



HIGH TEMPERATURE VERTICAL TUBE FURNACE - HTRV

The HTRV high temperature tube furnaces are designed for vertical orientation and operation up to 1800 °C.

The high grade insulation material consisting of fibre plates provides low energy consumption and high heating rates due to its low thermal conductivity. The insulation and the molybdenum disilicide (MoSi₂) heating elements are installed in a rectangular housing. The heating elements hang vertically and can be easily replaced. At higher temperatures and in the presence of oxygen, MoSi₂ develops an oxide layer which protects the heating elements against further thermal or chemical corrosion.

With its wide range of accessories, the comprehensive HTRV tube furnace range provides complete system solutions for ambitious thermal treatment at high temperatures.

Furnaces are supplied without a stand, allowing customers to build them into their own equipment. Optional 'L' stands are available allowing the furnaces to be self supporting.

APPLICATION EXAMPLES

annealing, carbonisation, crystal growth, debinding, degassing, drying, hardening, metal injection moulding (MIM), pyrolyses, rapid prototyping, sintering, sublimation, synthesis, tempering

STANDARD FEATURES

- | 1800 °C maximum operating temperature
- | Programmable EPC3016P1 controller
- | Over-temperature protection
- | Optimised for vertical usage
- | Accepts work tubes with outer diameters up to 100 mm for use with modified atmosphere
- | Accepts work tubes with outer diameters up to 200 mm for use in air
- | Heated lengths of 100, 250 or 500 mm
- | High grade type B thermocouple
- | Low thermal mass ceramic fibre insulation
- | Vertically hanging, high quality MoSi₂ heating elements
- | Rectangular housing with holes for convection cooling
- | Furnace comes with separate control box with 3 m cable, plug and socket
- | Ethernet communications

OPTIONS (*SPECIFY THESE AT TIME OF ORDER*)

- | A range of sophisticated digital controllers, multisegment programmers and data loggers with digital communication options is available - more information about controllers

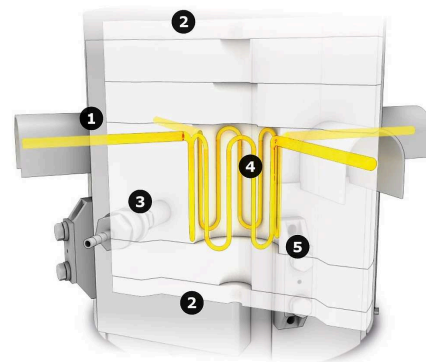
- | A range of additional work tubes is available in a variety of materials
- | Insulation plugs & radiation shields are strongly recommended for high temperature vertical tube furnaces to prevent heat loss & improve uniformity
- | Modified atmosphere and vacuum assemblies are available - more information
- | Vacuum packages with a choice of rotary vane pump or turbomolecular pump are available for furnaces with tube inner diameters of 60 mm and above
- | 'L' stand for convenient usage
- | Oxygen sensor for inert gas packages
- | Gas packages with manual or automatic valve for up to 3 gases
- | 6 m long cable between furnace body and control box with plug and socket
- | Laboratory Gas Safety System for safe use with hydrogen above 750 °C

HIGH TEMPERATURE VERTICAL TUBE FURNACE - HTRV

TECHNICAL DETAILS

View inside the HTRV high temperature tube furnace

1. outer case
2. ceramic fibre end insulation
3. ceramic fibre case insulation
4. heating elements
5. ceramic fibre inner insulation



View inside

HIGH TEMPERATURE VERTICAL TUBE FURNACE - HTRV

EXAMPLES



HTRV 17/150/250 with optional L-stand



HTRV 18/100/500 with optional inert gas package and ceramic tube closed on one side



HTRV 18/70/250 with optional inert gas package, high vacuum flanges, E3508P10 programmer and current/voltage display

Content may be subject to modifications or corrections

TECHNICAL DETAILS (MODELS)

