oerlikon
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Product Data Sheet
Single Pro Powder Feeder

Oerlikon Metco's Single Pro is our disk version, volumetric powder feeder with precise feeding accuracy that can be used for all atmospheric thermal spray processes using powder as the feedstock.

Consistent powder feed rate contributes directly to consistent coating quality and thickness. The Oerlikon Metco Single Pro incorporates our proven disk feeding technology, combined with highly accurate digital mass flow meters, to deliver accurate feed rates.

Oerlikon Metco's Single Pro powder feeders are designed for use with our advanced thermal spray platforms:

Platform	Operator Control Via	Feeders per system (max)	Enclosure Style
MultiCoat Pro	Clarity User Interface	8	Cabinet
Surface One		4	Frame

The operator has complete accessibility and control of all feed parameters through the Clarity user interface, which communicates directly with the Single Pro. Multiple Single Pro powder feeders can be operated independently or simultaneously.

There is no need to change the powder feeder for different thermal spray processes as all Single Pro feeders can be used for:

- Atmospheric Plasma Spray
- HVOF Liquid Fuel
- HVOF Gas Fuel
- Combustion Powder Spray

Hoppers designed for the Single Pro feeder employ a unique RFID system that recognizes the type of hopper, thus ensuring the correct hopper for the thermal spray process.

The Single Pro powder feeder is equipped with a new, high-torque stirrer motor that improves the stirrer function for densely-packed and/or high-density powders.

Single Pro feeders use standard Oerlikon Metco powder feeder components, including suction/spreader bars, stirrers and disks. The wide range of options available allow customers to configure their feeder for their specific spray application.

Single Pro Powder Feeder
(Frame Version)

Single Pro Powder Feeder
(Cabinet Version)

1 Principle of Operation

The powder feed system is based on a rotating powder disk with an annular groove. The disk speed controls the powder feed rate, adjusted such that the powder fills the disk. A spreader bar ensures the powder does not over fill the groove. A suction bar ensures the powder is efficiently and completely exhausted into the powder feed line for conveyance by the carrier gas to the point of process injection. The powder feed rate is proportional to the rotational speed of the powder disk and can be infinitely varied to any desired value within the feed range. A PID controller is used to accurately control the disk speed. A stirrer in the powder hopper can be optionally used to maintain powder flow into the disk. To discharge any potential static that may build up in the feeder, the hopper is grounded.

All parameters to operate the Single Pro feeder are accessible via the Clarity user interface and can be stored as part of the spray recipe at the controller:

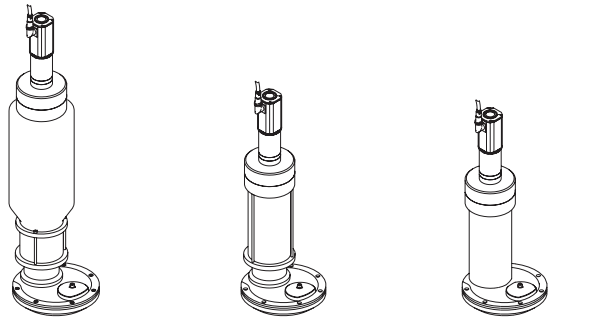
- Switching the metering disk on or off
- Setting the rotational speed of the metering disk
- Switching the stirrer on or off
- Setting the rotational speed of the stirrer
- Preselecting the carrier gas (argon or nitrogen)
- Switching the carrier gas on or off
- Setting the carrier gas flow
- With heater option: switching the heater on or off and setting the temperature

In addition, the spray controller monitors the feedback communications received from the powder feeder via the PLC:

- Metering disc rotational speed
- Stirrer rotational speed
- Carrier gas flow
- Hopper pressure
- Heater temperature (with heater option)

1.1 Hoppers

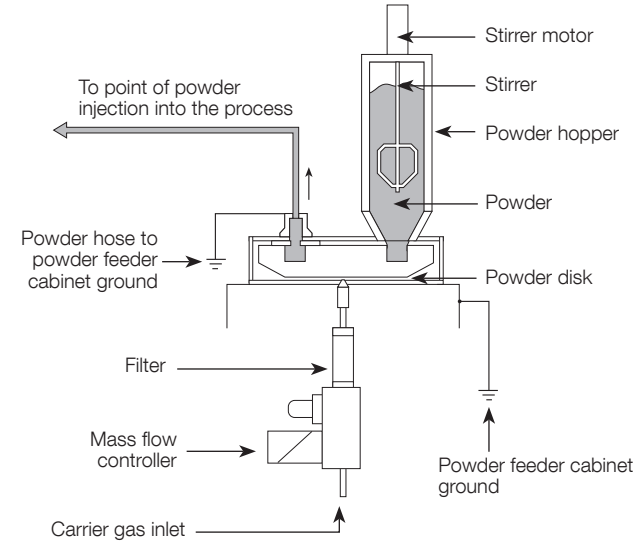
The Single Pro requires specialized hoppers that have the RFID functionality. Hoppers are not included with the feeder so that customers can choose the hoppers best suited for their needs.



