

## Bottom loading furnace, graphite insulation - HTBL GR

### General Information

HTBL bottom loading graphite furnaces offer temperatures of 2200 °C or 3000 °C upon request. Graphite models of the HTBL are offered in volumes of 50, 80 and 200 litres.

One clear advantage is the easy loading and unloading of the HTBL type furnaces. Once the hearth has been lowered, the sample is accessible from all sides without limitations. Sample loading is extremely easy and user-friendly, especially with delicate samples. Additionally, sample thermocouples can be placed at specified locations within the chamber. A retort may also be used with the HTBL. The movement of the loading area is fully automated and driven by a hydraulic arm. Once the loading area has reached the lowest position, the user can manually rotate the loading platform outward by 90 °.

Nitrogen, Argon, and Hydrogen gases are available for use as either pure or mixed gas. Other gases may be installed upon request. A slight overpressure or controlled partial pressure, to establish a defined gas flow, can be used in the furnace. Operation with air is not possible.

Various dosing and controlling devices control all gases. Depending on the vacuum requirements, vacuum pumps are configured specifically for the application or as requested. The temperature is independently controlled to achieve the best uniformity.



### Standard features

- Graphite furnaces offer the highest possible temperatures
- Hydrogen partial pressure operation upon request
- Precisely controlled vacuum pumping speeds appropriate for use with powders
- Fully automatic operation
- Data recording for quality management

### Technical Specifications

#### HTBL-H 50 GR/22-1G

Insulation material	Graphite
Volume (l)	50
Tmax vacuum (°C)	2200
Dimensions: External H x W x D (mm)	4300 x 2400 x 2200
Transport weight (kg)	3200
Usable space	
Ø x H, usable space without retort (mm)	300 x 700
Ø x H, usable space with retort (mm)	280 x 680

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### Thermal values

Tmax atmospheric pressure (°C)	2200
-Delta-T, between 500°C and 2200°C (K) according to DIN 17052	± 10
Max. heat-up rate (K/min)	10
Cooling time (h)	8
Connecting values	
Power (kW)	120
Voltage (V)	400 (3P)
Current (A)	3 x 175
Series fuse (A)	3 x 250
Vacuum (option)	
Leakage rate - clean, cold and empty (mbar l/s)	< 5x10 <sup>-3</sup>
Vacuum range depending on the pumping unit	rough or fine vacuum
Cooling water required	
Flow (l/min)	100
Gas supply	
Nitrogen or Argon flow, others on request (l/h)	500-2000
Controller	Siemens WinCC flex

### HTBL 50 GR/22-1G

Insulation material	Graphite
Volume (l)	50
Tmax vacuum (°C)	2200
Dimensions: External H x W x D (mm)	3500 x 2400 x 2200
Transport weight (kg)	3200
Usable space	
Ø x H, usable space without retort (mm)	400 x 400
Ø x H, usable space with retort (mm)	380 x 380
Thermal values	
Tmax atmospheric pressure (°C)	2200
-Delta-T, between 500°C and 2200°C (K) according to DIN 17052	± 10
Max. heat-up rate (K/min)	10
Cooling time (h)	8
Connecting values	
Power (kW)	120
Voltage (V)	400 (3P)

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Current (A)	3 x 175
Series fuse (A)	3 x 250
Vacuum (option)	
Leakage rate - clean, cold and empty (mbar l/s)	< 5x10 <sup>-3</sup>
Vacuum range depending on the pumping unit	rough or fine vacuum
Cooling water required	
Flow (l/min)	100
Gas supply	
Nitrogen or Argon flow, others on request (l/h)	500-2000
Controller	Siemens

### HTBL 80 GR/22-1G

Insulation material	Graphite
Volume (l)	80
Tmax vacuum (°C)	2200
Dimensions: External H x W x D (mm)	4300 x 2400 x 2200
Transport weight (kg)	3500
Usable space	
Ø x H, usable space without retort (mm)	400 x 700
Ø x H, usable space with retort (mm)	380 x 680
Thermal values	
Tmax atmospheric pressure (°C)	2200
-Delta-T, between 500°C and 2200°C (K) according to DIN 17052	± 10
Max. heat-up rate (K/min)	10
Cooling time (h)	12
Connecting values	
Power (kW)	200
Voltage (V)	400 (3P)
Current (A)	3 x 290
Series fuse (A)	3 x 400
Vacuum (option)	
Leakage rate - clean, cold and empty (mbar l/s)	< 5x10 <sup>-3</sup>
Vacuum range depending on the pumping unit	rough or fine vacuum
Cooling water required	
Flow (l/min)	150

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### Gas supply

Nitrogen or Argon flow, others on request (l/h)	500-2000
Controller	Siemens

### HTBL 200 GR/22-1G

Insulation material	Graphite
Volume (l)	200
Tmax vacuum (°C)	2200
Dimensions: External H x W x D (mm)	4800 x 2400 x 2600
Transport weight (kg)	4200
Usable space	
Ø x H, usable space without retort (mm)	500 x 900
Ø x H, usable space with retort (mm)	480 x 880
Thermal values	
Tmax atmospheric pressure (°C)	2200
-Delta-T, between 500°C and 2200°C (K) according to DIN 17052	± 10
Max. heat-up rate (K/min)	10
Cooling time (h)	16
Connecting values	
Power (kW)	300
Voltage (V)	400 (3P)
Current (A)	3 x 430
Series fuse (A)	3 x 630
Vacuum (option)	
Leakage rate - clean, cold and empty (mbar l/s)	< 5x10 <sup>-3</sup>
Vacuum range depending on the pumping unit	rough or fine vacuum
Cooling water required	
Flow (l/min)	220
Gas supply	
Nitrogen or Argon flow, others on request (l/h)	500-2000
Controller	Siemens