KINTEK FURNACE

Mpcvd Catalog

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KINTEK FURNACE

COMPANY PROFILE

>>> About Us

Kintek Furnace is a technology-driven innovator specializing in precision high-temperature laboratory equipment, including muffle furnaces, tube furnaces, vacuum furnaces, atmosphere-controlled systems, and advanced CVD/PECVD solutions. Designed for materials science, chemical research, and thermal processing applications, our robust, energy-efficient systems prioritize precision, safety, and repeatability in extreme heat environments, empowering researchers and industrial labs to achieve groundbreaking results.

915Mhz Mpcvd Diamond Machine Microwave Plasma Chemical Vapor Deposition System Reactor

Item Number: MP-CVD-101

Introduction

KINTEK MPCVD Diamond Machine: High-quality diamond synthesis with advanced MPCVD technology. Faster growth, superior purity, customizable options. Boost production now!

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Microwave system (according to optional power supply)	• Operating frequency:915±15MHz • Output power:3-75kW continuously adjustable • Cooling water flow:120/min • System standing wave coefficient:VSWR≤1.5 • Microwave leakage:
Vacuum system and reaction chamber	• Leakage rate • The ultimate pressure is less than 0.7Pa (this machine comes with imported Pirani vacuum gauge) • The pressure rise in the cavity shall not exceed 50Pa after 12 hours of maintaining pressure. • Reaction chamber working mode: TM021 or TM023 mode • Cavity type: cooled cylindrical cavity, can carry power up to 75KW, high purity ,Stone ring seal. • Inlet method: Top sprinkler head inlet. • Observation temperature measurement window: 8 observation holes, evenly distributed horizontally. • Sampling port: bottom lifting sampling port
Sample holder system	• Sample stage diameter ≥200mm, single crystal effective use area ≥130mm,The effective use area of polycrystalline is ≥200mm. Substrate platform water-cooled sandwich structure, vertical straight up and down.
Gas system	• Full metal welded gas plate 5-7 gas lines • All internal air circuits of the equipment use welding or VCR connectors.
System cooling	• 3-way water cooling, real-time monitoring of temperature and flow. • System cooling water flow 120L/min, cooling water pressure
Temperature measurement method	• External infrared thermometer, temperature range 3001400 M

serial number	Module name	Remark
1	Microwave power supply	Standard domestic magnetron: Yingjie Electric / Distinguish power supply Domestic solid-state source: Watson (+30,000) Imported magnetron: MKS/ pastoral (+100, 000)
2	Waveguide, three pins, mode converter, upper resonator	Self made

3	Vacuum reaction chamber (upper chamber, lower chamber, connectors)	Self made
4	Infrared thermometers, optical displacement components, brackets	Infrared thermometers, optical displacement components, Fuji Gold Siemens + Schneider brackets
5	Water-cooling table motion components (cylinders, workpieces, etc.)	
6	Ceramic thin film vacuum gauge,Pirani vacuum gauge	Inficon
7	Vacuum valve components (ultra-high vacuum gate valve, precision pneumatic valve*2, electromagnetic vacuum charging differential valve)	Fujikin + Zhongke + Himat
8	Vacuum pump and connecting pipe fittings, tee, KF25 bellows*2, adapter	Pump: Flyover 16L
9	Metal microwave sealing ring*2; metal vacuum sealing ring*1; Quartz plate	Quartz: Shanghai FeilihuaSemiconductor Grade High Purity Quartz
10	Circulating water components (joints, diverter blocks, flow detectors)	Japanese SMC/CKD
11	Pneumatic part (CKD filter, airtac multi-way solenoid valve, pipe fittings and adapters)	
12	Gas connector, EP gas pipe, VCR connector, filter 0.0023μm *1, filter 10μm*2	Fujikin
13	Machine casing, stainless steel table, universal wheels, feet, bracket fastening screws, etc	custom processing
14	Gas flow meter*6 (including one pressure control)	Standard seven-star , optional Fuji Gold (+34,000) / Alicat (42,000)
15	Gas plate processing (5-way gas, filter*5, pneumatic valve*5, manual valve*6, pipeline welding)	Fuji Gold
16	PLC automatic control	Siemens + Schneider
17	Molybdenum table	

Mpcvd Machine System Reactor Bell-Jar Resonator For Lab And Diamond Growth

Item Number: KTMP315

Introduction

KINTEK MPCVD Systems: Precision diamond growth machines for high-purity lab-grown diamonds. Reliable, efficient, and customizable for research and industry.