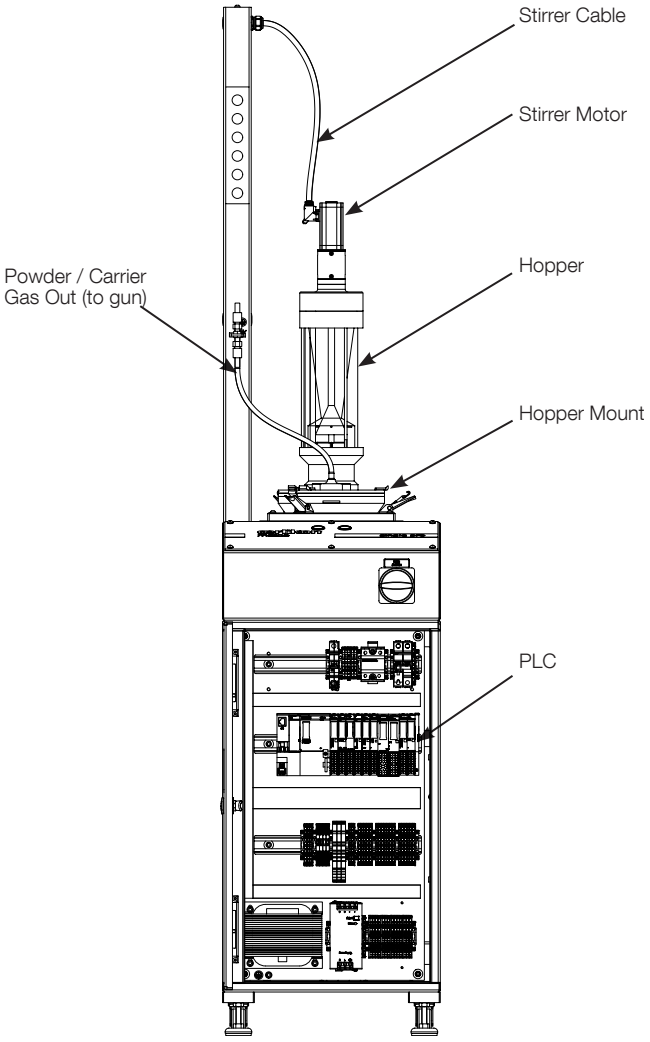
5 L Aluminum Hopper APS or HVOF-LF

1.5 L Acrylic Hopper

1.1 L Aluminum Hopper



Single Pro Principle of Operation



Single Pro: Main Components (cabinet version shown)

1.2 Available Single Pro Models

Customers can choose from the factory-configured Single Pro feeder models shown in the table below. Gas flow module and heater option can be field retrofitted at a later date, if necessary, however factory-configuration is recommended.

Model	Enclosure Style [a]	Gas Flow Module [b]	Heater [c]
Single Pro C	Cabinet	Standard	None
Single Pro C-HT	Cabinet	Standard	230 volt version
Single Pro C-HT-115	Cabinet	Standard	115 volt version
Single Pro C-MHF	Cabinet	High	None
Single Pro C-MHF-HT	Cabinet	High	230 volt version
Single Pro C-MHF-HT-115	Cabinet	High	115 volt version
Single Pro F	Frame	Standard	None
Single Pro F-HT	Frame	Standard	Standard
Single Pro F-MHF	Frame	High	None
Single Pro F-MHF-HT	Frame	High	Standard

[a] **Cabinet:** standalone version appropriate for MultiCoat Pro systems; **Frame-Mount:** framework version appropriate for Surface One systems
[b] **Standard:** carrier gas flows up to 20 NLPM (45 SCFH) for APS or HVOF; **High:** carrier gas flows up to 50 NLPM (114 SCFH) for high feed rate HVOF applications.
[c] Choose the voltage appropriate for your electrical requirements and is the voltage necessary to operate the heater option only. Heater option does not include heater jackets or hoppers, which must be ordered separately. For frame-mount version it is not necessary to specify a heater voltage as this is supplied from the system.

