HTK GR - CUPTOR CU CAMERĂ, IZOLAȚIE DIN GRAFIT

The Graphite Furnace HTK GR operates with rough/fine vacuum, protective gases such as Nitrogen/Argon, and reactive gases like Hydrogen and Carbon Monoxide. The Graphite Furnace HTK GR cannot operate in an Oxygen atmosphere due to the Graphite insulation.

The rectangular design with a front door allows for easy loading and unloading. The HTK GR range is available in up to six different sizes. The smallest designs with a capacity of 8 litres and 25 litres are typically employed by laboratories for research and development. The 80 litre, 220 litre, 400 litre or 600 litre furnaces are predominantly used as pilot manufacturing systems or large scale production.

The HTK GR is based on Graphite insulation material, as well as graphite heating elements. With maximum temperatures up to 2200 °C, the HTK GR is suited for extreme heat treatment needs. Upon request, the system can be equipped with a Graphite retort that is capable of a defined gas guiding flow within the unit and improves temperature uniformity to < ± 10 °C. For processes with strong outgassing, the retort protects the heating elements and increases the lifetime of the furnace.

EXEMPLE DE APLICAȚII

Ceramică Tehnică, graphiting, pyrolysis, siliconization, sintering

Click pentru video

Video Produs: HTK GR - Cuptor cu cameră, izolație din grafit

CARACTERISTICI STANDARD

Graphite furnace, offering the highest possible temperatures

Hydrogen partial pressure operation if requested

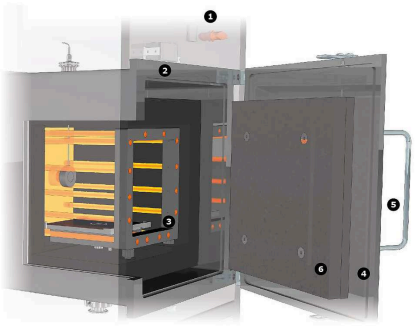
Precisely controlled vacuum pumping speeds appropriate for powders

Data recording for quality management

DETALII TEHNICE

View inside of the HTK Graphite Furnace

1. frame
2. water cooled vessel
3. heating cassette
4. groove for the sealing
5. front door
6. graphite insulation



View inside of the HTK GR

Inside the chamber, heating elements are positioned at the bottom, left, right, and top sides of the furnace chamber allowing for improved temperature uniformity. For larger volumes, the back wall and front are equipped with heating elements to maintain excellent temperature uniformity. The HTK W, HTK MO, HTK GR and HTK KE furnaces are surrounded by a water cooled vessel; thus classifying, the HTK systems as a cold wall furnace. The cooling water is guided through the double walled vessel.

Upon request, the HTK GR can be operated up to 3000 °C. For operation at 3000 °C, the furnace is specially designed with a specific isolation thickness, optimal positioning of the heating elements, and a pyrometer for temperature measurement and control. The pyrometer directly measures the heat radiation by optical methods via a window inside the furnace and is not directly inserted into the furnace.

This measurement principle only works if a sufficient amount of radiation is emitted. The needed radiation is only generated at temperatures exceeding 400 °C. For lower temperatures, a sliding thermocouple is used to control the lower temperatures.

Because of the increasing vapor pressure of graphite, 3000 °C operation is only possible under inert gas atmosphere. Additionally, the high vapor pressure also results in carbon being released to the atmosphere. For carbon sensitive samples, a metallic high temperature furnace must be used.

EXEMPLE

HTK 8 GR/22-1G smart up to 2200°C

HTK 25 GR/22-1G automat până la 2200°C cu sistem opțional de piroliză

HTK 400 GR/22-1G automatic up to 2200°C

DETALII TEHNICE (MODELE)

	HTK 8 GR/22-1G	HTK 25 GR/22-1	HTK 80 GR/22-1G
Insulation material	Graphite	Graphite	Graphite
Dimensiuni: Externe H x W x D (mm)	2100 x 1300 x 1100	2200 x 1900 x 1800	2300 x 2100 x 2200
Transport weight (kg)	1200	1700	2000
Usable space			
Volum (l)	8	25	80
H x W x D, usable space without retort (mm)	200 x 200 x 200	250 x 250 x 400	400 x 400 x 500
H x W x D, usable space with retort (mm)	180 x 180 x 200	230 x 230 x 400	380 x 380 x 400
Thermal values			
Tmax vacuum (°C)	2200	2200	2200
Tmax atmospheric pressure (°C)	2200	2200	2200
-Delta-T, between 500 and 1500°C (K) according to DIN 17052	± 10	± 10	± 10
Max. heat-up rate (K/min)	10	10	10
Cooling time (h)	6	6	8
Connecting values			
Putere (kW)	26.5	60	100
Voltage (V)	400 (3P)	400 (3P)	400 (3P)
Current (A)	3 x 66	3 x 90	3 x 150
Series fuse (A)	3 x 80	3 x 125	3 x 200
Vacuum (option)			
Leakage rate - clean, cold and empty (mbar l/s)	5x10-3	5x10-3	5x10-3
Vacuum range depending on the pumping unit	rough or fine vacuum	rough or fine vacuum	rough or fine vacuum
Cooling water required			

	HTK 8 GR/22-1G	HTK 25 GR/22-1	HTK 80 GR/22-1G
Flow (l/min)	40	70	100
Max. inlet temperature (°C)	23	23	23
Gas supply			
Nitrogen or Argon flow, others on request (l/h)	200-2000	200-2000	200-2000
Controller	on request	on request	on request

	HTK 220 GR/22-1G	HTK 400 GR/22-1G	HTK 600 GR/22-1G
Insulation material	Graphite	Graphite	Graphite
Dimensiuni: Externe H x W x D (mm)	2500 x 2300 x 2600	2500 x 2300 x 2600	2500 x 2500 x 2900
Transport weight (kg)	3000	3800	4500
Usable space			
Volum (l)	220	400	600
H x W x D, usable space without retort (mm)	600 x 600 x 600	650 x 700 x 900	650 x 750 x 1200
H x W x D, usable space with retort (mm)	560 x 560 x 560	630 x 680 x 900	630 x 730 x 1200
Thermal values			
Tmax vacuum (°C)	2200	2200	2200
Tmax atmospheric pressure (°C)	2200	2200	2200
-Delta-T, between 500 and 1500°C (K) according to DIN 17052	± 10	± 10	± 10
Max. heat-up rate (K/min)	10	10	10
Cooling time (h)	8	12	12-16
Connecting values			
Putere (kW)	160	250	300
Voltage (V)	400 (3P)	400 (3P)	400 (3P)
Current (A)	3 x 240	3 x 370	3 x 450
Series fuse (A)	3 x 315	3 x 500	3 x 500
Vacuum (option)			
Leakage rate - clean, cold and empty (mbar l/s)	5x10-3	5x10-3	5x10-3
Vacuum range depending on the pumping unit	rough or fine vacuum	rough or fine vacuum	rough or fine vacuum
Cooling water required			
Flow (l/min)	150	200	2200

	HTK 220 GR/22-1G	HTK 400 GR/22-1G	HTK 600 GR/22-1G
Max. inlet temperature (°C)	23	23	23
Gas supply			
Nitrogen or Argon flow, others on request (l/h)	1000-10000	1000-10000	1000-10000
Controller	on request	on request	on request

www.carbolite.com/htkgr