

SPS/DCS放电等离子烧结系统

Spark Plasma Sintering System

Technical Features

产品特点

- 快速升温,快速冷却,大幅缩短生产时间,降低生产成本(升温速率可达100~200°C/min);

Rapid heating and cooling, greatly shortening production time and reducing production costs (heating rate can reach 100 ~ 200°C / min).

- 自主开发的高效节能型电源

Self-developed high efficiency and energy saving power supply
采用了自主开发的脉冲变频DC电源,电流输出稳定,耗电量大幅降低,节能环保。

Adopting self-developed pulse frequency conversion DC power supply, The current output is stable and the power consumption is greatly reduced, energy saving and environmental protection.

- 精确的加压控制系统

Precise pressure control system

采用伺服阀控制液压缸压力输出,控制精度可达千分之一。

Servo valve is used to control the pressure output of the hydraulic cylinder, and the control accuracy can reach 1/1000.

- 先进的测温系统

Advanced temperature measurement system

采用热电偶和双色红外仪两种方式测温。

Thermocouple and two-color infrared instrument are used to measure the temperature.

- 先进的自动控制及可靠的安全联锁

Advanced automatic control and reliable safety interlock

采用计算机实现温度、动作过程全自动控制、PLC实现安全联锁,具有超压、超温水温过高等声光报警及联锁工能。

Adopting computer to realize automatic control of temperature and action process, PLC safety interlock. It has sound and light alarm and interlock function such as over-pressure, over-temperature and high water temperature.



Application

应用

- 纳米材料可以在无明显晶体生长的情况下被烧结
Sintered nanomaterial without significant grain growth.
- FGM (“功能性梯度材料”)
FGM (Functionally Graded Materials).
- 复合材料
Composite materials.
- 创新性的硬质合金
Innovative carbide metals.
- 铝和铜合金以及金属间化合物
Aluminum and copper alloys as well as intermetallic compounds.
- 结构性和功能性陶瓷
Structural and functional ceramics.

技术规格 / Main Specification

参数Spec.	型号Model	VHPsp-6/18-2400(Smini)	VHPsp-9/20-2400(S1)	VHPsp-12/25-2400(S2)	VHPsp-20/30-2400(S3)
设备装料方式 Equipment Loading Method	侧开门装料 Horizontal side loading				
最大加热功率 Max. Power	30KW±10%		60KW±10%	100KW±10%	160KW±10%
输出电压 Output Voltage	0 ~ 10V				
输出电流 Output Current	0 ~ 3000A		0 ~ 6000A	0 ~ 10000A	0 ~ 16000A
脉冲参数 Pulse Control	开通时间1-255ms任意可调, 关断时间1-255ms任意可调 / ON/1~255ms OFF/1~255ms				
最高工作温度 Max. Sintering Temp	2400°C (该温度根据烧结材料电阻不同会有变化) 2400°C (The temperature will change according to the resistance of the sintered material)				
样品直径 Product Diameter	≤φ15mm	≤φ30mm		≤φ50mm	≤φ80mm
模具外径 Mold Diameter	≤φ60mm	≤φ90mm		≤φ120mm	≤φ200mm
压头开放高度 Open Height	180mm	200mm		250mm	300mm
压头行程 Z-axis stroke	80mm	100mm			150mm
位移精度 Displacement Accuracy	±0.005mm				
最大压力 Max. Pressure	29KN (3Ton)	49KN (5Ton)		98KN (10Ton)	245KN (25Ton)
压力控制 Pressure Control	伺服电机 Servo motor	伺服液压 Servo hydraulic			
压力精度 Pressure Accuracy	±0.1%				
加压方式 Pressure method	单向加压, 下加压 Single-way pressure, bottom pressure				
极限真空度 Max. Vacuum	1Pa/8.0×10-4Pa (8.0×10-2 torr / 8.0×10-6 torr) Optional				
压升率 Pressure Rise Rate	≤ 2Pa/h				
控温及测温方式 Temperature Control and Measurement	PLC程序控温: 温度≤1000°C时, K型热电偶插入模具接触式测温; 温度>1000°C时, 双色红外仪非接触式测温 PLC program temperature: ≤1000°C with K-type thermal couple; >1000°C with infrared thermometer				
气氛系统 Gases	高纯氩气或高纯氮气, 充气压力≤0.02MPa (可调) High-purity argon or high-purity nitrogen, inflation pressure ≤0.02MPa (adjustable)				
冷却水要求 Cooling Water Requirement	压力0.2~0.4MPa, 4m³/h Water pressure 0.2 ~ 0.4MPa	压力0.2~0.4MPa, 5m³/h Water pressure 0.2 ~ 0.4MPa		压力0.2~0.4MPa, 8m³/h Water pressure 0.2 ~ 0.4MPa	
设备外形尺寸 Equipment External Dimensions	1350×1360×1650mm(W×D×H)	1350×1500×1900mm(W×D×H)	1550×1600×2200mm(W×D×H)	1700×2500×2400mm(W×D×H)	

