

Product Data Sheet

Metco 8MB High Power Plasma Spray Gun

A high power, high voltage and high enthalpy plasma spray gun, robustly designed for long spray campaigns.

The Metco™ 8MB offers the ultimate in power and robustness, even in the most challenging environments, with operation up to 110 kW when argon/nitrogen is used as the processing gases. The advanced design features of the 8MB, unavailable on any other dedicated thermal spray gun, set new standards for effectiveness and efficiency.

The 8MB is a machine-mounted, single cathode, plasma gun developed for applications where high power is required. The high energy capability of the gun makes it the ideal tool to spray dense ceramic materials, such as thermal barrier coatings as well as other materials where additional energy is needed to achieve the required coating quality. The hardened construction of the 8MB will allow the gun to operate reliably using typical standard parameters for up to 20 hours without the need to replace consumable components.



1 General Description

The 8MB can operate at power levels up to 110 kW. It employs argon as the primary process gas, which can be used in combination with nitrogen, hydrogen or helium as a secondary gas. Typical parameter power is at 63 kW, using the standard electrode and plasma power supply.

High energy parameters of 100 kW and higher require nitrogen as the secondary gas and the optional high-power electrode. A high-power plasma power supply and proper cooling water are also required. Power levels of 70 kW can be achieved using hydrogen as the secondary gas and the optional high-power electrode.

The gun comes with the standard, thorium-free electrode as well as three sets of powder ports: #2, #3 and #4. The standard #4 ports are suitable for most parameters. Injector sets and injector holders are interchangeable.

Integrated air jets provide workpiece cooling. An air-assisted faceplate minimizes powder build-up on the nozzle face. An optional 5-degree front gun body assembly is available that prevents build-up on the nozzle face and powder ports when spraying ceramics.

1.1 Main Components

Item Description

Front Section

1	Air ring assembly
2	Air jets
3	Anode housing
4	Powder ports
5	Powder stems
6	Water jackets
7	Nozzle
8	Electrode

Middle Section

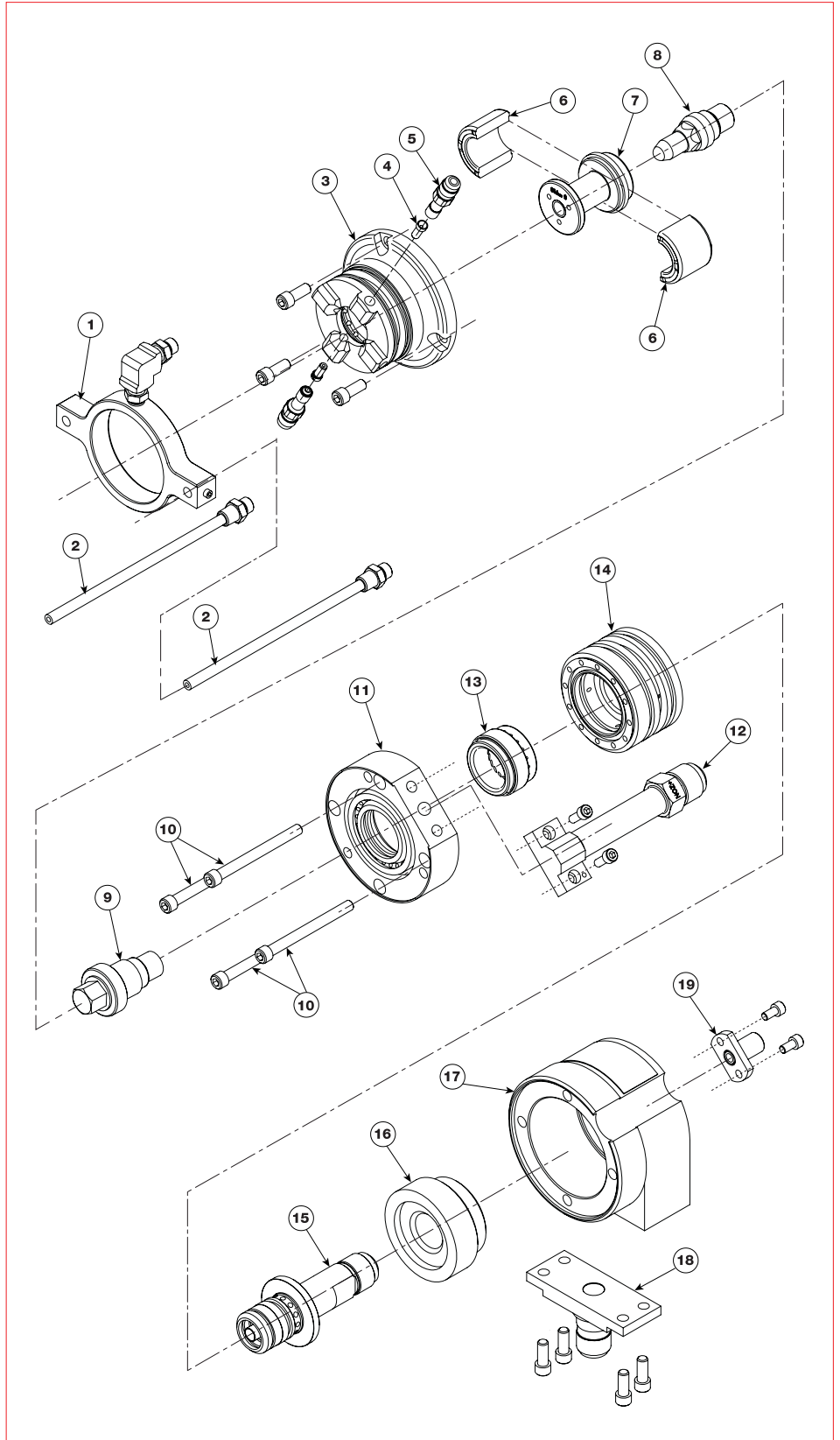
9	Anode alignment tool
10	Socket head cap screws
11	Middle gun body
12	Positive nozzle hose adapter
13	Gas ring
14	Middle insulator

