

Product Data Sheet Metco F4MB-XL Series

Metco™ F4MB-XL series plasma spray guns are the latest generation of Oerlikon Metco's F4MB, which have been redesigned for improved robustness, yet retain all aspects of the F4MB that have made these machine-mounted, atmospheric plasma spray guns customer favorites for decades.

Metco F4MB-XL series plasma guns are engineered for reliable performance and efficiently utilize the capabilities of the plasma spray process by producing high quality coatings that meet or exceed the requirements of many OEM specifications.

Designed for high performance and flexibility, Metco F4MB-XL series plasma guns meet the safety requirements for European CE installations.

Engineered for reliable, trouble-free operation, these guns are capable of depositing high-quality coatings of plasma



sprayed metals, metallic alloys, carbides, composites, lends, cermets, abrasives and oxide ceramics.

Customers can be confident that their Metco F4MB-XL series plasma gun will operate very reliably.

Oerlikon Metco spare parts for Metco F4MB-XL series guns are manufactured at our ISO 9001-certified plants, using stringent quality control procedures. Quality spare parts, designed for extended service life and safety, assure increased productivity and reproducible coatings.

1 General Description

Metco F4MB-XL series plasma spray guns are multi-purpose, machine-mounted air plasma spray guns for coatings applied to external surfaces.

Metco F4MB-XL series plasma spray guns can be operated with combinations of argon, hydrogen and helium plasma gases. Special nozzles are also available for use with nitrogen and nitrogen-hydrogen plasma gas mixtures.

Gun hardware is designed for versatile, safe and easy operation. Left and right threaded gun cable connectors eliminate the risk of accidental polarity reversal that could cause severe gun damage. Connections are enclosed within the gun cover, thus isolating them from the thermal spray environment and protecting the operator from electrical shock. Water is used as cooling medium.

Many multi-layered material applications can be applied without any hardware changes between bond coat and top-coat application.

Metco F4MB-XL series guns have been designed to operate efficiently at power levels up to 55 kW. When operating with a compatible Oerlikon Metco plasma control unit, electrical power, plasma gas pressure and flow, gun cooling water temperature and flow and air pressure are all constantly monitored and controlled by the Oerlikon Metco plasma control unit.

These guns produce high integrity coatings of metals, alloys, ceramics, carbides, cermets, abrasives, composites, blends and a full range of the comprehensive materials for atmospheric plasma spray supplied by Oerlikon Metco.

