

Product Data Sheet

Metco 9MP Series Thermal Spray Powder Feeders

The Metco™ 9MP series of closed-loop powder feeders are widely acclaimed for ease of use, accuracy and repeatability in many thermal spray applications.

1 Introduction

Gravimetric in design, the 9MP series feeders have computerized, closed-loop feed rate monitoring and control for superior powder feed precision. The very fast time from feed start to feed rate setpoint saves material costs and reduces the amount of setup time for spray operations. User-programmable feed rate limits ensure consistent feed rates that are appropriate for specific applications.

Whether the feed powder is relatively fine or coarse, low density or high density, the 9MP series feeders provide excellent performance for a wide range of powder morphologies, including spherical materials, acicular materials and blocky materials.

The Metco 9MP series feeders can be used for air plasma spray or combustion powder spray (Thermospray™) processes. High pressure models are available that have been designed for the HVOF spray process and employ additional safety features. Models that integrate with the Metco UniCoat™ and MultiCoat™ thermal spray platforms are available, which can be completely controlled and programmed from the system operator console.





9MP-DJ



9MPE-DJ



9MPE-DJ-CL20

1.1 Description

Oerlikon Metco offers seven standard 9MP powder feeder models, each designed for a specific production environment:

Included Features		9MP	9MPE ^a	9MP-CL20	9MPE-CL20 ^a	9MP-DJ	9MPE-DJ ^a	9MPE-DJ-CL20 ^a
Process compatibility	Air plasma / combustion powder spray	●	●	●	●			
	HVOF spray ^b					●	●	●
Operating characteristics	Closed-loop powder feed	●	●	●	●	●	●	●
	Gas metering: mass-flow			●	●			●
	Gas metering: rotameter	●	●			●	●	
	Remote control capability	● ^c	● ^c	●	●	● ^c	● ^c	●
	Closed loop air vibrator pressure			●	●			●
	Programmable parameters and limits	●	●	●	●	●	●	●
	CE-conformant		●		●		●	●
	MultiCoat Plasma			●	●			
Controller compatibility	UniCoatPro Plasma	● ^c	● ^c					
	UniCoatPro LF						● ^c	● ^c
	UniCoat-GF, -LF, -GLF							●
	9MC, 6C, 6CE, manual plasma / combustion powder systems	●	●					
	DJC, manual HVOF systems					●	●	
Spray gun compatibility	All Oerlikon Metco air plasma spray guns / 6P-II series guns	●	●	●	●			
	All Oerlikon Metco gas fuel and liquid fuel HVOF guns					●	●	●

^a Choose when CE-conformance is required.

^b Customers who require a single feeder for both HVOF spray and another thermal spray process can use an HVOF-compatible feeder.

^c Powder feeder start/stop only – all other functions are set at the feeder.