Rear Section

15	Electrode holder
16	Rear insulator
17	Rear gun body
18	Mounting bracket (tool post)
19	Plasma gas fitting

Notes:

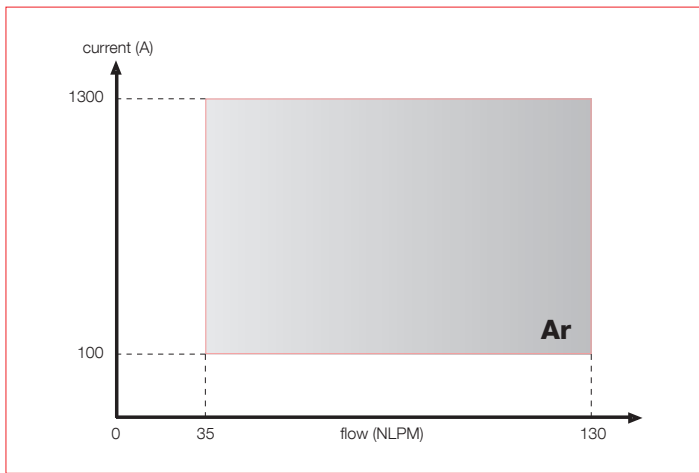
- O-rings are not shown
- Most screws are shown but not identified
- For a complete listing, please refer to the Metco 8MB product manual and/or parts list



1.2 Process Gas Combinations*

Argon Only Operation

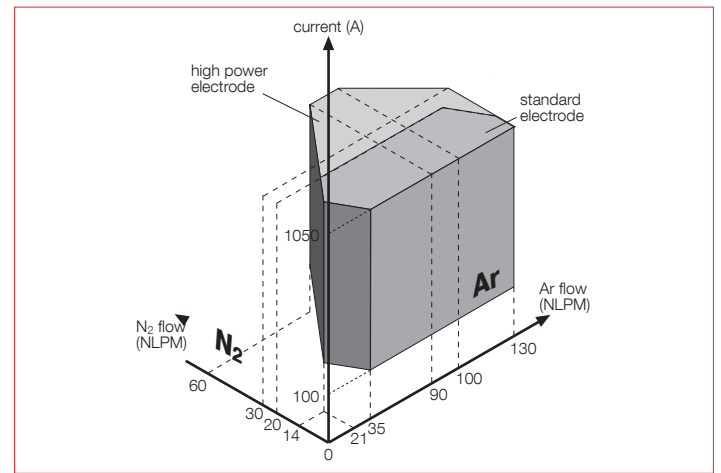
Process Gas	NLPM	SCFH
Argon	35 – 130	80 – 297