2 Available Gun Models

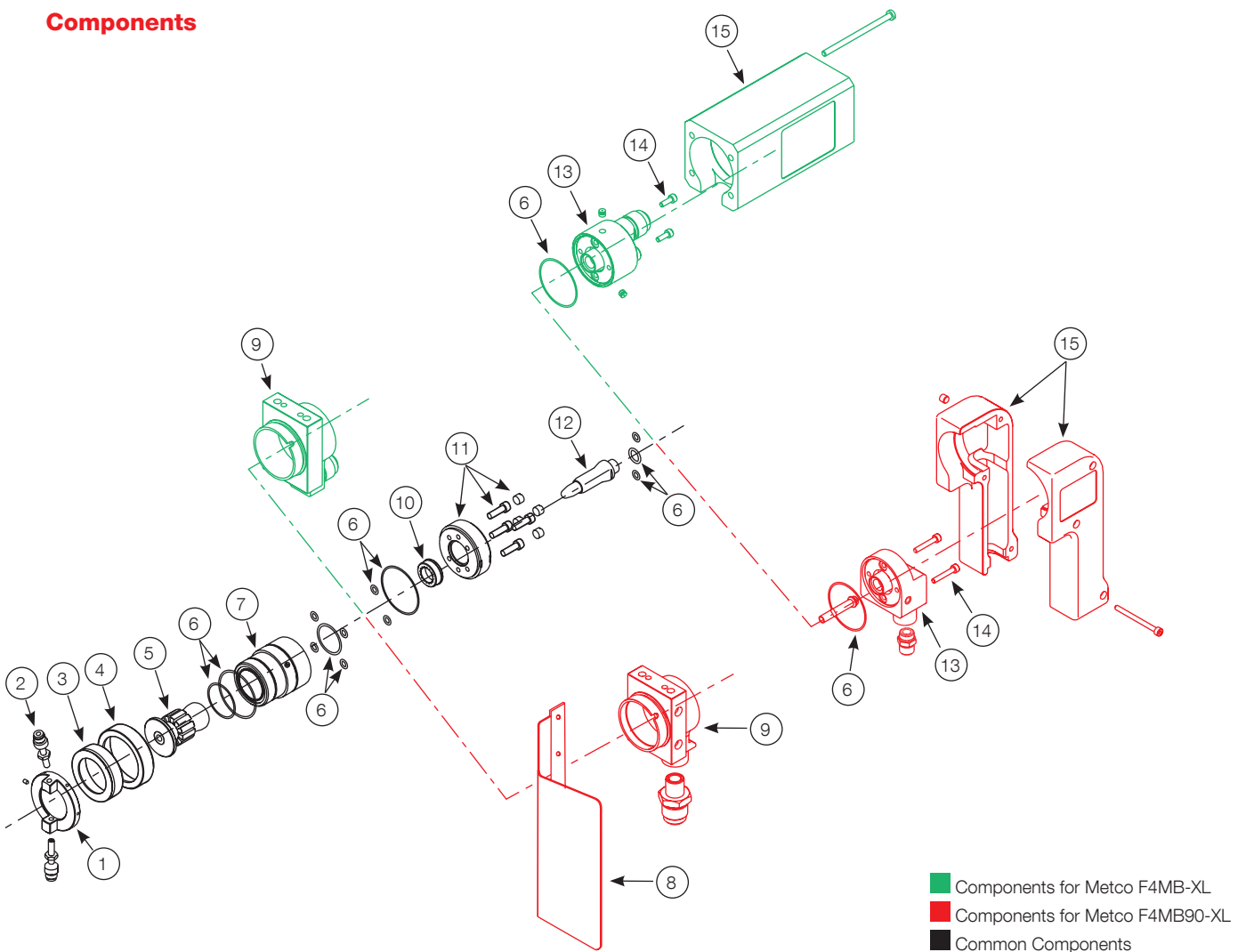
Two models are available for Metco F4MB-XL series guns, and either can be used in general purpose situations. The Metco F4MB-XL model is a straight-on (180°) spray gun. The Metco F4MB90-XL model is a right-angle (90°) spray gun. It is particularly useful for spraying larger inside bores.

The Metco F4MB-XL and Metco F4MB90-XL are direct replacements for the F4-MB and F4-HBS spray guns, respectively. Spray parameters and tool center points for Metco

F4MB-XL series guns are identical to their respective replacements, ensuring existing parameters and motion programs need not be changed.

Gun Model	Spray Angle	CE Conformance	Directly Replaces
Metco F4MB-XL	180°	Yes	F4-MB
Metco F4MB90-XL	90°	Yes	F4-HBS

3 Components



Balloon No.	Item Description
1	Powder injector holder (double)
2	Powder injector
3	Front locking ring
4	Rear locking ring
5	Nozzle (anode)

Balloon No.	Item Description
6	O-rings (various sizes and types)
7	Front gun body
8	Heat shield
9	Center gun body assembly
10	Gas distribution ring

Balloon No.	Item Description
11	Insulator assembly
12	Electrode (cathode)
13	Rear gun body assembly
14	Screws
15	Cover assembly

For complete part identification, please refer to the appropriate manual or parts list

4 Features and Benefits

Effective

- Power capability with optimized performance at levels up to 55 kW (100% duty cycle).
- High heat output capabilities with plasma gas temperatures up to 16000 °C (28880 °F).
- Applies PWA 257 coatings using the optional 257 nozzle.
- Versatile as a result of advanced technology that allows a broad range of application capabilities.
- Spray complex geometries: Long stand-off distance allows processing of parts where additional spray clearance is required.