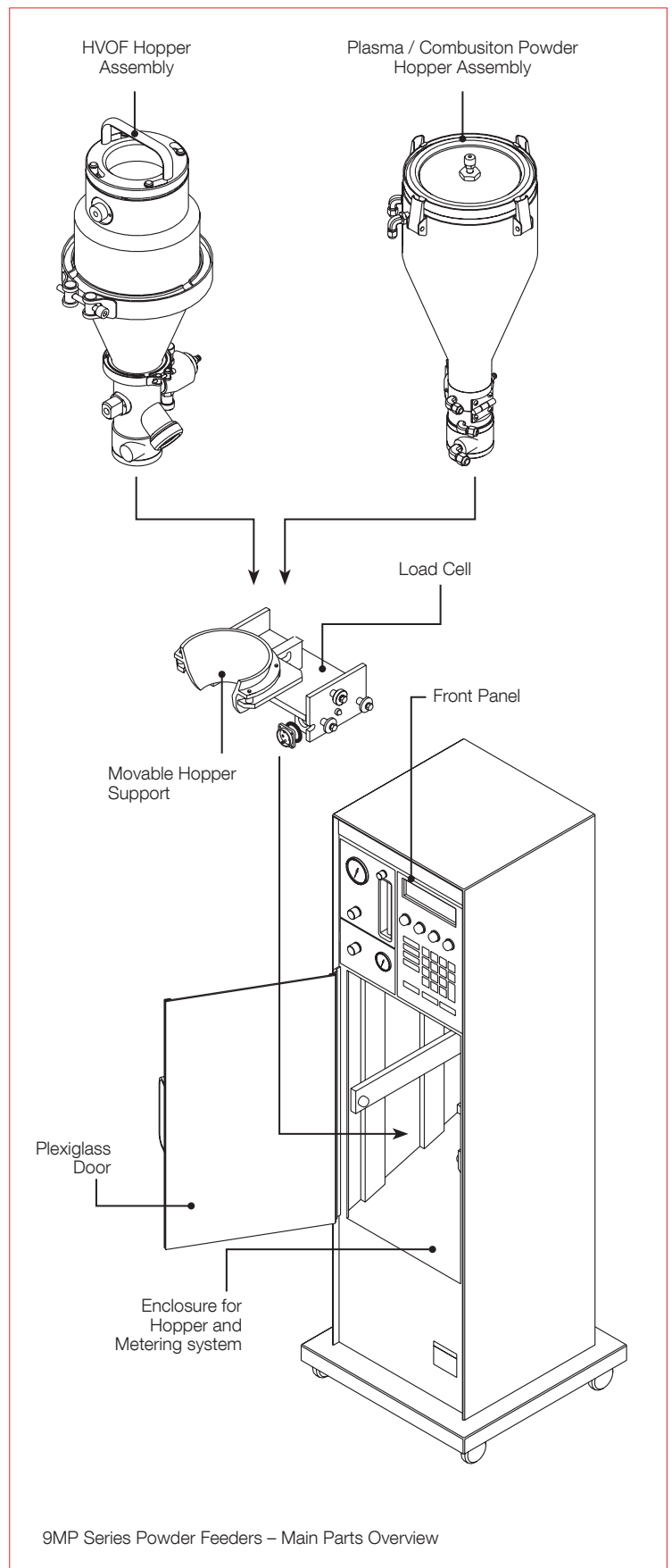
The 9MP series feeders use gravity, fluidization, pressure differential and carrier gas to deliver the material to the spray gun. Spray powder materials are gravity fed from the tapered hopper to a gas fluidization area at the base of the hopper, where a vibrator assists in gravity feed and fluidization. Carrier gas enters the hopper base and passes through the fluidization area to a pickup shaft, moving the powder out of the hopper and towards the spray gun. Increased pressure differential increases the powder feed rate.

Feed rate control is achieved by a highly accurate, microprocessor controlled, weight-loss device that uses a load cell to continuously weigh the contents of the hopper, with feed rate determined by the rate of hopper weight-loss averaged over time. 9MP series feeders are capable of adjusting for variation, so the rate of powder feed is very consistent during an entire spray run. If the 9MP cannot adequately compensate, an alarm condition will occur. An alarm will also occur before the hopper is empty. The metering system is enclosed and dampened to shield it from air turbulence and external vibration.

