

Product Data Sheet Metco PTPro Series Plasma Power Supplies

Fully automated, inverter-type power supply for plasma spray systems.

The Metco™ PTPro series power supplies employ advanced technology that ensures outstanding process stability and coating reproducibility for plasma spray systems.

Compared to thyristor-type power supplies, the Metco PTPro power supplies have lower EMI (Electro-Magnetic Interference) emissions, lower output noise levels and significantly reduced current ripple for the output waveform. Of economic importance is that Metco PTPro power supplies have very high electrical efficiency of greater than 90 %, thereby substantially reducing energy costs.

Because Metco PTPro series power supplies have fast, precise control features, they generate a nearly ideal high frequency DC waveform. This results in a more uniform and stable plasma plume with improved feedstock melting behavior and extends the service life of the spray gun anode and cathode.

Metco PTPro series power supplies provide flexible power options for practically any plasma spray system. Models are available that can be used to power

- Both single cathode and triple cathode spray guns using a single Metco PTPro power supply
- Standard and very high power spray guns
- Low power spray guns, such as small guns to spray internal geometries
- Atmospheric plasma and ChamPro™ (LVPS, LPPS, VPS) spray systems
- Unusually hot operating environments

Metco PTPro power supplies protect your existing investment should a replacement be needed for an existing plasma spray system. The Metco PTPro 120 can directly replace TriStar IPS and Metco PT3X power supplies. When replacing a Metco 10MR or a PT-1xx0 series unit, the Metco PTPro can emulate the waveforms of those power supplies. Thus no adjustment of spray parameters are required saving on parameter redevelopment time and cost.

The Metco PTPro is available in two different configurations:

- Floorspace-saving high-profile design
- Low-profile design appropriate for installation on mezzanines



Metco PTPro 120
Plasma Power Supply
(high-profile, air-cooled)

1 General Description

Several models of the Metco PTPro power supply are available:

Model	Features	Spray Guns	Temperature of Operating Environment
Metco PTPro 120	Air cooled; high profile	Medium to high power; single / triple cathode	5 to 40 °C (41 to 104 °F)
	Water cooled; high profile		5 to 55 °C (41 to 131 °F)
	Air cooled; low profile		5 to 40 °C (41 to 104 °F)
Metco PTPro 45	Air cooled; high profile	Low power; single cathode	5 to 40 °C (41 to 104 °F)
	Water cooled; high profile		5 to 55 °C (41 to 131 °F)

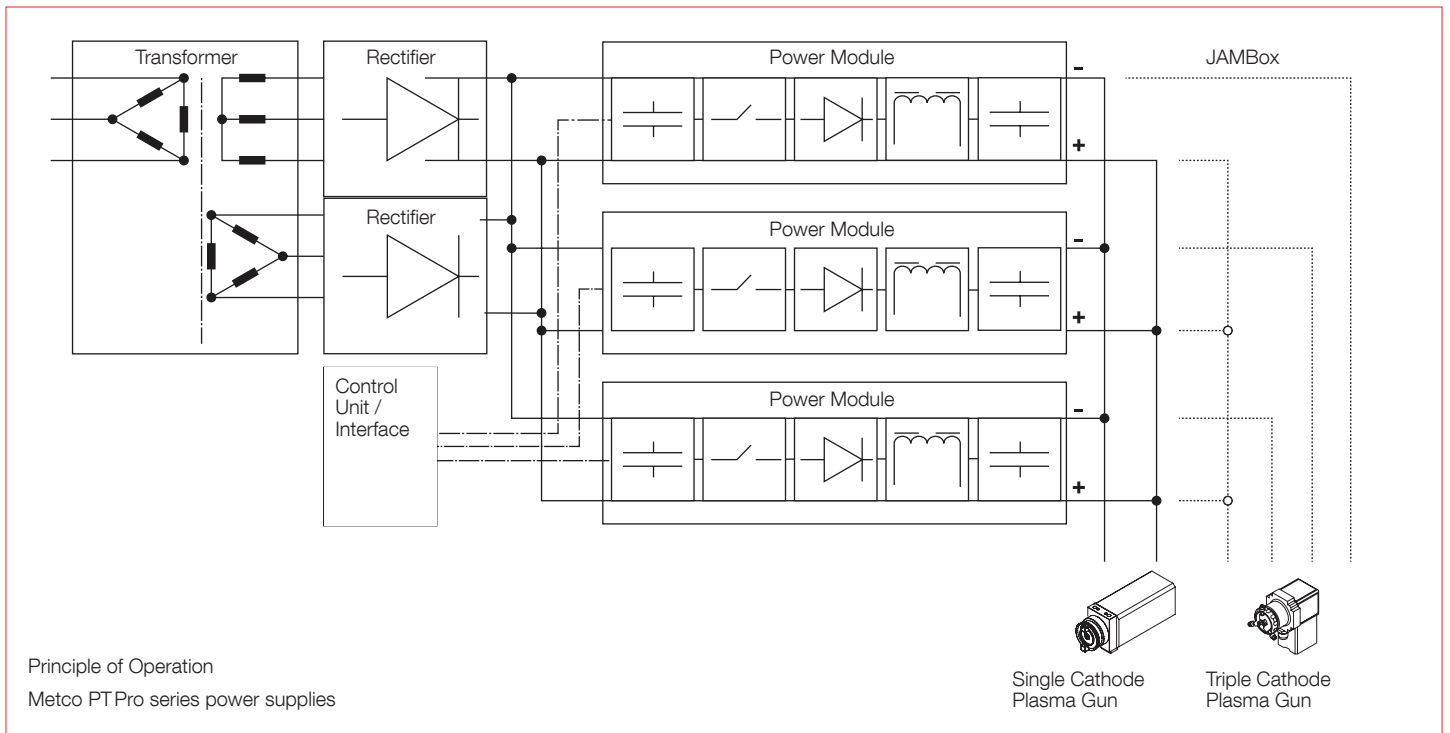
Based on pulsed-power and IGBT (Insulated Gate Bipolar Transistor) technologies, the Metco PTPro power supplies provide faster and more precise control that is unmatched

