



Shanghai Duomu Industry Co., Ltd

- Introduction of Plasma Power Supply
- Introduction of Plasma
- Application case



Plasma Power Supply DML-VO2BD

- Plasma powder surfacing is an effective technique to improve the wear resistance and impact resistance on the surface of metal
- The process of PTA surfacing is to melting the alloy powder by the heat of plasma arc and the melt pool in the workpiece would change the features on the surface. The plasma arc has the natures of high heat, high efficiency, good stability and easy to control the depth of fusion etc
- Compared with MIG, laser, HVOF, PTA is affordable, flexible additional material formula, metallurgical bonding etc
- Low cost, economize on labor and consumables



POWER SUPPLY



Plasma Power Supply

Main Arc
Power Supply

01

Powder Feeder
System

02

Ion Beam
Controller

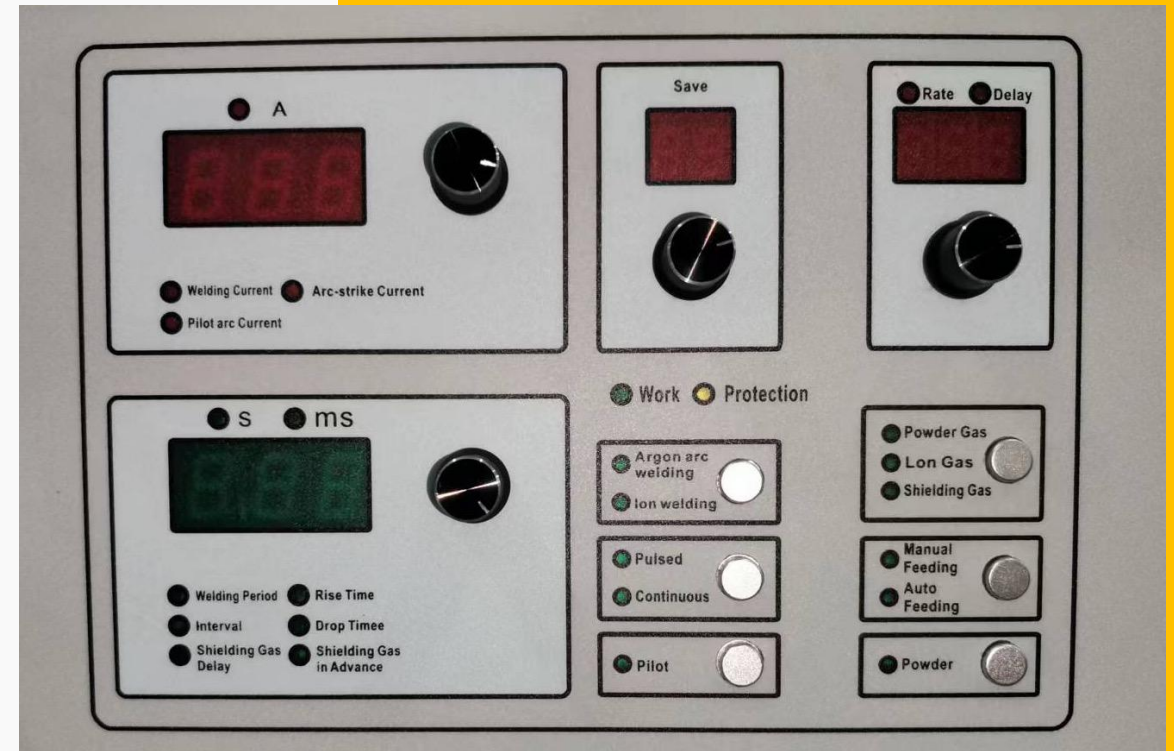
03

Torch
Cooling System

04

Characteristics of Plasma Power Supply DML - V02BD

- Digital programming control
- Digital inverter technology, IGBT power module
- High Voltage
- Aerodynamic design
- Storage function
- Dynamic welding
- Pulse function





Function

01
PART

Plasma continuous welding

02
PART

Plasma continuous pulse surfacing (Similar as Laser cladding)

03
PART

Argon arc continuous welding

04
PART

Argon arc continuous pulse

05
PART

Precise pulse welding (Similar as Laser welding)

