

Product Data Sheet

Metco 9MC Series Controllers and Metco 9MCD Distribution Unit

The Metco™ 9MC Semi-Automatic Control Unit and Metco 9MCD Distribution Unit are designed for the atmospheric plasma spray process.

Metco 9MC series controllers are PLC-based systems that provide accurate and repeatable semi-automatic control, monitoring, and operation of Oerlikon Metco atmospheric plasma spray systems.

Two models of the Metco 9MC series controllers are available:

Metco 9MC: non-CE conformant
Metco 9MCE: CE conformant

The Metco 9MC is used in conjunction with the Metco 9MCD distribution unit, which is a free-standing, mobile unit that houses electric power and plasma gun cooling water connections.

The Metco 9MCE is used in conjunction with an appropriate Metco JAMBox. Please see Data Sheet DSE-0040 for more information.

Metco 9MC series controllers are multi-gas compatible devices that can accurately control plasma coating parameters using argon, nitrogen, helium, argon/hydrogen, nitrogen/hydrogen or argon/helium process gases.

An easy to read LED message display permits convenient, centralized monitoring of system operation status and alarm conditions. Messages include high water temperature, ignition failure, and low plasma gas flow. It displays self-diagnostic messages during alarm conditions to quickly identify the type of fault preventing normal operation.

Robotic gun and workpiece manipulation equipment, exhaust systems, and accessory controls are optionally interfaced with Metco 9MC series controllers to automate the entire plasma spray process. Two powder feeders can be connected for individual or simultaneous powder feed.

Multiple Metco 9MC series control units can be configured in “Master/Slave” configuration; a unique configuration that permits multiple Metco 9MC units to be interfaced together, allowing control of multiple guns from a single Metco 9MC operator console—a configuration ideal for high volume production environments.



Metco 9MCD Distribution Unit

Metco 9MC Atmospheric Plasma Spray Controller

1 General Description

A Metco 9MC series controllers are designed to interface to an Oerlikon Metco plasma spray gun as an integral part of a complete plasma spray system. It is capable of lighting the gun, adjusting the plasma plume to preset parameters and automatically starting the powder feeders. The control unit continuously monitors process gas and air supplies and is capable of shutting down the system if the conditions should change beyond safe operating limits.

At start-up, the Metco 9MC series controller will determine if the exhaust equipment is operating, verify that the plasma gases, powder carrier gas, and cooling air pressure are present and start the gas flow to the powder feeder. It will start the power supply, initiate cooling water from the cooling unit and verify that the water is circulating through the gun at the correct temperature. Once these checks are complete, it will turn on the primary plasma process gas to a preset flow and ignite the plasma gun.

During operation, the control unit will automatically ramp-up to preset coating parameters, and starts feeding of the coating material from the powder feeder. It continuously monitors plasma and powder carrier gas pressures, cooling water temperature and pressure, and cooling air pressure. It will stop the system in the event of unsafe operating conditions. Real time monitoring of process amperage and voltage are provided on convenient to read LED displays. Process voltage is measured directly at the plasma gun for improved accuracy. At normal system shut-down, the 9MC