Efficient

- Simple hardware configuration: sprays a wide range of materials with a single nozzle / electrode configuration. Optional hardware is available that extends the range of materials.
- Heat resistant cover: reduces cracking and melting from extended use.

- Classic F4MB mount design allows interchangeability with existing F4MB installations.
- Robust 8MH cable connection design integrated into gun body allows for interchangeability with F4MB installations, reduces the potential for water leaks during installation, removal and extended use, and also improves water flow and gun cooling.
- Fixed powder injection holders ensure proper powder injection angle and distance into the plasma plume.
- Compatible with SCR (silicon controlled rectifier) power supply units.

Economical

- Low maintenance resulting from an advanced design.
- Reduced production time resulting from higher powder feed rates
- Simple maintenance: nozzle, electrode and O-ring packages are available for quick and easy gun maintenance.

5 Adapters

The following adapters are required to connect the Metco F4MB-XL:

System / Component	Adapter	ID No.
MultiCoat / UniCoat with 8MH and current JAMBox	PTM15 plasma gas hose adapter	1002331
9MC with 9MCD	No adapters required	–
SG 100 system	SG-100 adapter kit	1070059
5MPE series or 9MP series powder feeders	Powder feed hose adapter	1002329

6 Accessories and Options

A wide range of accessories and optional parts are available for Metco F4MB-XL series guns:

Powder Injector (available in 1.5, 1.8 or 2.0 mm diameters)

- Standard undercut injector prevents buildup of powder on injector threads; for use with non-abrasive powders; 1.8 mm is standard, other diameters are optional.
- Optional hardened steel injectors for use with abrasive powders.
- Optional injectors with cemented carbide inserts resist abrasive wear.

Powder Injector Holder

- Holder with retaining screws provides greatest flexibility for the number of injectors, injector position and injector angle.
- Holder with securing ring provides higher heat transfer to the gun. Can be fixed radially in any position.

Anodes

- Standard with tungsten insert and cooling fins; available in 5, 6, 7, 8 mm diameters.

Air Jets for workpiece cooling

- Rigid, 90°
- Flexible, 90°
- Flexible, 60°

Air Jet Assembly

- Air Jet Assembly F4MBXL105268 (Order No. 1075441) has an efficient two-piece design that allows the air jets to be mounted on Metco F4MB-XL series plasma guns without removal of the injector holder.

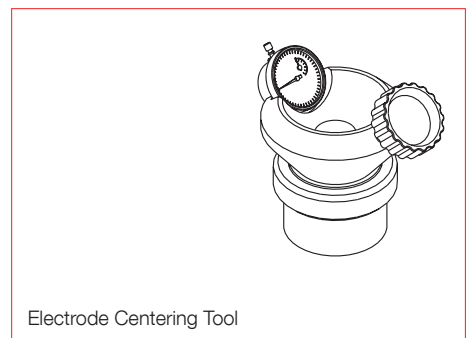
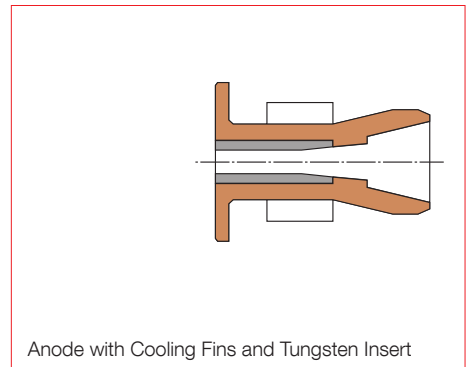
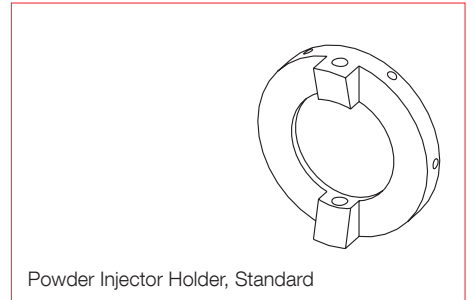
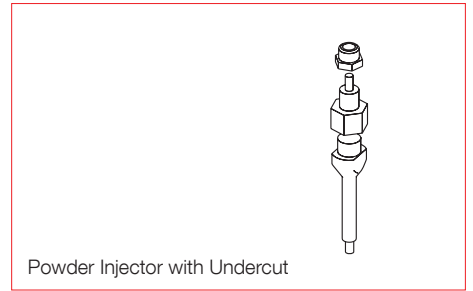
Hoses and Cables