2 Features and Benefits

- Excellent powder feed accuracy and repeatability based proven rotating disk technology
- Accuracy is maintained throughout the spray run, even for extended spray campaigns,
- Feed rate is independent of the height of the powder in the hopper
- Feed rate is independent of the temperature
- Two-way communication with the controller maintains the powder feed recipe settings
- Digital mass flow controlled carrier gas for stable gas flow across a wide range of operating parameters
- All powder feeder functions are controlled, set and monitored at the platform user interface, simplifying operation and spray parameter setup
- Feeds all types thermal spray powders, from very coarse through very fine particle sizes (5 µm to 200 µm)
- Highly configurable to the spray application requirements using the wide range of available optional components
- Simple, robust construction requires little maintenance and provides years of trouble-free service
- Designed for very safe operation, including HVOF
- RFID hopper recognition ensures correct hopper is used for the spray process
- Writable RFID can be used to identify hoppers dedicated to specific feedstock materials
- Improved high-torque stirrer motor
- Industry 4.0 ready with connection via OPC UA interface

3 Accessories and Options

Oerlikon Metco offers a a wide variety of accessories and options for Single Pro powder feeder to suit specific spray requirements. These include:

- Metering disks of different groove sizes and substrate materials
- Suction and spreader bars of different widths, heights and angles
- Stirrer configurations

For a complete list of optional parts and spare parts please refer to the parts list for the Single Pro.

Heater Option

The heater option is recommended when using hygroscopic powders to prevent the powder from absorbing moisture. When the heater option is installed, the heaters are controlled through the system user interface. Single Pro feeders can be purchased with the heater option factory installed or field-retrofitted at a later date.

The heater option provides the software and hardware interface to control the heater temperature and turn the heater on and off.

Neither hoppers nor heater jackets are included with the heater option and must be ordered separately. Heater jackets can only be used with aluminum hoppers and must be chosen for the size of the hopper (1.1 or 5.0 liter).

The heater option is available in two voltages. Customers should choose the voltage option appropriate for their electrical requirements. Voltage designated is for operation of the heater jackets, not the Single Pro Feeder:

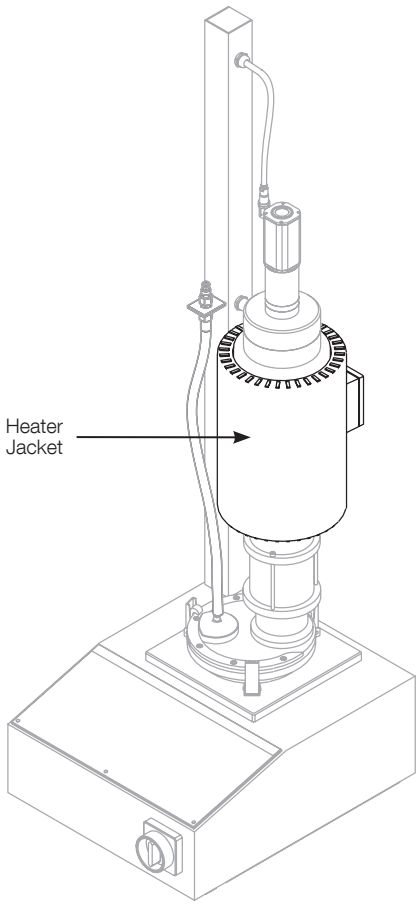
- 230 V
- 115V

Powder Hoppers

The Single Pro does not come with powder hoppers and customers must choose a hopper for their Single Pro feeder. Please see Section 1.1 for available hoppers. Additional hoppers, of any type, can be added at any time. Hoppers also make ideal powder storage containers and additional hoppers can be ordered and use by customers who switch powders frequently but would like to have commonly used materials ready to go using a dedicated hopper for that material.