by previous plasma power supplies with constant-current characteristics.

The Metco PTPro series power supplies are digitally controlled. This ensures that the instantaneous and dynamic plasma process behavior operates within the prescribed process window and in accordance with the specified spray parameters.

Metco PTPro power supplies incorporate a precision time / event management algorithm to control high-frequency ignition. This protects system components from damage resulting from harmful power surges and power overloads.

Metco PTPro 45 and Metco PTPro 120 series power supplies are equally well-suited for systems using single-cathode and TriplexPro™-series triple-cathode spray guns. For ChamPro™ systems, up to three Metco PTPro 120 series power supplies can be connected in parallel to provide up to 3600 A of current.



1.1 Metco PTPro Models

Model	Supply Voltage (V _{ac}) ^a	Power Rating (kW)	100% Duty Cycle Rating	Single-Cathode Spray Guns ^b	Triple-Cathode Spray Guns ^b	Cooling		Profile
						Air ^c	Water ^d	
Metco PTPro 45	200 V _{eff} ± 10%	45	800 A @ 55 V	✓		✓	✓	High Profile
	220 V _{eff} ± 10%			✓		✓	✓	High Profile
	400 V _{eff} ± 10%			✓		✓	✓	High Profile
	460 V _{eff} ± 10%			✓		✓	✓	High Profile
	575 V _{eff} ± 10%			✓		✓	✓	High Profile
Metco PTPro 120	200 V _{eff} ± 10%	120	1200 A @ 90 V 540 A @ 200 V 500 A @ 240 V	✓	✓	✓	✓	High Profile
	220 V _{eff} ± 10%			✓	✓	✓	✓	High Profile
	400 V _{eff} ± 10%			✓	✓	✓	✓	High Profile
	460 V _{eff} ± 10%			✓	✓	✓	✓	High Profile
	480 V _{eff} ± 10%			✓	✓	✓	✓	High Profile
	575 V _{eff} ± 10%			✓	✓	✓	✓	High Profile
	200 V _{eff} ± 10%			✓	✓	✓	✓	Low Profile
	220 V _{eff} ± 10%			✓	✓	✓	✓	Low Profile
	400 V _{eff} ± 10%			✓	✓	✓	✓	Low Profile
	460 V _{eff} ± 10%			✓	✓	✓	✓	Low Profile
480 V _{eff} ± 10%	✓	✓	✓	✓	Low Profile			
575 V _{eff} ± 10%	✓	✓	✓	✓	Low Profile			

^a The current source can be operated in a tolerance window ±10% of nominal voltage. In case local conditions exceed the tolerance band, additional transformer hardware is recommended.