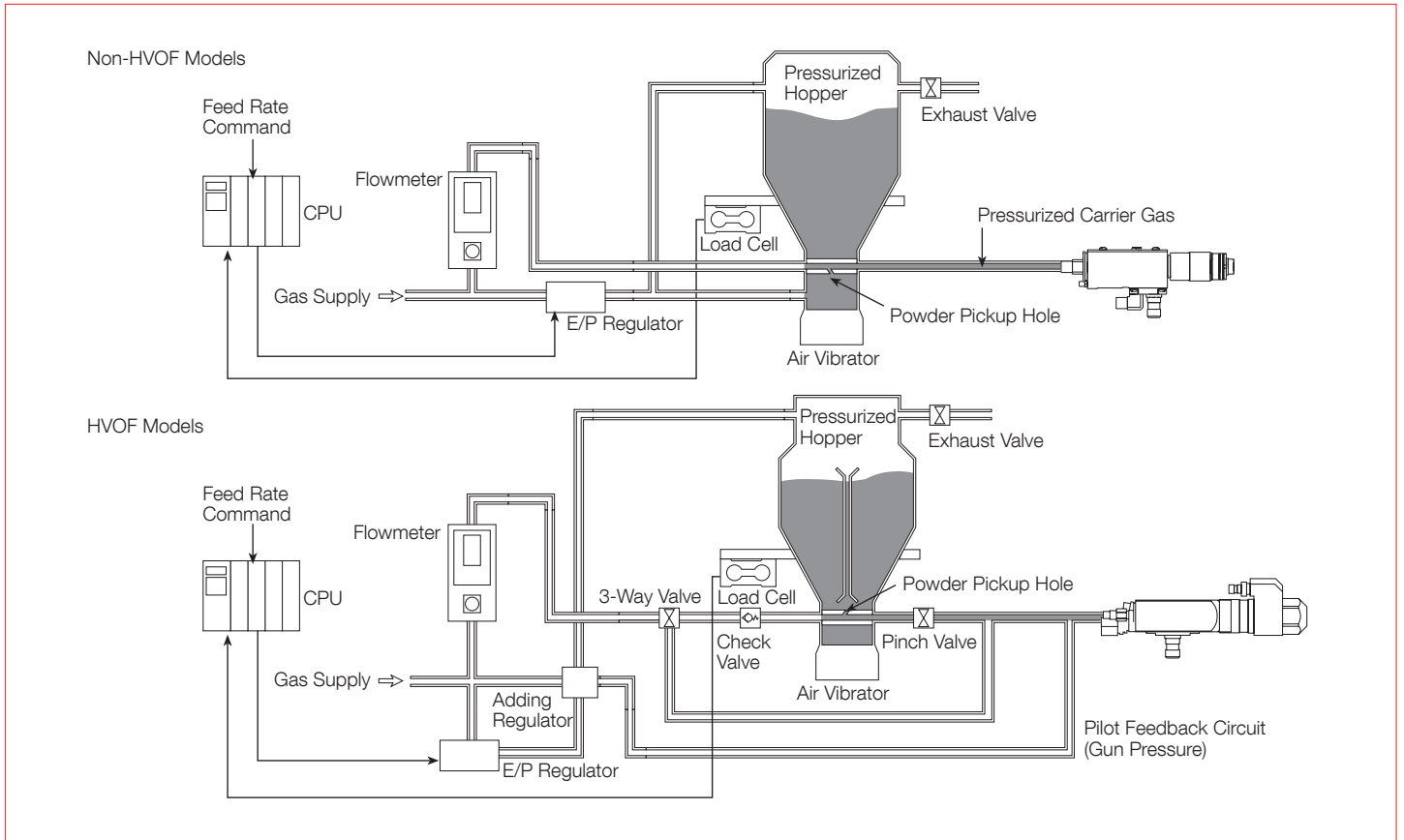
Operators can either enter a known hopper pressure or a desired feed rate into the 9MP feeder. If the necessary hopper pressure to achieve the desired feed rate is known and entered, the 9MP will immediately ramp to this value. If the hopper pressure is not known and a feed rate is entered, the 9MP will determine the necessary hopper pressure to maintain the feed rate.

Operators can also use the 9MP "Auto Setup" mode. In this mode, the feeder quickly determines the correct hopper pressure for the feed rate entered using as little powder as possible.

Cleanout and powder changeover for 9MP feeders is fast and simple. Because these feeders have almost no moving parts, they are very easy to maintain.