Five functions



Laser welding

Laser cladding



The Features of Plasma Arc



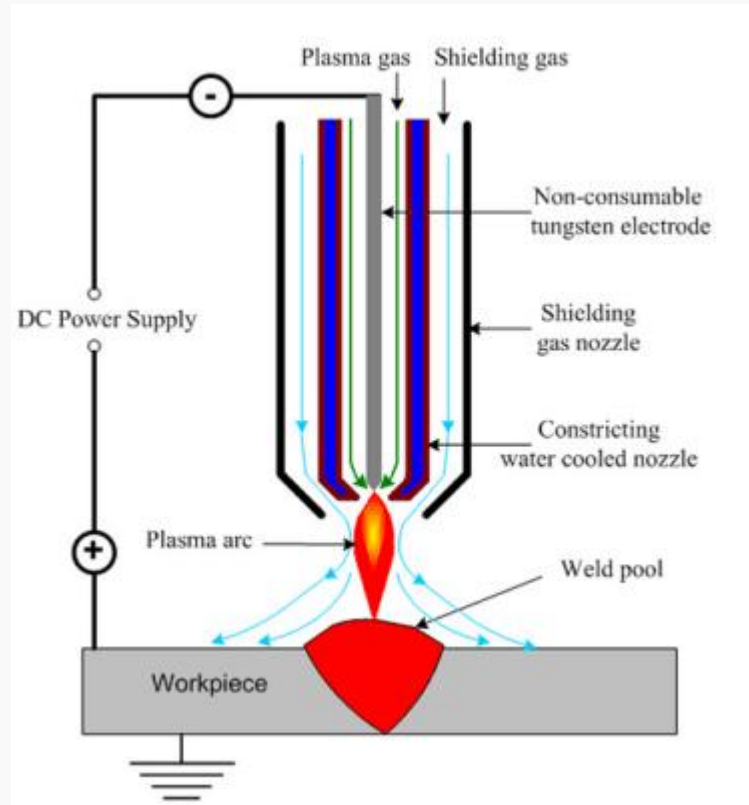
Pilot arc is auxiliary to starting main arc.



The heat source of ion arc is from main arc(transferred arc), which the temperature would be up to 16000-24000 °C

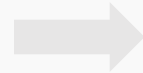
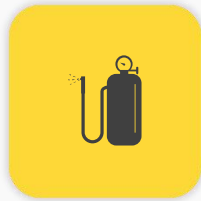


Ion beam would weld almost all metal material.





Principles and Characteristics



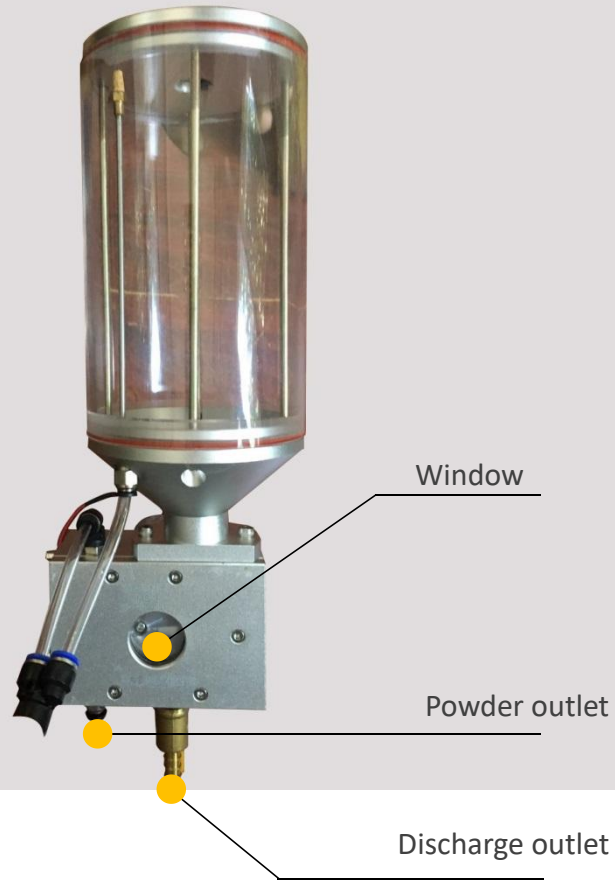
There are three compressed methods of the beam from the plasma torch: mechanical compression, gas compression and electromagnetic compression.