^b Units that can power both single-cathode and triple-cathode spray guns can be configured in a switchable mode with the installation of a SU-T1030 Switching Unit (switching unit is not required for Surface One or MultiCoat Pro)

^c Air-cooled units can be used in environments with cooling inlet temperatures up to 40 °C (104 °F)

^d Water-cooled units can be used in environments with cooling inlet temperatures up to 55 °C (131 °F)

1.2 Multiple Metco PTPro Power Supplies

Multiple Metco PTPro power supplies can be used in the following configurations:

Quantity	Connection Configuration	Usage
2	serial	High power (> 100 kW and > 250 V) atmospheric plasma spray guns
2 or 3	parallel	ChamPro systems (LPPS, LVPS, VPS)

2 Features and Benefits

Effective

- Nearly ideal DC current characteristics with negligible residual ripple for very stable power output
- Metco PTPro 120 units are configurable for conventional single-cathode plasma guns or triple-cathode guns such as Oerlikon Metco's TriplexPro-210
- Multiple Metco PTPro 120 power supply units can be connected in parallel for ChamPro high power requirements of up to 3600 A
- For high power (> 100 kW and 250 V) atmospheric plasma spray guns, two Metco PTPro 120 power supplies can be connected in series.
- Variable supply voltage

Economical

- Power efficiency and a high power factor reduces energy losses and lowers energy costs
- Precision digital process control allows optimization of process start
- Metco PTPro water-cooled models have internal closed-loop water cooling that enhances the reliability and durability of the power supply in very hot environments up to 55 °C (131 °F)
- Can be configured to emulate the Metco 10MR or PT-1xx0 series power supplies should a power supply replacement be needed for an existing system ^a

1.3 Controller Compatibility

Metco PTPro series power supplies can be used with new plasma spray systems or to retrofit existing systems. Please note that all retrofits require evaluation by Oerlikon Metco.

Controller	Compatibility	Software Upgrade Needed for Older Units
Surface One	✓	✗
MultiCoat Pro	✓	✗
UniCoatPro Plasma	✓ ^a	✓
MultiCoat	✓ ^a	✓
UniCoat Plasma	✓ ^{b, c}	✗
Metco 9MC	✓ ^{b, d}	✗

^a Fully compatible when run in Metco PTPro mode; however, not all features are available if run in PT-1xx0 emulation mode

^b Some features are not accessible from the controller; if run in emulation mode, not all Metco PTPro features are available

^c Limited to 1000 A operation

^d Limited to 1000 A operation unless optional interface board is installed by Oerlikon Metco Field Service

Efficient

- Excellent efficiency that is 90 % or greater with power factor of 95 % or greater
- Stable power, even at low amperage, ensures low power extension guns operate reliably and efficiently
- New ignition management system quickly stabilizes the power output to protect gun components
- Variable open-circuit voltage allows the use of nitrogen gas for gun ignition
- Status indication with Metco PTPro Control software, built-in diagnostics and error log allow easier maintenance and troubleshooting