- Cable package 4.5 m (15 ft) long, includes 5.8 m (19 ft) plasma gas hose.
- Cable package 7.6 m (25 ft) length, includes 9.1 m (30 ft) plasma gas hose.

Maintenance Tools

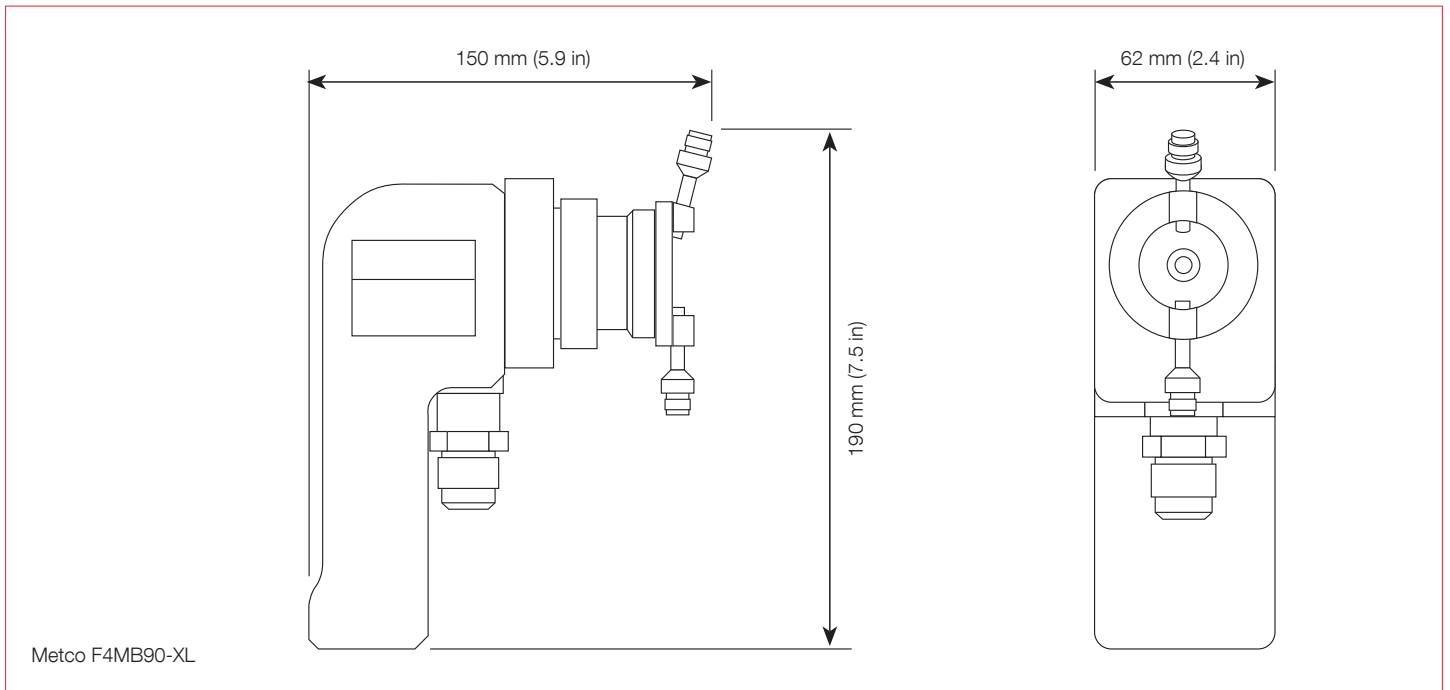
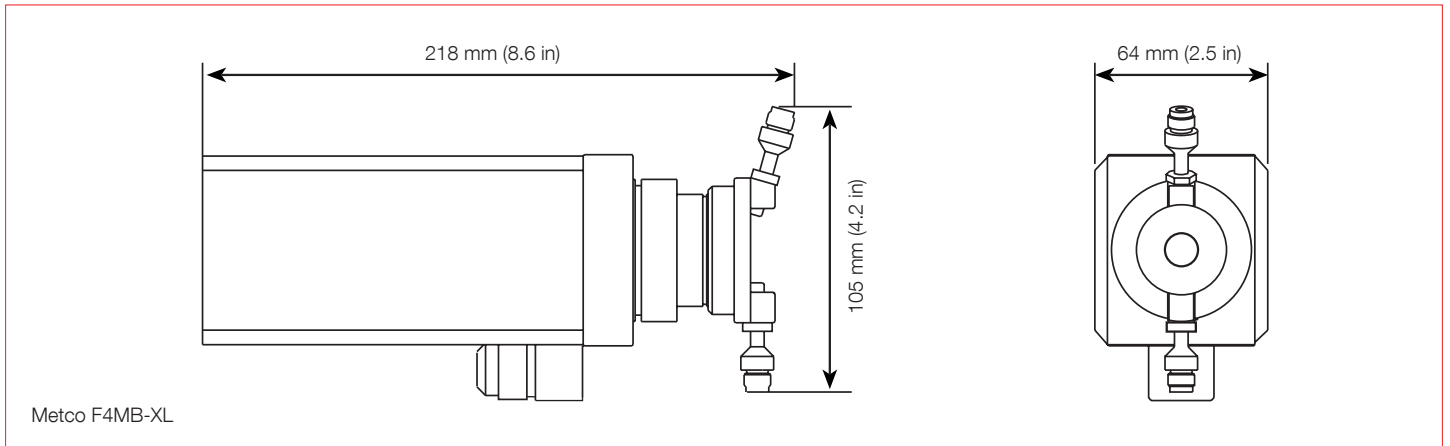
- Electrode centering tool optimizes gun hardware life.
- Powder injector distance gauge precisely defines distance of injector in relation to the plasma plume.