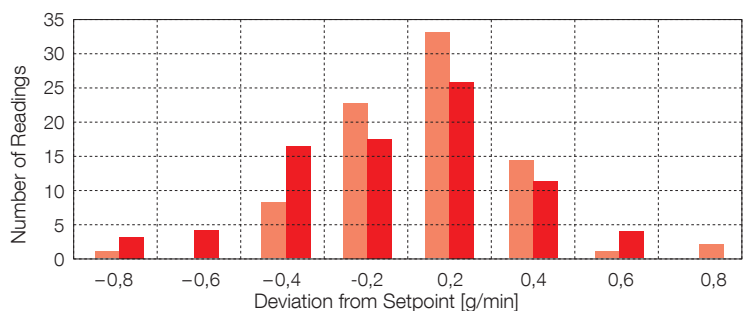
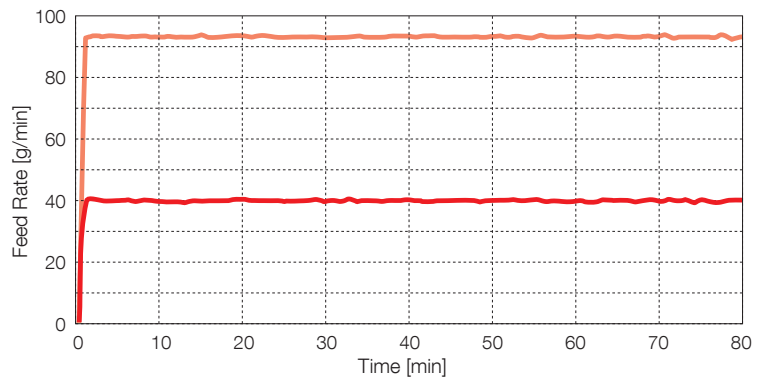
1.2 Operating Principles



1.3 Feed Rate Monitoring and Control

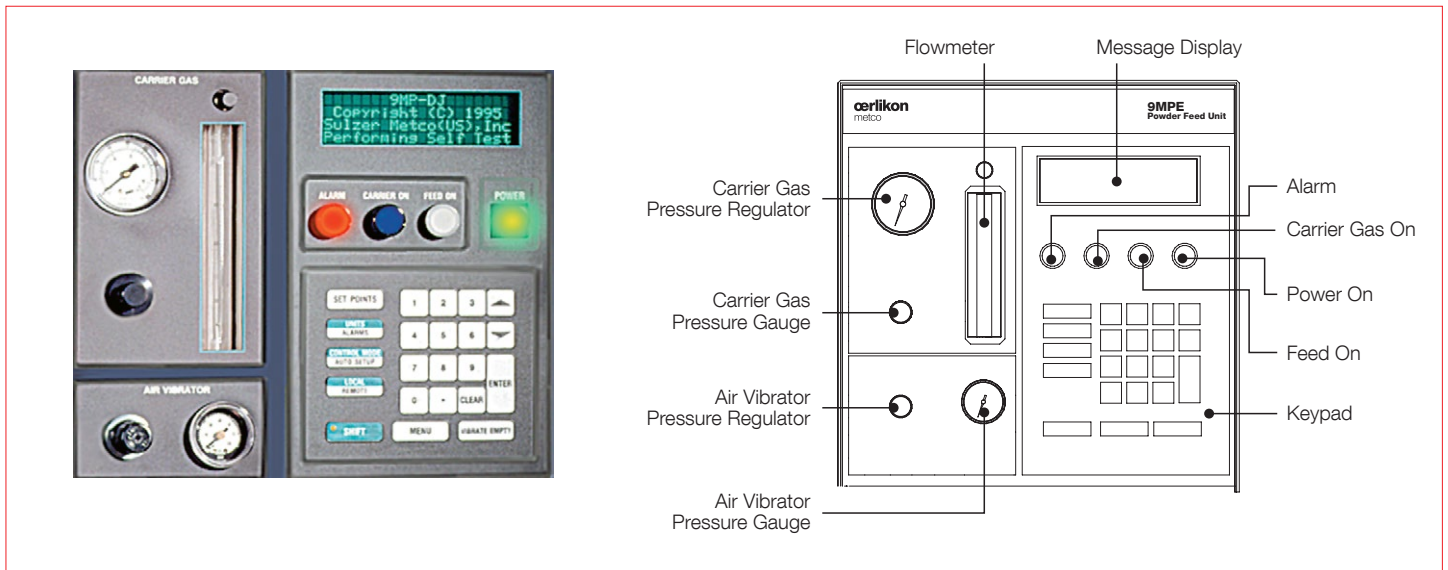
Metco's 9MP series feeders accurately monitor and maintain powder feed rate throughout the entire spray campaign. Data shown is from actual feed rate runs of Metco 72F-NS and Metco 105SFP.

The customer's actual feed rate data may vary depending on powder used, maintenance of powder feeder and other spray conditions.