Argon / Nitrogen Operation

Process Gas	NLPM	SCFH
Argon	21 – 130	48 – 297
Nitrogen (standard electrode)	0 – 20	0 – 47
Nitrogen (high power electrode)	0 – 70	0 – 160

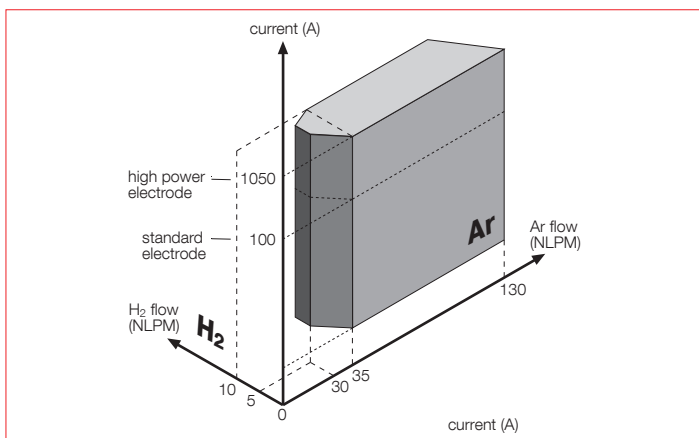
Argon/Nitrogen flow ratio: > 1.5



Argon / Hydrogen Operation

Process Gas	NLPM	SCFH
Argon	30 – 130	68 – 297
Hydrogen	0 – 10	0 – 23

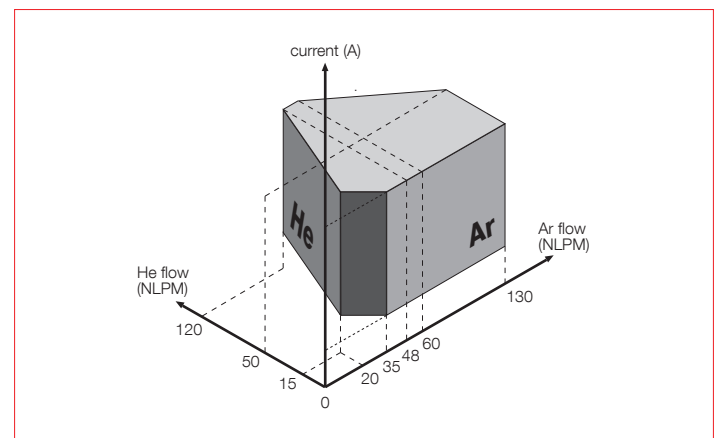
Argon/Hydrogen flow ratio: > 3.5



Argon / Helium Operation

Process Gas	NLPM	SCFH
Argon	20 – 130	46 – 297
Helium	0 – 120	0 – 274

Argon/Helium flow ratio: > 0.4



* More detailed information can be found in the Metco 8MB product manual

2 Features and Benefits

Effective:

- High power capability (up to 110 kW using Ar/N₂)
- Can be operated at standard power or high power mode
- Applies high quality TBCs, ceramic abrasives and associated bond coats
- Integrated air jets keep coated surfaces clean and cool.
- Gun power cables are threaded differently to prevent improper cable connection
- Air-assisted faceplate reduces powder build up on nozzle face
- Choice of process gases for flexible parameter development in standard power mode (Ar, ArN₂, ArH₂ or ArHe)

Efficient:

- High power applies coatings 2 to 3 times faster than other plasma spray guns, saving processing time
- Operates for long periods of up to 20 hours, using standard parameters, without replacement of consumable components
- High deposition efficiencies and spray rates

Economical:

