

High Temperature 3 Zone Horizontal Tube Furnace



Make: Nano Tec,

Model. No: NT/HTF (1800°C)-2022

Model. No : NT/CVD_3 (1200 °C)-2022



Technical Specifications

I. Annealing process using 1800 °C single zone horizontal tube furnace

Make: Nano Tec

Model. No: NT/HTF (1800 °C)-2022

1.	Temperature	Maximum continuous operation temperature: 1700 °C and Maximum operating temperature: 1800 °C.
2.	Furnace construction /design	High temperature tube furnace designed for horizontal mode operation. Rectangular housing with holes for convection cooling Furnace with separate control box with 3 m cable, plug and socket
3.	Heating elements	MoSi2 heating elements installed in rectangular housing and hanging vertically that can be easily replaced.
4.	Heating zones	Single Zone
5.	Heating and Colling rates	Heating: Minimum 0.5 °C and Maximum 5 °C Cooling: Gradual cooling down
6.	Insulation	Low thermal mass ceramic fibre insulation High grade insulation material with low thermal conductivity consisting of ceramic fibre inner insulation, ceramic fibre case insulation and ceramic fibre end insulation Installed in a rectangular housing to provide low energy consumption and high heating rates.
7.	Configuration	Horizontal mode
8.	Thermocouple	High grade type B thermocouple
9.	Over Temperature Protection Control	Over Temperature Protection Control to protect load or furnace during unattended operation
10.	Programmable temperature controller	Colour Touch screen controller offering Set point control, Program profile control, 10 unique program profiles saved in memory, 24 segments per unique program, ether net communication, Panel mounted USB socket, Data logging to a USB memory stick in a .csv file format, Real time clock, Program schedule start, Program status indication with estimate end time & date, 2 Events indication, Control power indication, User level security, Single point temperature calibration that can be set as ramp, step or dwell and can be configured to control relays.
11.	Heated length	Heated tube maximum length upto (mm): 300. Uniform length $\pm 5^{\circ}\text{C}$ (mm): 150.
12.	Dimensions	Furnace external dimensions: H x W x D (mm): $600 \pm 20 \times 600 \pm 20 \times 500 \pm 20$ and weight ≤ 65 kg • Control module dimensions H x W x D in mm: $850 \pm 10 \times 550 \pm 10 \times 500 \pm 10$ and weight ≤ 150 kg.

13.	Work tube package for operation of the furnace in inert atmosphere	Recrystallized Alumina (C799) material work tube with 70 mm outer diameter, 60 mm inner diameter & 1115 mm length. Radiation shields – 2 Nos. A set of two insulation plugs. Insulation sleeves – 2 Nos. Water cooled high vacuum flanges Furnace mounted flange holders Inert gas inlet valve Flowmeter (argon 2 -20 litres per hour) – 1 No. Over pressure valve. Insulation plugs – 2 Nos.
14.	Power supply and maximum power (W)	Three phase, 6400 W
15.	Warranty	24 months from the date of commissioning and acceptance of equipment
I. Chemical Vapour Transport (CVT) process using 1200 Degrees C, Three zone Gradient horizontal split tube furnace Make: Nano Tec Model. No: NT/CVD_3 (1200°C)-2022		
16.	Temperature	Maximum Temperature: 1200°C. Maximum continuous operating temperature: 1100 °C.
17.	Heating elements	High quality heating elements with excellent and unsurpassed temperature uniformity along the entire heated length. Fast heat-up and cool-down rates.
18.	Insulation	High quality thermal insulation
19.	Heating zones	Three independently handling Zone
20.	Heated zones and unheated zones	Three 150 mm long heated zones and two 75 mm long unheated zone barriers
21.	Heating and Colling rates	Heating: Minimum 0.5 °C and Maximum 5 °C Cooling: Gradual cooling down
22.	Furnace type and dimensions	Compact, horizontal and split type. Furnace body is split into two halves and hinged at the rear; pneumatic dampening struts at either end provide a smooth opening action. Furnace body dimensions: H x W x D in mm 575 ± 20 x 800 ± 20 x 500 ± 20. Control module dimensions: 225 ± 20 x 800 ± 20 x 500 ±20. Weight of the furnace: Approximately 55 kg

23.	Furnace design and configuration	Flexible design to use a variety of tube diameters with the use of adapters. Specifically designed to provide a temperature gradient along the length of the three heated zones. Tube furnace mounted on top of the control box. The furnace body to be easily detached and separated for remote operation. Configuration to include a 2metre cable (including plug and socket) between the furnace body and control box
24.	Temperature controllers and thermocouples.	<p>Programmable temperature controllers to be fitted in three heated zones – 3 Nos. One programmable temperature controller and one thermocouple to be fitted in each heated zone.</p> <p>Programmable temperature controller with 1 program and 24 segments. Each segment can be set as ramp, step or dwell and can be configured to control two relays.</p> <p>Ethernet communication is fitted as standard and certified for cybersecurity communications robustness.</p>
25.	Temperature Gradients	<p>Zone 1: 1100 °C, Zone 2: 950 °C, Zone 3: 800 °C.</p> <p>Zone 1: 1100 °C, Zone 2: OFF, Zone 3: 400 °C.</p> <p>Above temperature, gradients are to be achieved in 3 zone gradient tube furnace and graphical documentation confirming above data to be produced along with technical literature.</p>
26.	Heating elements	Wire elements in high-quality vacuum-formed insulation ensure fast heat up, excellent temperature control and short cool down times
27.	Over Temperature Protection Controller	Digital over-temperature protection controllers fitted in all three zones of the furnace. Includes three independent thermocouples fitted in all the three zones.
28.	Work tube package for operation in inert atmosphere	<p>Work tube package for the operation of the furnace in an inert atmosphere consisting of the following items to be included in the furnace.</p> <p>Quartz work tube with 60 mm outer diameter, 55 mm inner diameter & 1050 mm length.</p> <p>Insulation plugs – 2 Nos.</p> <p>Work tube end seals:</p> <p>Gas inlet/outlet pipe – 1 No.</p> <p>Gas inlet/outlet pipe + thermocouple gland – 1 No.</p> <p>Probe thermocouple access up to 1200°C: Probe thermocouple gland complete with type N thermocouple.</p>



29.	Standard inert gas package for operation in inert atmosphere	Gas inlet = 6 mm outside diameter push-in fitting Manual on/off ball valve Pressure relief valve Pressure gauge Flow meter with flow adjustment knob Non-return valve Fitting and pipe to connect an additional inert gas package. Gas outlet = 6 mm braided hose with 6 mm union
30.	Tube guards and tube supports	Guards and horizontal tube support for extended length work tube for operation in inert gas operation - 1 set.
31.	Max power (W)	Single Phase ≤ 2000 W
32.	Warranty	24 months from the date of commissioning and acceptance of equipment