<ul style="list-style-type: none"> ■ Metco 72F-NS sintered and crushed ■ Metco 105SFP angular and blocky 	<p>WC 12Co -45 +11 μm</p> <p>99.5+ Al₂O₃ -31 +3.9 μm</p>
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1.4 Operating Panel (9MPE-DJ)



2 Features and Benefits

Effective:

- Capable of feeding a full array of thermal spray powders over a wide range of feed rates, regardless of particle size and morphology.
- Feed rate monitoring and control using a high precision load cell for reliable, accurate powder delivery within ± 1 g/min for non-HVOF models and ± 1.5 g/min for HVOF models.
- Data output allows printout of parameters or actual feed data to a printer or text file.
- Uses time-proven, gravimetric and fluidic bed feed methodology.
- On-board vibrator assists in the feed of fine powders.
- High precision, quality gauges and meters throughout for very accurate feed rates.
- Can be remotely operated from a gun or control console (features vary with model chosen).
- O-ring seals used throughout eliminates leaks and maintains feed rate performance.

Environmental:

- CE-conformant models available.
- HVOF Models:
 - High pressure hopper assembly of 6.9 bar (100 psi), remains under constant pressure for safety.
 - Hopper exhaust vent protects against hopper over-pressure conditions.
 - Three-way solenoid and pinch valve react instantly to any high back pressure condition from the HVOF gun and prevent combustible gases from reaching the hopper under any conditions.

Economical:

- Built-in "Auto Setup" mode, saves powder while determining ideal hopper pressure and eliminates time-consuming manual feed rate checks and reduces powder waste.

Efficient:

- Feed rate control via entry of a known hopper pressure or actual desired feed rate.
- Built-in computer control compensates for normal fluctuations in conditions, such as pickup shaft wear, changes in carrier gas flow and changes in powder level to maintain an accurate feed rate.
- Non-volatile memory retains last parameter set on shut down (Note: On CL20 models, the parameters are stored at the controller rather than the feeder).
- Reaches set point in as little as 30 seconds for efficient production.
- Keypad entry and a large, easy to read message center that displays in metric and English units for simple set up and operation.
- Internal leak check capability and messaging with programmable set points and low powder alarm reduces chance of error. (Note: internal leak check not available on HVOF models).
- Large, 5.7 liter hopper (3.2 liter on HVOF models) for long spray campaigns.
- Virtually no moving parts simplifies maintenance.
- HVOF Models: Carrier gas pressure is directly regulated between the HVOF gun and carrier gas supply ensuring gas pressure is higher at the feeder for proper flow.

3 Options and Accessories

Oerlikon Metco offers a variety of options that allow configuration of the 9MP series powder feeders for use in a wide number of coating applications and to suit specific production requirements. These include hoses, cables, pick up shaft assemblies and optional hopper assemblies. Customers should choose the correct parts for their specific coating application and spray requirements.

Interface Box: Functionality includes powder feed on/off, carrier gas on/off and an E-Stop. Interface Boxes can also be used to connect the 9MP series powder feeder to customer-supplied gas flow and pressure calibrators. Two models are available:

- PKG58423 for CE-conformant 9MP feeder models 9MPE, 9MPE-CL20, 9MPE-DJ, 9MPE-DJ-CL20.
- PKG54915 for non-CE-conformant 9MP feeder models 9MP and 9MP-DJ.

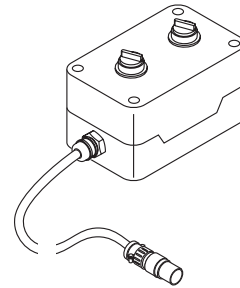
Gun Handles: Provides remote powder feed on/off for systems using a hand-held 6P-II Thermospray gun or a hand-held Diamond Jet™ HVOF spray gun. Two models are available:

- MPHE for use with CE-conformant 9MPE and 9MPE-DJ model powder feeders and CE-conformant hand-held guns. Includes a 7.6 meter (25 foot) electrical cable.
- DJ125 for use with 9MP and 9MP-DJ powder feeders and guns. Includes a 4.6 meter (15 foot) electrical cable. Not CE-conformant.

