Cylindrical Resonator Mpcvd Machine System Reactor For Microwave Plasma Chemical Vapor Deposition And Lab Diamond Growth

Item Number: KTWB315

Introduction

Learn about Cylindrical Resonator MPCVD Machine, the microwave plasma chemical vapor deposition method used for growing diamond gemstones and films in the jewelry and semi-conductor industries. Discover its cost-effective advantages over traditional HPHT methods.

Learn More

Microwave system	• Microwave frequency 2450±15MHZ, • Output power 1□ 10 KW continuously adjustable • Microwave output power stability: <±1% • 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<5 × 10-9 Pa .m3/s • 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<4KG, and the inlet water temperature is 20-25 ℃.

Temperature sensor	• The external infrared thermometer has a temperature range of 300-1400 ℃ • Temperature control accuracy < 2 ℃ or 2%
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