High Flow Rate Carrier Gas Option

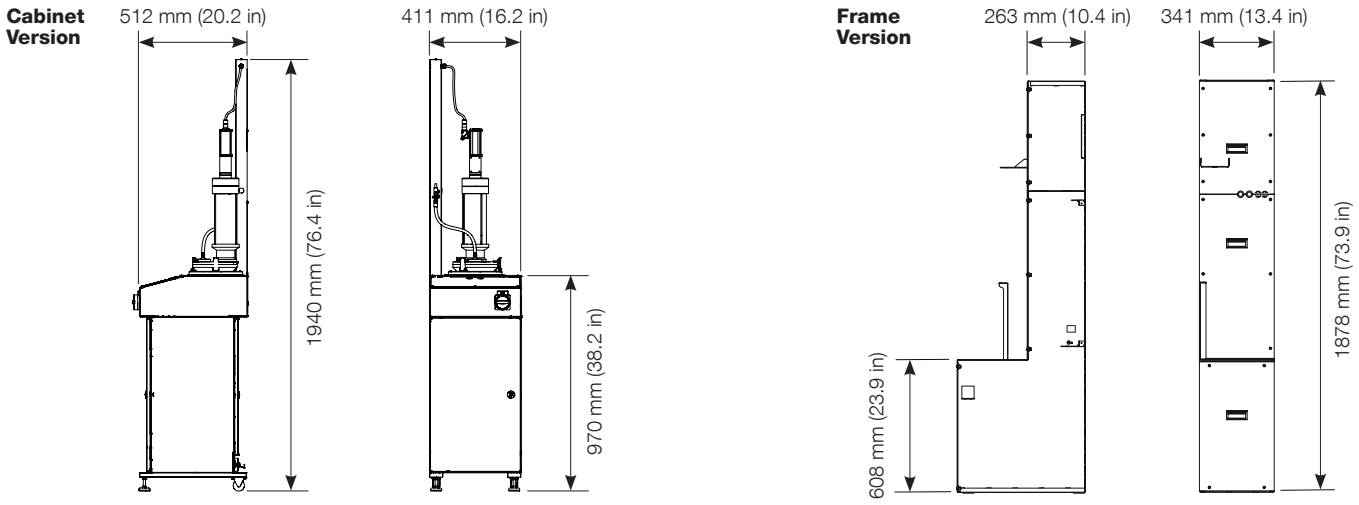
The high flow rate option increases the maximum carrier gas flow from the standard 20 NLPM (45 SCFH) to 50 NLPM (114 SCFH) for very high spray rates through the installation of a second mass flow controller (MFC). The software automatically switches to the MFC with the best accuracy with no intervention by the operator. Single Pro feeders can be purchased with the high flow rate carrier gas option factory installed or field-retrofitted at a later date.



Heater Option

4 Technical Data

4.1 Dimensions (cabinet version)



4.2 Specifications

Power Requirements			
Voltage	without heaters	100 to 120 / 200 to 240 VAC (± 2 %)	
	with heaters	100 to 120 VAC (with Heating 115), 200 to 240 VAC (with Heating 230)	
Frequency		50/60 Hz	
Power Consumption	without heaters	0.3 kW	
	with heaters	0.8 kW	
Fusing		16 A (per CE)	20 A (per UL)
Carrier Gas			
Type		argon or nitrogen	
Connection		3/8 in Swagelok	
Supply Pressure	minimum	APS: 5 bar; HVOF: 10 bar	APS: 72.5 psi; HVOF: 145 psi
	maximum	12 bar	174 psi
Output flow (max)	APS / HVOF (argon or nitrogen)	20 NLPM ± 2 % full scale	45 SCFH ± 2 % full scale
	HVOF - High Flow (nitrogen)	50 NLPM ± 2 % full scale	114 SCFH ± 2 % full scale
Powder Feeding [a]			
Feed Rate		5 to 150 g/min	0.7 to 19.8 lb/h
Feed Rate Deviation (max)		± 2 g/min	± 0.26 lb/h
Metering Disk	power output	65 W at 4A	
	accuracy	± 0.08 %	
	time to reach nominal speed	≤ 6 s	
	speed control range	0.25 to 10 rpm (corresponds to 2.5 to 100 % of disk speed)	
Weight			
Without Hoppers		78 kg	168 lb
Operating Environment			
Temperature		+10 to +40 °C	+50 to +104 °F
Humidity		< 75%, non-condensing	
Housing Protection Class		IP 54	IEC 60529
Compatibility			
System Platform		MultiCoat Pro, Surface One	
Spray Gun [b]		All Oerlikon Metco Spray Guns except 5P-II and ChamPro spray guns	

[a] With correct hopper, feeder hardware and parameters
[b] Thermal spray guns using powder as the feedstock material

Information is subject to change without prior notice.

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