For a complete list of optional parts and spare parts please refer to the parts lists section of the reference manual.



7 Technical Data

7.1 Dimensions



7.2 Specifications

Power Rating

Power (100 % duty cycle)	55 kW
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Gas Quality

Argon – Ar

Minimum requirements	99.95 %
European standard	99.998 %

Helium – He

Minimum requirements	99.995 %
European standard	99.998 %

Hydrogen – H₂

Minimum requirements	99.995 %
European standard	99.998 %

Nitrogen – N₂

Minimum requirements	99.7 %
European standard	99.996 %

Cooling Water Requirements

Inlet temperature	15 to 25 °C	59 to 77 °F
Inlet pressure	13.5 bar	196 psi
Flow	10 to 14 l/min	2.6 to 3.7 gal/min
Total hardness	0.5 Grade F 0.35 Grade E 0.28 Grade D	
Conductivity max.	5 µS	

Deposit Efficiency

Typical	50 to 80 %
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Spray Rate

Typical	40 to 80 g/min	5.3 to 10.6 lb/h
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Weight

Approximately	2.5 kg	5.5 lb
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Compatibility

Controllers	Compatible with all Oerlikon Metco plasma controllers
Powder feeders	Compatible with all Oerlikon Metco powder feeders

Information is subject to change without prior notice.