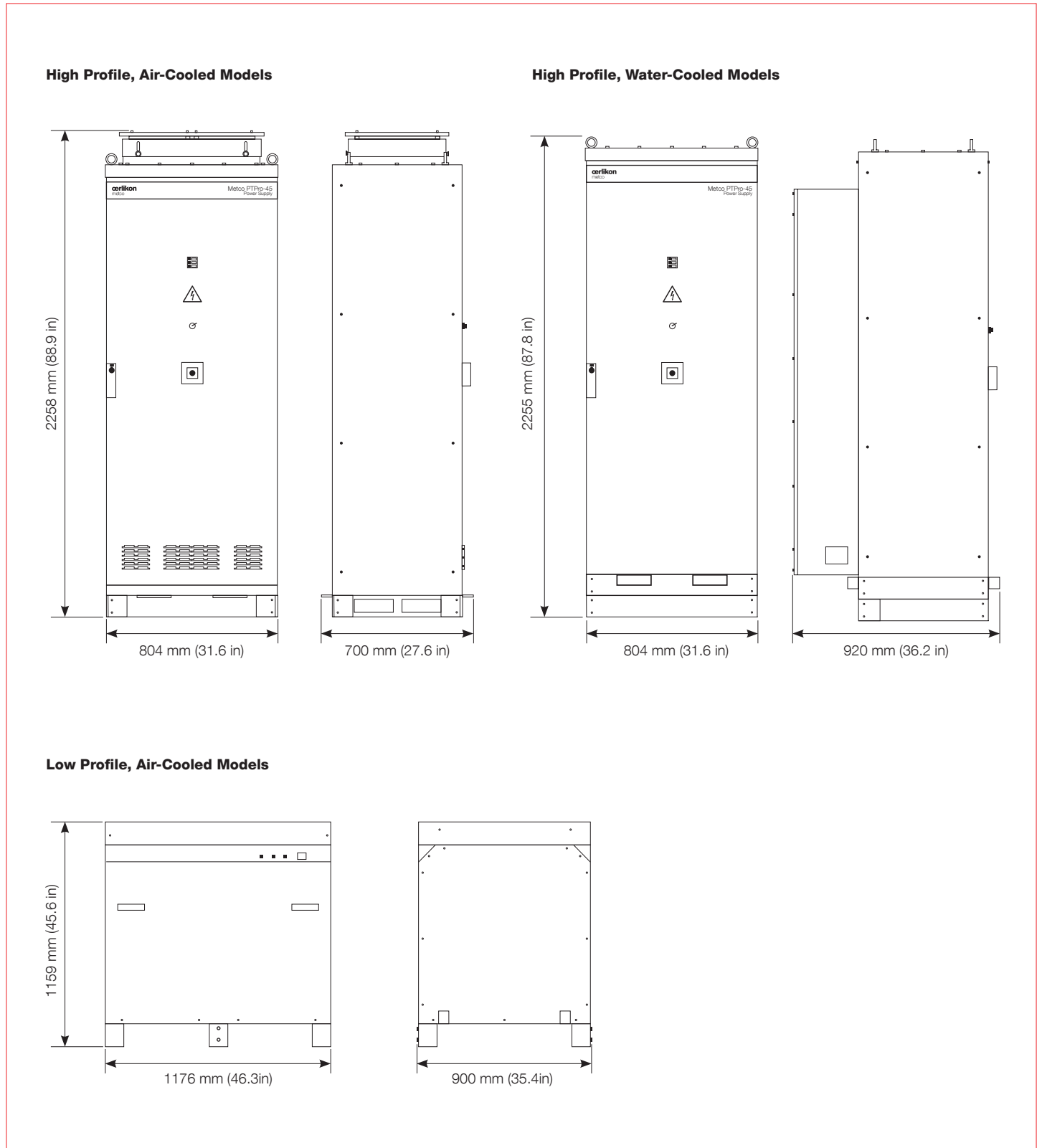
Environmental

- CE-conformant and complies with standards for electromagnetic compatibility (EMC Guideline 2004/108/ EC)
- Reduces overall energy consumption
- Low noise under normal load: < 78 dBA for Metco PTPro series supplies; < 63 dBA for Metco PTProW series supplies

^a Some functionality is limited when Metco PTPro power supplies are used in emulation mode