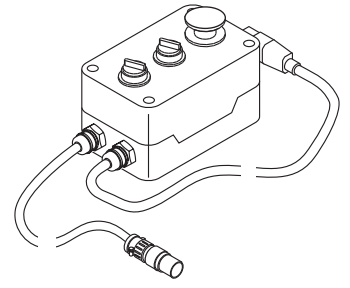
Note: Some hand-held HVOF guns come equipped to interface directly to, and provide remote start/stop functionality, for a 9MP HVOF model feeder.

9MC420 Transformer Assembly: Permits a non-CE-conformant 9MP or 9MP-DJ model powder feeder to operate using 200/220/240 VAC, single phase, 50 to 60 Hz power.

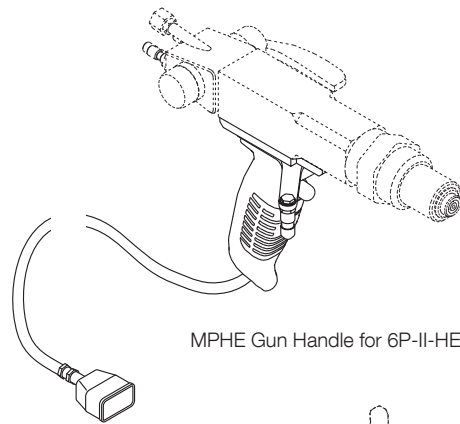
For a complete list of optional parts and spare parts, please refer to the parts lists section of the reference manual.