Learn More

Microwave system	• Microwave frequency 2450±15MHZ, • Output power 1□10 KW continuously adjustable • Microwave output power stability: • Microwave leakage ≤2MW/cm2 • Output wave guide interface: WR340, 430 with FD-340, 430 standard flange • Cooling water flow: 6-12L/min • System standing wave coefficient: VSWR ≤ 1.5 • Microwave manual 3 pin adjuster, excitation cavity, high-power load • Input power supply: 380VAC/50Hz ± 10%, three-phase
Reaction chamber	• Vacuum leakage rate • The limit pressure is less than 0.7 Pa(Standard setup with Pirani vacuum gauge) • The pressure rise of chamber shall not exceed 50Pa after 12 hours of pressure maintaining • Working mode of reaction chamber: TM021 or TM023 mode • Cavity type: Butterfly resonant cavity, with maximum bearing power of 10KW, made of 304 stainless steel, with water-cooled inter-layer, and high purity quartz plate sealing method. • Air intake mode: Top annular uniform air intake • Vacuum sealing: The bottom connection of the main chamber and the injection door are sealed with rubber rings, the vacuum pump and bellows are sealed with KF, the quartz plate is sealed with a metal C-ring, and the rest are sealed with CF • Observation and temperature measurement window: 4 observation ports • Sample load port in front of chamber • Stable discharge within the pressure range of 0.7KPa~30KPa (the power pressure shall be matched)
Sample holder	• Diameter of sample table≥70mm, effective use area≥64 mm • Base plate platform water-cooled sandwich structure • Sample holder can be lifted and lowered evenly electrically in the cavity
Gas flow system	• All metal welding air disk • Welding or VCR joints shall be used for all internal gas circuits of the equipment. • 5 channels MFC flow meter, H2/CH4/O2/N/Ar. H2: 1000 sccm ;CH4:100 sccm; O2: 2 sccm; N2: 2 sccm; Ar: 10 sccm • Working press 0.05-0.3MPa, accuracy ±2% • Independent Pneumatic valve control for each channel flow meter
Cooling system	• 3 lines water cooling, real-time monitoring of temperature and flow. • The system cooling water flow is ≤ 50L/min • The cooling water pressure is
Temperature sensor	• The external infrared thermometer has a temperature range of 300-1400 ℃ • Temperature control accuracy

Control system	• Siemens smart 200 PLC and touch screen control are adopted. • The system has a variety of programs, which can realize the automatic balance of growth temperature, accurate control of growth air pressure, automatic temperature rise, automatic temperature drop and other functions. • The stable operation of the equipment and comprehensive protection of the equipment can be achieved through the monitoring of water flow, temperature, pressure and other parameters, and the reliability and safety of the operation can be guaranteed through functional interlocking.
Optional function	• Center monitoring system • Substrate basing power

Cylindrical Resonator Mpcvd Machine System For Lab Diamond Growth

Item Number: KTWB315

Introduction

KINTEK MPCVD Systems: Grow high-quality diamond films with precision. Reliable, energy-efficient, and beginner-friendly. Expert support available.

Learn More

Microwave system	• Microwave frequency 2450±15MHZ, • Output power 1□10 KW continuously adjustable • Microwave output power stability: • Microwave leakage ≤2MW/cm2 • Output wave guide interface: WR340, 430 with FD-340, 430 standard flange • Cooling water flow: 6-12L/min • System standing wave coefficient: VSWR ≤ 1.5 • Microwave manual 3 pin adjuster, excitation cavity, high-power load • Input power supply: 380VAC/50Hz ± 10%, three-phase
Reaction chamber	• Vacuum leakage rate • The limit pressure is less than 0.7 Pa(Standard setup with Pirani vacuum gauge) • The pressure rise of chamber shall not exceed 50Pa after 12 hours of pressure maintaining • Working mode of reaction chamber: TM021 or TM023 mode • Cavity type: Cylindrical resonant cavity, with maximum bearing power of 10KW, made of 304 stainless steel, with water-cooled inter-layer, and high purity quartz plate sealing method. • Air intake mode: Top annular uniform air intake • Vacuum sealing: The bottom connection of the main chamber and the injection door are sealed with rubber rings, the vacuum pump and bellows are sealed with KF, the quartz plate is sealed with a metal C-ring, and the rest are sealed with CF • Observation and temperature measurement window: 8 observation port • Sample load port in front of chamber • Stable discharge within the pressure range of 0.7KPa~30KPa (the power pressure shall be matched)
Sample holder	• Diameter of sample table≥72mm, effective use area≥66 mm • Base plate platform water-cooled sandwich structure • Sample holder can be lifted and lowered evenly electrically in the cavity
Gas flow system	• All metal welding air disk • Welding or VCR joints shall be used for all internal gas circuits of the equipment. • 5 channels MFC flow meter, H2/CH4/O2/N/Ar. H2: 1000 sccm ;CH4:100 sccm; O2: 2 sccm; N2: 2 sccm; Ar: 10 sccm • Working press 0.05-0.3MPa, accuracy ±2% • Independent Pneumatic valve control for each channel flow meter
Cooling system	• 3 lines water cooling, real-time monitoring of temperature and flow. • The system cooling water flow is ≤ 50L/min • The cooling water pressure is
Temperature sensor	• The external infrared thermometer has a temperature range of 300-1400 ℃ • Temperature control accuracy

Control system	• Siemens smart 200 PLC and touch screen control are adopted. • The system has a variety of programs, which can realize the automatic balance of growth temperature, accurate control of growth air pressure, automatic temperature rise, automatic temperature drop and other functions. • The stable operation of the equipment and comprehensive protection of the equipment can be achieved through the monitoring of water flow, temperature, pressure and other parameters, and the reliability and safety of the operation can be guaranteed through functional interlocking.
Optional function	• Center monitoring system • Substrate basing power

Hfcvd Machine System Equipment For Drawing Die Nano Diamond Coating

Item Number: HFCVD-100

Introduction

KINTEK's HFCVD system delivers high-quality nano-diamond coatings for wire drawing dies, enhancing durability with superior hardness and wear resistance. Explore precision solutions now!

