

## **Product Data Sheet**

### **Metco PT3X IPS Series Plasma Power Supplies**

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

The Metco™ PT3X IPS 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 PT3X IPS 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 PT3X IPS power supplies have very high electrical efficiency of greater than 90 %, thereby substantially reducing energy costs.

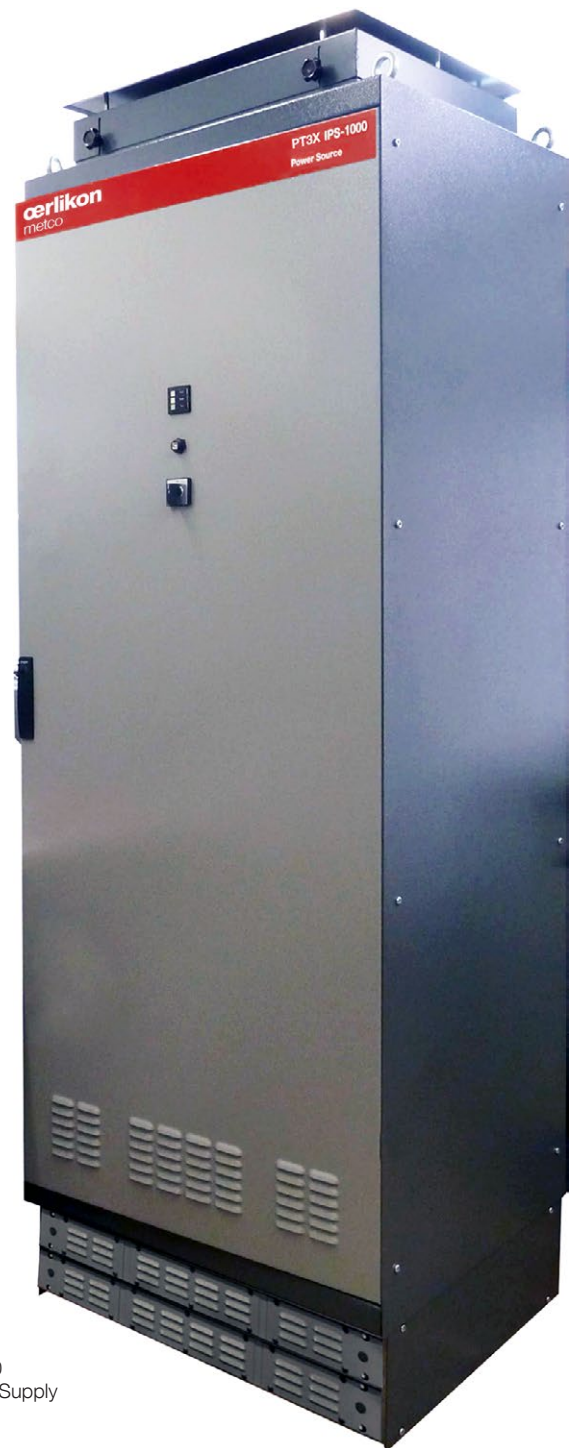
Because PT3X IPS series power supplies have fast, precise control features, they generate a nearly ideal high frequency DC waveform. This results in a more uniform and stable plasma plume with improved feedstock melting behavior.

#### **1 General Description**

The PT3X IPS series power supplies for operation with single-cathode plasma spray guns generates an almost ideal DC waveform with minimum ripple. Accordingly, the melting behavior of the powdered feedstock materials are optimized and the service life of anodes and cathodes are extended significantly.

Based on pulsed-power and IGBT (Insulated Gate Bipolar Transistor) technologies, the PT3X IPS power supplies provide faster and more precise control that is unmatched by previous plasma power supplies with constant-current characteristics.