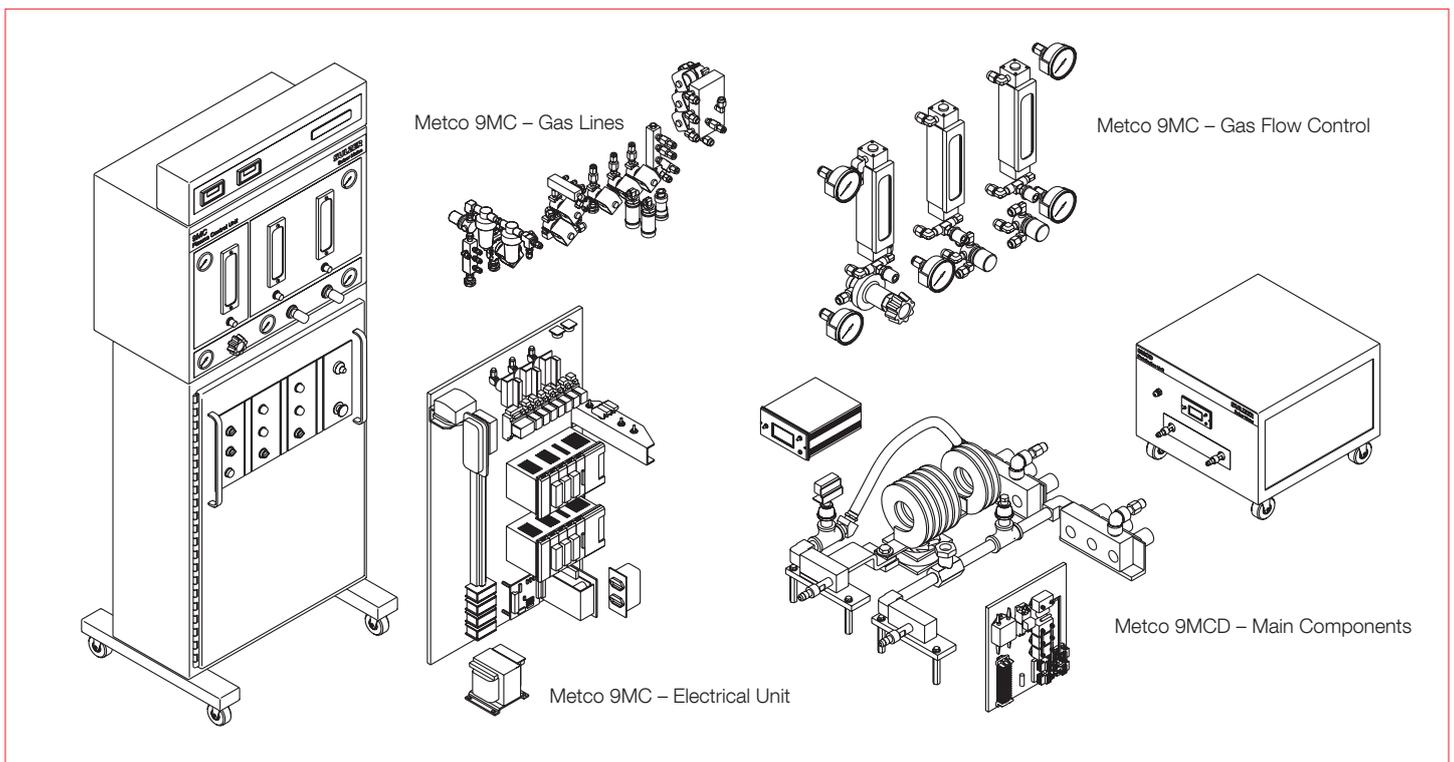
safely ramps down and shuts off all power, gas flows and connected equipment.

Metco 9MC series controllers are engineered with safety as an important design element. Electrical and gas cabinets are separated. An exhaust fan continuously ventilates the gas enclosure to prevent accumulation of gases in the event of accidental leakage.

A compressed air purge continuously keeps the electrical enclosure under partial pressure to guard against the entrance of spray dust or gases. The unit monitors the fan ventilation and compressed air purge preventing start-up or operation under unsafe conditions. Interlocks disconnects the line voltage if the controller door is opened during operation.

Standard connections on Metco 9MC series controllers permit the addition of four customer remote alarms, an exhaust system interlock and remote emergency stop control. Any number of emergency stop controls can be connected in the series to instantly stop operation.

The use of a separate Metco 9MCD distribution unit or Metco JAMBox has the advantage of allowing the Metco 9MC to be positioned close to the spray operation, eliminating the need for extra long cables, thus minimizing electrical power loss and improving water flow.



2 Features and Benefits

- Accurately and repeatedly controls plasma spray parameters for consistent coating quality.
- Large easy to read message center clearly displays all alarms for safe and simple operation.
- Self-diagnostics and monitoring of safe operating conditions, with alarms and system shut down in the event an unsafe condition occurs.
- Automatic plasma process start and stop minimizes cycle time, reducing gas and powder consumption.
- Interfaces with and controls additional plasma system components including exhaust equipment, workpiece and gun handling equipment and accessories.
- Up to two feeders can be connected to permit individual or simultaneous powder feed.
- Rotameters with true flow readout (in SCFH) and pressure gauges are large and easy to read.
- SCR compatible: operates with SCR (silicon controlled rectifier) power supply units
- Complete range of nozzle and powder port components – accommodates the majority of coating material and operation needs
- Operational with nitrogen as the primary plasma gas – offers economical operation with high heat output
- CE-conformity: the Metco 9MCE model meets European safety and operation requirements and is CE-conformant

3 Accessories and Options

Oerlikon Metco offers options that provide flexible configuration of the Metco 9MC series controllers with a variety of components to meet different customer production requirements. These include hoses, cables, gas regulators and interface modules. For a complete list of optional parts and spare parts, please refer to the parts lists section of the reference manual.

