	P	300	3000	490	420
	2-4-200	P	200	2000	167	100
	6-8-480	P	480	6000	300	248

Program Temperature Controller TPC-5000 Series

General Description

●This is a programmable temperature controller which can be used not only for infrared gold image furnace required high speed response when doing rapid heating, but also for low speed heating furnace.
We realized high-functioning, high-performance at the reasonable price.

Feature

●Multi-channel PID as standard function for radiation heating furnace which enables making high speed heating, precise control
●With the built-in programmable software, enables easily inputting temperature program setting and outer signal from a PC. And available to monitor the temperature data during heating on PC.
●Compatible thermocouple JIS K, J, T, E, N, R, S, B and L, U, W, Platinum resistor and also optional voltage input (0～10mV)
●Program configuration 32 programs and 256 steps at the maximum.
●With built-in SCR cirrcuit for 30A,60A,120A, enables covering wider variety of furnace
●Size　W250mm x D380mm x H157mm (Excluding protrusion)

■ TPC-5000-31-1 .....Single phase 100V 30A Output type
■ TPC-5000-32-1 .....Single phase 200V 30A Output type
■ TPC-5000-62-1 .....Single phase 200V 60A Output type
■ TPC-5000-122-1 .....Single phase 200V 120A Output type

※Specification and appearance are subject to change without notice for performance improvement.

Agent

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Cat.No.RHL_E_v2/17.08.1000㊎