	HTRV __/40/100	HTRV __/40/250	HTRV __/40/500
Max temp (°C)	1600, 1700, 1800	1600, 1700, 1800	1600, 1700, 1800
Max outer diameter accessory tube (mm)	40	40	40
Heated length (mm)	100	250	500
Dimensions:			
External H x W x D (mm)	365 x 455 x 455	515 x 455 x 455	765 x 455 x 455
Furnace weight (kg)	30	40	65
Tube length for use in air (mm)	355	505	755
Tube length for use with modified atmosphere (mm)	890	1040	1290
Control module dimensions H x W x D (mm)	500 x 550 x 700	500 x 550 x 700	850 x 550 x 700
Control module weight (kg)	50	50	60
Uniform length ±5°C (mm)	50	125	250
Max power (W)	2000	3000	6000

	HTRV __/70/100	HTRV __/70/250	HTRV __/70/500
Max temp (°C)	1600, 1700, 1800	1600, 1700, 1800	1600, 1700, 1800
Max outer diameter accessory tube (mm)	70	70	70
Heated length (mm)	100	250	500
Dimensions:			
External H x W x D (mm)	365 x 455 x 455	515 x 455 x 455	765 x 455 x 455
Furnace weight (kg)	30	40	65
Tube length for use in air (mm)	355	505	755
Tube length for use with modified atmosphere (mm)	890	1040	1290
Control module dimensions H x W x D (mm)	500 x 550 x 700	850 x 550 x 700	850 x 550 x 700
Control module weight (kg)	50	60	90
Uniform length ±5°C (mm)	50	125	250
Max power (W)	3000	4800	8000

	HTRV __/100/250	HTRV __/100/500	HTRV __/150/250
Max temp (°C)	1600, 1700, 1800	1600, 1700, 1800	1600, 1700, 1800
Max outer diameter accessory tube (mm)	100	100	150
Heated length (mm)	250	500	250
Dimensions:			
External H x W x D (mm)	515 x 455 x 455	765 x 455 x 455	515 x 580 x 580
Furnace weight (kg)	45	70	55
Tube length for use in air (mm)	505	755	505
Tube length for use with modified atmosphere (mm)	1040	1290	1040
Control module dimensions H x W x D (mm)	850 x 550 x 700	850 x 550 x 700	850 x 550 x 700
Control module weight (kg)	60	90	90
Uniform length ±5°C (mm)	125	250	-
Max power (W)	6400	10400	8000

	HTRV __/150/500	HTRV __/200/250	HTRV __/200/500
Max temp (°C)	1600, 1700, 1800	1600, 1700, 1800	1600, 1700, 1800
Max outer diameter accessory tube (mm)	150	200	200
Heated length (mm)	500	250	500
Dimensions:			
External H x W x D (mm)	765 x 580 x 580	515 x 580 x 580	765 x 580 x 580
Furnace weight (kg)	80	70	95
Tube length for use in air (mm)	755	505	355
Tube length for use with modified atmosphere (mm)	1290	1040	890
Control module dimensions H x W x D (mm)	850 x 550 x 700	850 x 550 x 700	850 x 550 x 700
Control module weight (kg)	90	90	90
Uniform length ±5°C (mm)	-	-	-
Max power (W)	12000	10000	18500

Please note

- Heat up rate when using a ceramic work tube must be limited to 5 °C/min
- Further to the depth of the control module 150 mm for the power plugs and other plugs needs to be added
- The power supply is based on 200 – 240 V for 1 phase and 380 – 415 V for 3 phase power
- Minimum uniform length in horizontal furnace with insulation plugs fitted at 100 °C below max. temperature
- Maximum continuous operating temperature is 100°C below maximum temperature
- Power supply: a = 1 phase (16A)+N / b = 3 phase (16A)+N / c = 3 phase (32A)+N / d = 3 phase (63A)+N

www.carbolite.com/htrv