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Comparation table between traditional and nano diamond coated drawing die

HFCVD technical composition		
Technical Parameters	Equipment composition	System Configuration
Bell Jar: Dia. 500mm, Height 550mm, SUS304 stainless steel chamber; inner stainless steel skin insulation, lifting height is 350mm;	A set of vacuum chamber (bell jar) main body (jacketed water-cooling structure)	Vacuum chamber (bell jar) main body;The cavity is made of high-quality 304 stainless steel; Vertical bell jar: the jacketed water-cooling jacket is installed on the overall periphery of the bell jar. The inner wall of the bell jar is insulated with stainless steel skin, and the bell jar is fixed on the side . Accurate and stable positioning ; Observation window: horizontally arranged in the middle of the vacuum chamber 200mm Observation window, water cooling, baffle, side and upper configuration 45 Degree bevel angle, 50° observation window (observe the same point as the horizontal observation window, and the sample supporting platform); the two observation windows maintain the existing position and size.Bell jar bottom is 20mm higher than the plane of the bench , set cooling; the holes reserved on the plane, such as large valves, air release valves, air pressure measurement, bypass valves, etc., are sealed with metal mesh and reserved for installing electrodes Interface;
Equipment table: L1550* W900*H1100mm	One set of drag sample table device (adopting double-axis drive)	Sample holder device: Stainless steel sample holder (welding water cooling) 6- position device; it can be adjusted separately, only up and down adjustment, the up and down adjustment range is 25mm, and the left and right shaking is required to be less than 3% when going up and down (that is, the left and right shaking of rising or falling by 1mm is less than 0.03mm) , and the sample stage does not rotate when rising or falling.
Ultimate vacuum degree: 2.0×10-1Pa ;	A set of vacuum system	Vacuum system: Vacuum system configuration: mechanical pump + vacuum valve + physical bleed valve + main exhaust pipe + bypass; (provided by the vacuum pump supplier), the vacuum valve uses a pneumatic valve; Vacuum system measurement: Membrane pressure.
Pressure rise rate : ≤5Pa/h;	Two channels mass flow meter gas supply system	Gas supply system: The mass flow meter is configured by Party B, two-way air intake, the flow rate is controlled by the mass flow meter, after the two-way meeting, it enters the vacuum chamber from the top , and the inside of the air intake pipe is 50mm
Sample table movement: up and down range is ± 25m; it is required to shake left and right ratio when up and down by ± 3%;	One set of electrode device (2 channels)	Electrode device: The length direction of the four electrode holes is parallel to the length direction of the support platform, and the length direction is facing the main observation window with a diameter of 200mm .
Working pressure: use membrane gauge pressure gauge, measuring range: 0 ~ 10kPa; work constant at 1kPa ~5kPa,the constant pressure value changes plus or minus 0.1kPa;	A set of cooling water system	Cooling water system: The bell jar, electrodes, and bottom plate are all equipped with circulating water cooling pipelines, and are equipped with insufficient water flow alarm device 3.7: control system. Switches, instruments, instruments and power supply for bell lifting, deflation, vacuum pump, main road, bypass, alarm, flow, air pressure, etc. are set on the side of the stand, and are controlled by a 14 -inch touch screen; the equipment has a fully automatic control program without manual intervention, and can store data and call data
Air intake position: air intake at the top of the bell jar, and the position of the exhaust port is located directly below the sample holder;	Control system	

Control System: PLC controller + 10-inch touch screen	A set of automatic pressure control system (original pressure control valve imported from Germany)	
Inflation system: 2 channels mass flow meter, flow range: 0-2000sccm and 0-200sccm; Pneumatic valve valve	Resistance Vacuum Gauge	
3.1.10 Vacuum pump: D16C vacuum pump		

Technical indicators	Traditional drawing die	Nano-diamond coated drawing die
Coating Surface Grain Size	none	20~80nm
Coating diamond content	none	≥99%
Diamond Coating Thickness	none	10 ~ 15mm
Surface roughness	Ra≤0.1mm	Class A: Ra≤0.1mm Class B: Ra≤0.05mm
Coating drawing die inner hole diameter range	Φ3 ~ Φ70mm	Φ3 ~ Φ70mm
Service life span	Life span depends on working conditions	6-10 times longer
Surface friction coefficient	0.8	0.1

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