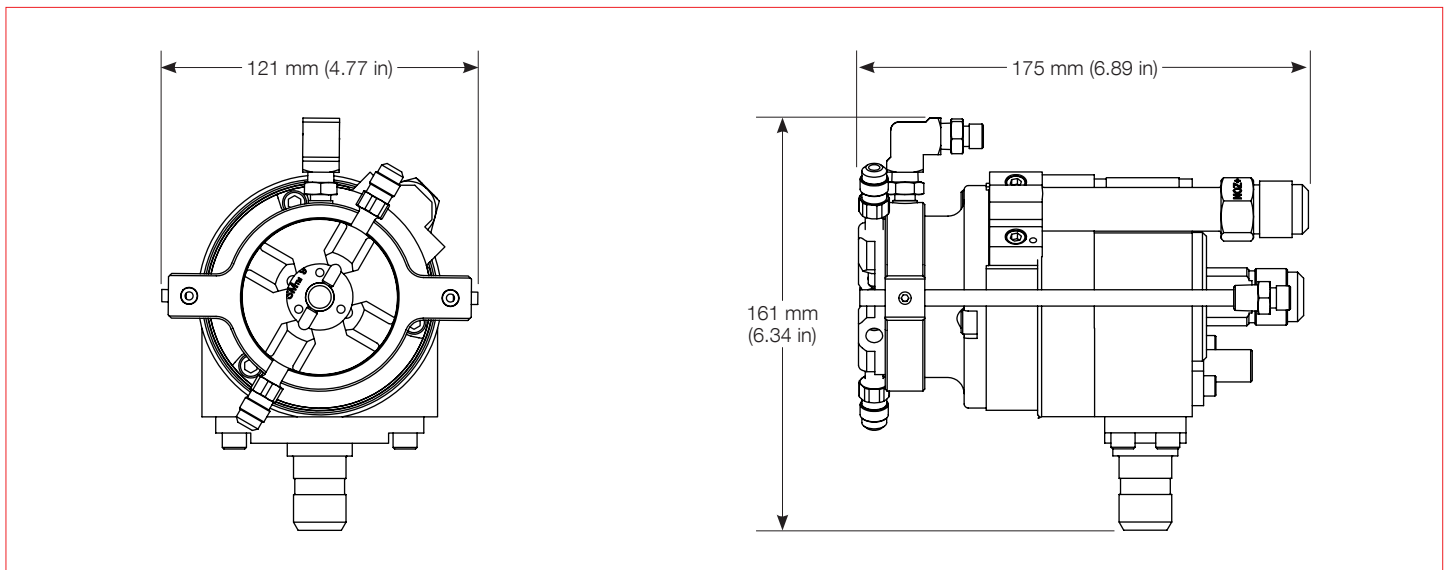
- Can use low-cost nitrogen as a secondary gas to achieve the highest power parameters
- Nozzles are quickly changed for minimal downtime.
- Low operating cost per hour

3 Options and Accessories

High Power Electrode: Thorium-free electrode, model 8MB57709(TF), required for high energy operation using ArN₂ above 100 kW or operation above 730 A using ArH₂. Order no. 1088090.

4 Technical Data

4.1 Dimensions



4.2 Specifications

Power rating (measured at gun)

Standard electrode (with ArN ₂)	80 kW
High power electrode (with ArN ₂)	110 kW

Weight

Without hoses and cables	4.13 kg	9.1 lb
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Plasma Gas Quality

Argon (Ar)		
Minimum quality	99.95 %	
European standard	99.998 %	
Helium (He)		
Minimum quality	99.995 %	
European standard	99.996 %	
Nitrogen (N ₂)		
Minimum quality	99.7 %	
European standard	99.996 %	
Hydrogen (H ₂)		
Minimum quality	99.95 %	
European standard	99.998 %	

Cooling Water

Inlet temperature	18 to 22 °C	65 to 72 °F
Outlet temperature (maximum)	50 °C	122 °F
Inlet pressure		
Standard power operation	9.7 bar	140 psi
High power operation	13.8 – 17 bar	200 – 250 psi
Flow (minimum)	> 18.1 l/min	> 4.75 gal/min
Conductivity	< 5 µS	
Dissolved oxygen	< 10 ppm	
Hardness	< 10 ppm	
pH	6.6 – 7.0	

Plasma Controller Compatibility

9MC ^a , 9MCE ^a , MultiCoat™, UniCoatPro Plasma™

Powder Feeder Compatibility

9MP, 9MPE, 9MPE-CL20, Twin 120A, Twin 220A
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Power Supply Compatibility

80 kW max operation: 10MR-0X
110 kW max operation: 10MR-10X or PT-1320

Water Chiller Compatibility

OM-HE Reinforced Plus (with high capacity pump)

^a Modification is required for high energy operation