3 Technical Data

3.1 Dimensions



3.2 Specifications

Input Requirements		200 V	220 V	400 V	460 V	480 V	575 V
Power consumption ^a	Metco PTPro 45	50 kVA	50 kVA	50 kVA	50 kVA	-	50 kVA
	Metco PTPro 120	136 kVA	136 kVA	136 kVA	136 kVA	136 kVA	136 kVA
Line frequency		48 to 62 Hz	48 to 62 Hz	48 to 62 Hz	48 to 62 Hz	48 to 62 Hz	48 to 62 Hz
Input voltage		3 x 200 V eff ± 10%	3 x 220 V eff ± 10%	3 x 400 V eff ± 10%	3 x 460 V eff ± 10%	3 x 480 V eff ± 10%	3 x 575 V eff ± 10%
Max. line current	Metco PTPro 45	3 x 162 A	3 x 147.3 A	3 x 81 A	3 x 70.4 A	-	3 x 56.3 A
	Metco PTPro 120	3 x 432 A	3 x 392 A	3 x 216 A	3 x 187 A	3 x 180 A	3 x 150.3 A
Fuse	Metco PTPro 45	3 x 200 A	3 x 160 A	3 x 100 A	3 x 80 A	-	3 x 63 A
	Metco PTPro 120	3 x 450 A	3 x 400 A	3 x 224 A	3 x 200 A	3 x 200 A	3 x 160 A
Output		Metco PT Pro 45		Metco PT Pro 120			
Power factor (cos φ)		≥ 0.95		≥ 0.95			
Efficiency		≥ 90 %		≥ 90 %			
Power rating	max	45 kW		120 kW			
Output	100 % duty cycle	800 A @ 55 V		1200 A @ 90 V; 540 A @ 200 V			
Output voltage range		25 to 240 V _{DC}		25 to 240 V _{DC}			
Current output signal accuracy	relative	± 1 % of full scale		± 1 % of full scale			
	absolute	± 8.0 A _{DC}		± 12.0 A _{DC}			
Voltage output signal accuracy	relative	± 2 % of full scale		± 2 % of full scale			
	absolute	± 6.0 V _{DC}		± 6.0 V _{DC}			
Environment							
Storage temperature	cooling circuit empty	-25 to 70 °C (-13 to 158 °F)			-25 to 70 °C (-13 to 158 °F)		
	cooling circuit full	-18 to 70 °C (0 to 158 °F)			-18 to 70 °C (0 to 158 °F)		
Operating temperature	air-cooled	5 to 40 °C (41 to 104 °F)			5 to 40 °C (41 to 131 °F)		
	water-cooled ^b	5 to 55 °C (41 to 104 °F)			5 to 55 °C (41 to 131 °F)		
Relatively humidity	non-condensing	15 % to 90 %			15 % to 90 %		
Altitude	max above sea level	1000 m (3280 ft)			1000 m (3280 ft)		
Location Requirements (minimums) ^c							
Front easement		850 mm (33.5 in)			850 mm (33.5 in)		
Rear easement		850 mm (33.5 in)			850 mm (33.5 in)		
Overhead easement		600 mm (23.75 in)			600 mm (23.75 in)		
Safety							
Cabinet	air-cooled	IP21S			IP21S		
	water-cooled	IP54			IP54		
Performance		PLd / Cat. 2			PLd / Cat. 2		
Protection class		1			1		
Over voltage category		III			III		
Pollution degree rating	Exterior to cabinet	3			3		
	Interior of cabinet	2			2		
Weight (approx.)							
High profile models	air-cooled	535 kg (1180 lb)			765 kg (1687 lb)		
	water-cooled	610 kg (1345 lb)			840 kg (1852 lb)		
Low profile models	air-cooled	---			765 kg (1687 lb)		

^a Continuous

^b At water temperature < 18 °C (< 64.5 °F) and flow rate of 600 l/h (2.6 gal/min)

^c Includes accessibility for doors and space for cooling air inlet / exhaust; does not include additional space requirements for personnel access

Information is subject to change without prior notice.

oerlikon
metco

4 Life-Cycle Status and Support Options

Our four-phase life cycle model keeps you informed about available services and support options throughout the life span of your equipment



4.1 PTPro Plasma Power Supplies

- Current Life Cycle Status: Active
- Inception Date: November 2017

During the Active phase, you have our full support and range of services. Using our life-cycle services will keep your equipment in the best operating condition.

4.2. Keeping You Informed

We will notify you early and transparently about your options as your equipment enters into the next life-cycle phase, providing your equipment is registered with Oerlikon Metco

4.2.1. Life-Cycle Notification

Provides early information about the upcoming life-cycle phase change and how your equipment can be best supported.

4.2.2. Life-Cycle Status Statement

Provides information about the current life-cycle status and all available options and services to maintain your equipment in best condition.

4.3. The Oerlikon Metco Difference

Benefit from our selection of comprehensive services designed to ensure:

- Consistent spray quality, with little to no parameter shift
- Compliance with your ISO quality requirements
- Maximized equipment uptime
- Extended overall equipment lifetime
- Fast availability of spare parts

4.4. Your Best Value for Peak Performance

Choose from our broad portfolio of services to keep your equipment in top condition now and in the future

- Spare parts
- Preventive maintenance
- Repair Service
- Customer training

Take advantage of an Oerlikon Metco Service Agreement tailored to your specific needs!

For more information on your service and support options, please contact your Oerlikon Metco Account Manager.