Plasma arc has high energy density, high arc column stiffness, which can avoid magnetic drift and is less affected by distance

▶ Powder feeding system

P Powder feeding system

Configuration with the powder feeding by impeller that would realize the feeding in advance and in lag to avoid the crack as extinguishing arc. ,



Powder feeding system



Torch



Plasma torch for outer



Plasma torch for inner

DML-V02BD: One power supply covers one torch



The advantages of die-casting powder welding torch

Torch DMD100 with small size is proper for welding small bore and the water cooling directly is proper for working for a lon time.

1

High air tightness

2

High insulation

3

High temperature resistance

4

Low failure rate

Good insulation to avoid electric shock of workers.





Applicable base metal range

Welding machine parameters

A

This power supply for DC can be used for pearlite, ferrite, lower bainite, austenite, plate martensite and other ferrous metals.

Plasma surfacing is a fine crystalline surface strengthening process, which has a stirring effect on the molten pool, can fine grains and uniform structure composition, and has obtained more wear resistance, corrosion resistance, high temperature oxidation resistance and other properties.

B

Parameters	DML-V02BD			
	Ion welding		Argon welding	
	Continuous	Pulse	Continuous	Pulse
Pilot arc current (A)	2-10			
Welding current (A)	2-125		2-125	2-200
Base value current (A)	2-110		2-110	
Current lift time (s)	0-2.0		0-2.0	
Current fall time (s)	0-2.0		0-2.0	
Pulse welding time (ms)		1-999		1-999
Welding gap time (ms)		10-990		10-990
Powder feeding advance time (s)	0-5			
Powder feeding lag time (s)	0-5			
Gas shield time (s)	1.0-20.0		1 - 20.0	
Input voltage (V)	AC220V, 50HZ			
Rate input power capacity (KVA)	6			
Duty cycle (%)	90%			
Weight(KG)	46			
Dimension (mm)	500*400*1400			



The report of Wear resistance test



洛阳金鹭硬质合金工具有限公司干沙/橡胶轮耐磨性测试

ASTM G65 - Procedure A

样品名称: 截齿用等离子堆焊粉
试样编号: HS160406
实验编号: 161215
是否热处理: N/A
硬度: N/A
表面粗糙度: N/A

实验人员: 朱显东
日期: 15/12/2016

橡胶轮直径: Below
橡胶轮宽度: 12.7mm
橡胶轮硬度: A-60(邵氏硬度)

等离子堆焊机型号	DML-V02BD
堆焊电流	75A
试样编号: (Test No.)	HS160406
测试力: (Test Load)	30 Lbf 135N
轮转数: (Wheel Revolutions)	6,000
沙流速: (Sand Flow, g/min)	330
测试前重量: (Initial Mass, g)	149.044
测试后重量: (Final Mass, g)	148.829
质量损失: (Mass Loss, g)	0.210
密度: (Density, g/cm ³)	N/A
体积损失: (Volume Loss, mm ³ (mass loss/density) x 1000)	N/A
轮直径 (测试后): Wheel Diameter, mm (after use)	228.3
最大磨损深度: (Maximum Wear Scar Depth, mm)	N/A
最终结果: (Adjusted Mass Loss, g)	0.215



硬度: 58.5HRC

总结: 耐磨程度明显, 比原有 42CrMo 材料提高 3.7 倍

审核: 张兆强

审批: 孙志鹏



Supplies



TINCIDUNT LAOREET DOLORE MAGNA ALIQUAM ERAT

SUPPLIES

Auxiliary supplies

Cooling water、Argon、Power source

Main supplies

Alloy powder、Welding wire

Some objects can't draw into wire due to the physical properties. However, the alloy powder would cover all wire. The advantages of the alloy powder are low cost, uniform bead, efficiency that is approved more and more by the customers.



Typical Application



Typical application

S

Iron and steel

E

Electricity

P

Petrochemical

M

Mining machinery



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