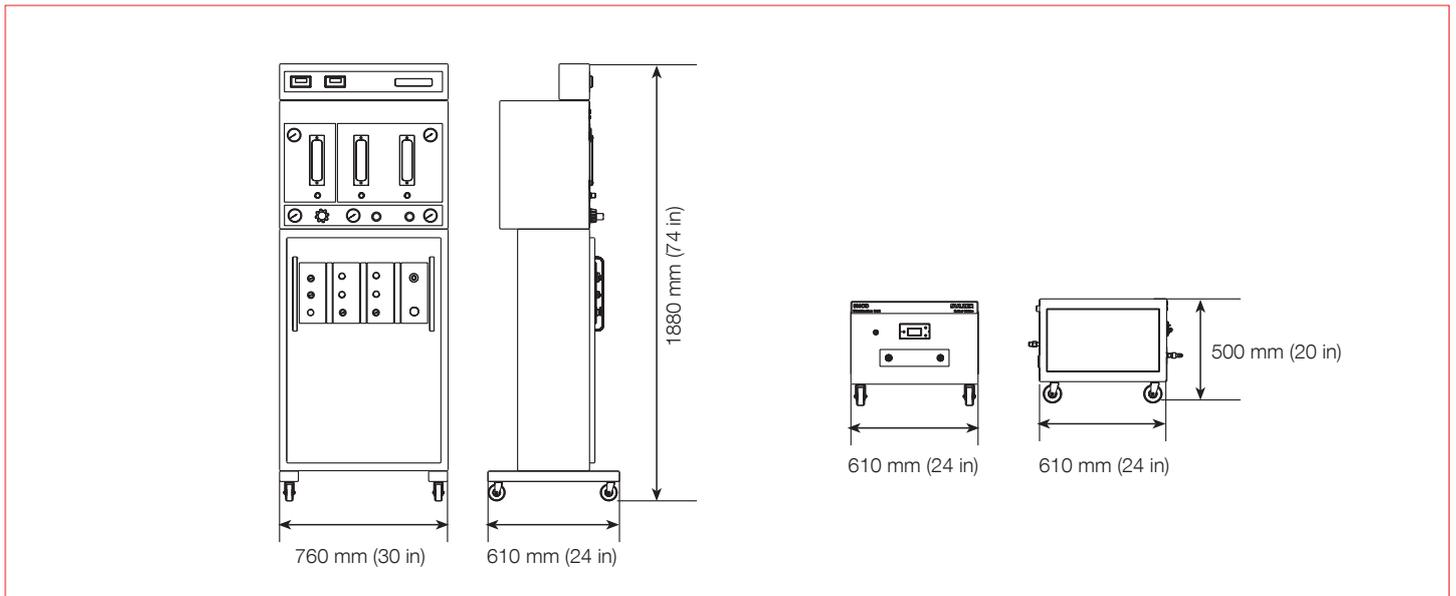
9MC900 Remote Control Pendant provides start/stop control for spray operation up to 7.6 meters (25 feet) away from the 9MC controller.

9MC420 Transformer is used to connect the Metco 9MC controller to 200, 220 or 240 VAC, single phase, 50/60 Hz power sources.

9MCD604 Electrode Fitting Adapter for use of a Metco 3MB spray gun with the supplied 9MCD600 Voltage Divider.

4 Technical Data

4.1 Dimensions



4.1 Specifications

Process gases		
	Argon, Nitrogen, Helium and Hydrogen	
Gas requirements		
Hydrogen		
Flow	13 NLPM at 5.17 bar	30 SCFH at 75 psi
Purity	99.995%, "pre-purified" grade	
Argon		
Flow	98 NLPM at 6.9 bar	224 SCFH at 100 psi
Purity	99.995%, "pre-purified" grade	
Nitrogen		
Flow	91 NLPM at 5.17 bar	207 SCFH at 75 psi
Purity	99.7%, "pre-purified" grade	
Helium		
Flow	88 NLPM at 5.17 bar	200 SCFH at 75 psi
Purity	99.995%, "pre-purified" grade	
Air requirements		
Flow	920 NLPM at 5.9 bar	2100 SCFH at 85 psi
Quality	clean, dry and oil-free	
Weight		
Metco 9MC Controller	208 kg	460 lb
Metco 9MCD Distribution Unit	161 kg	355 lb
Compatibility		
Guns	Metco 3MB, 9MB, 11MB, F4	
Powder Feeder	9MP, 5MPE (requires 5MPA Interface Assembly), Twin 10-C	
Electric power requirements		
Voltage	110 /120 V, single phase, 50/60 Hz	
	110 / 220 / 240 V, single phase, 50/60 Hz with 9MC420 Transformer	
Amperage	9.2 A @ 110 / 120 VAC	
	4.6 A @ 200 / 240 VAC	
Plasma Power Control Capability	80 kW	

Information is subject to change without prior notice.