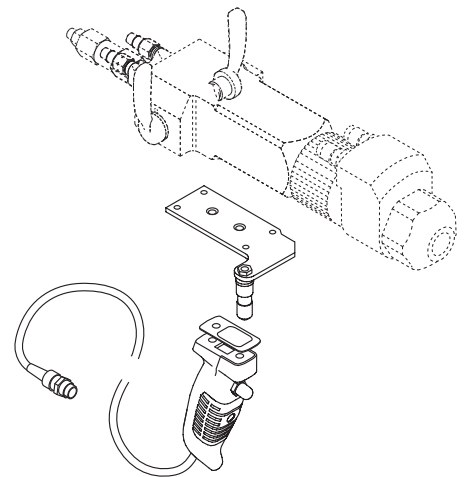
PKG58423 Interface Box



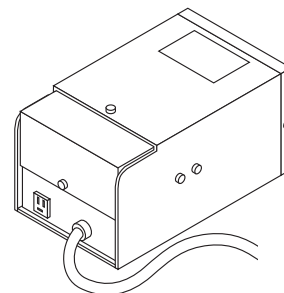
PKG54915 Interface Box



MPHE Gun Handle for 6P-II-HE Gun



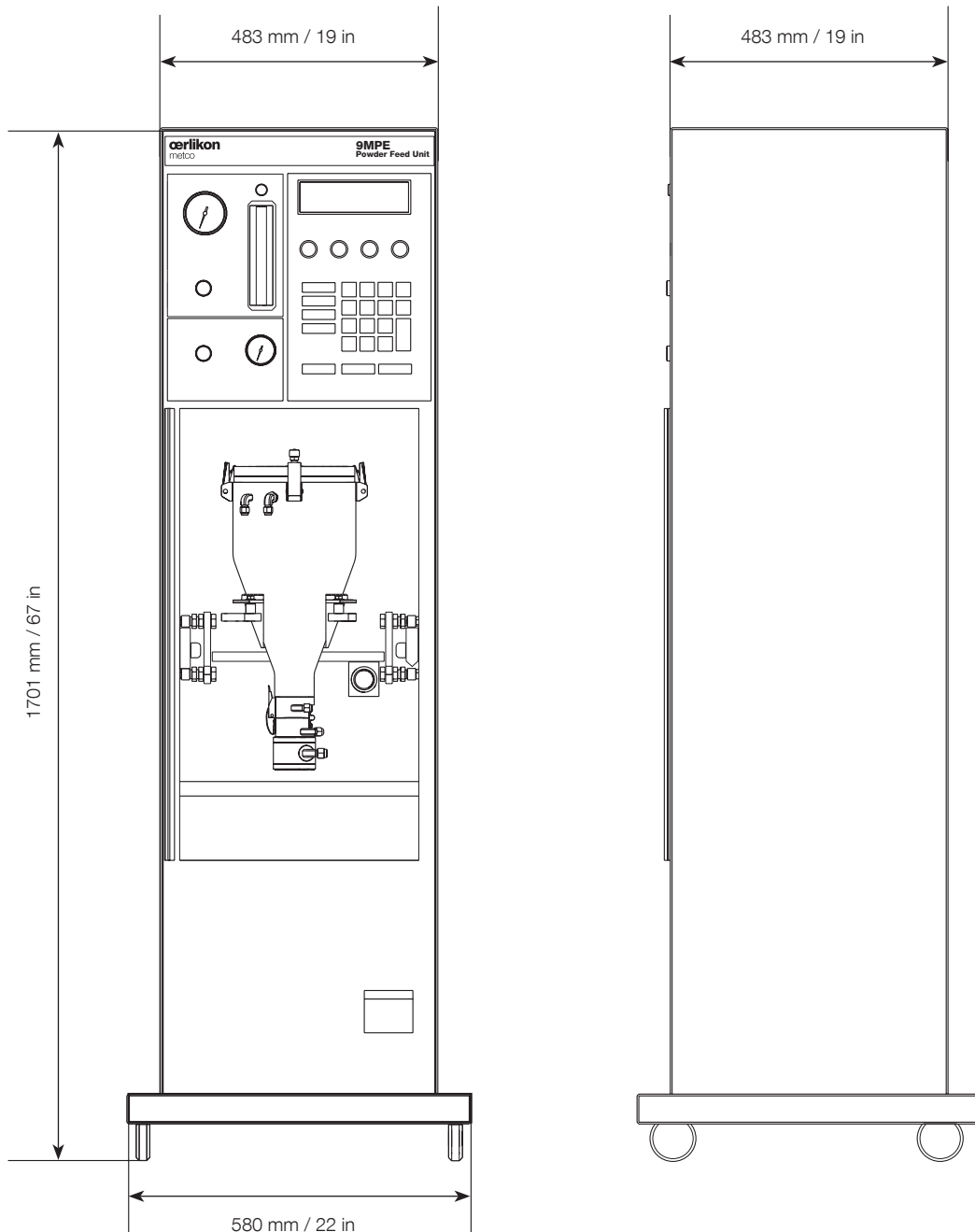
DJ125 Gun Handle for Diamond Jet Guns



9MC420 Transformer Assembly

4 Technical Data

4.1 Dimensions



4.2 Specifications

General Specifications (with hopper)

Weight	Approximate	250 kg	550 lb
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Power

Voltage	CE models	120 to 220 VAC (internal transformer)	
	Non-CE models	120 VAC	
Frequency		50 to 60	
Power Consumption		0.18 kVA	

Operating Environment

Temperature		10 to 40 °C	50 to 105 °F
Relative Humidity		75% non-condensing	

Material Requirements

Feed Rate	Range	5 to 300 g/min	0.66 to 40 lb/h
Particle Size	Range	2 to 200 µm	

Carrier Gas Requirements

Nitrogen (N ₂)	Pressure	Non-HVOF models	2.7 to 8.27 bar	40 to 120 psig
		HVOF models	12 bar	175 psig
	Flow	Non-HVOF models	1.1 to 11 NLPM	2.5 to 25 SCFH
		HVOF models	4.5 to 20 NLPM	10 to 46 SCFH
	Purity (min)	99.95 % (European Standard: 99.996 %)		
Argon (Ar)	Pressure	Non-HVOF models	4.1 to 8.27 bar	60 to 120 psig
		HVOF models	12 bar	175 psig
	Flow	Non-HVOF models	1.1 to 11 NLPM	32.5 to 25 SCFH
		HVOF models	4.5 to 20 NLPM	10 to 46 SCFH
	Purity (min)	99.95 % (European Standard: 99.996 %)		

Vibrator Air Requirements

Air	Pressure	5.17 bar	75 psi
	Flow	113 l/min	4 ft ³ /min
	Quality	clean, dry and oil-free	

Precision

Feed Rate	Non-HVOF models	± 1.0 g/min
	HVOF models	± 1.5 g/min

Data Outputs

Interfaces	(PC compatible)	RS-232
		Parallel Port