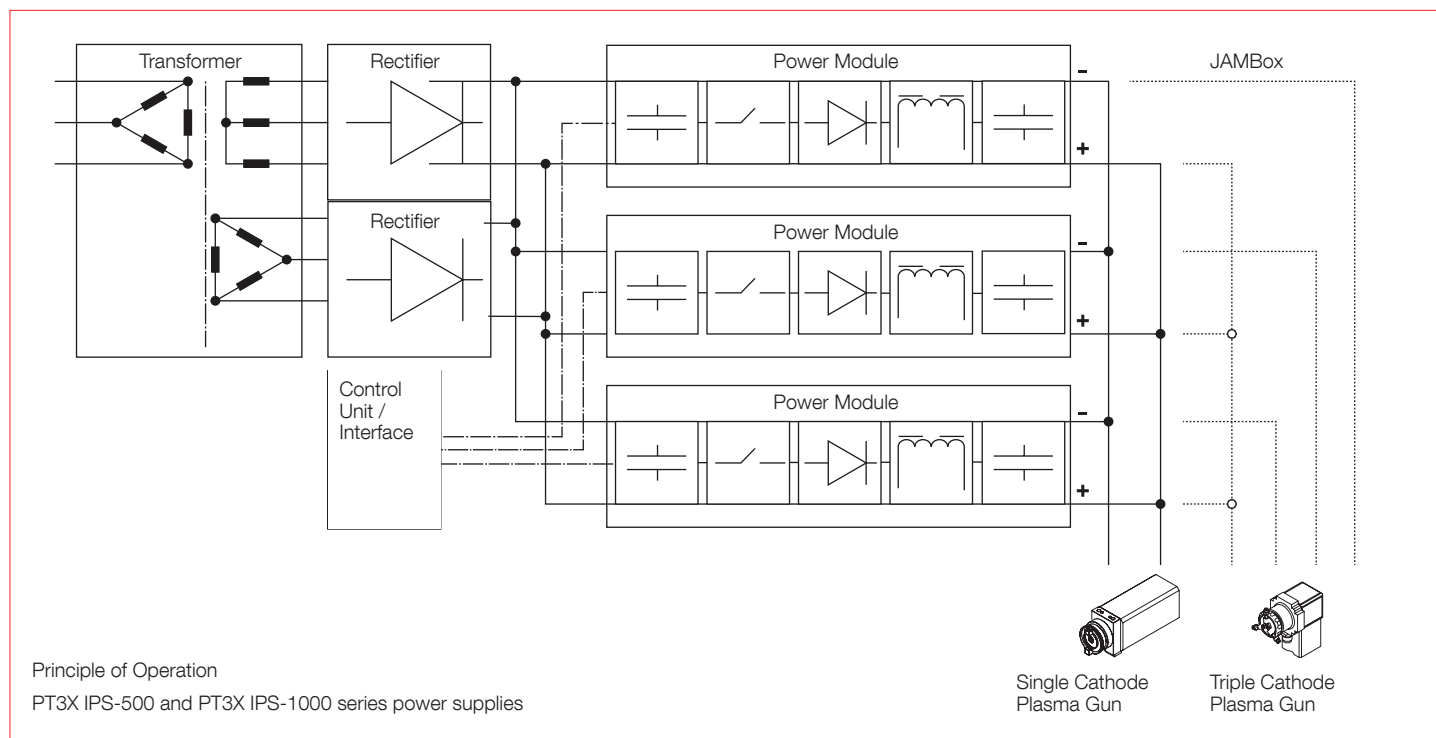
The PT3X IPS series power supplies are digitally controlled. This ensures that the instantaneous and dynamic plasma process behavior operates within the prescribed process window and in accordance with the specified spray parameters.



PT3X IPS-1000  
Plasma Power Supply

PT3X IPS 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.

PT3X IPS-500 and PT3X IPS-1000 series power supplies are equally well-suited for systems using single-cathode and TriplexPro™-series triple-cathode spray guns. For Cham-Pro™ systems, up to three PT3X IPS-1000 series power supplies can be connected in series to provide up to 3000 A of current.



## 1.1 PT3X IPS Models

Model	No. of Units <sup>a</sup>	100% Duty Cycle Rating	Single-Cathode Spray Guns <sup>b</sup>	Triple-Cathode Spray Guns <sup>b</sup>	Air-Cooled <sup>c</sup>	Water-Cooled <sup>d</sup>
PT3X IPS-400	1	400 A @ 100 V	✓		✓	
PT3X IPSW-400		660 A @ 60 V				
PT3X IPS-500	1	500 A @ 200 V	✓	✓	✓	
PT3X IPSW-500		800 A @ 80 V				
PT3X IPS-1000	1	500 A @ 130 V <sup>e</sup>	✓	✓	✓	
PT3X IPSW-1000		1000 A @ 80 V				
PT3X IPS-500	2	1000 A @ 200 V	✓	✓	✓	
PT3X IPSW-500		1600 A @ 80 V				
PT3X IPS-500	3	1500 A @ 200 V	✓	✓	✓	
PT3X IPSW-500		2400 A @ 80 V				
PT3X IPS-1000	2	1000 A @ 130 V <sup>e</sup>	✓	✓	✓	
PT3X IPSW-1000		2000 A @ 80 V				
PT3X IPS-1000	3	1500 A @ 130 V <sup>e</sup>	✓	✓	✓	
PT3X IPSW-1000		3000 A @ 80 V				

<sup>a</sup> Multiple units are connected in parallel

<sup>b</sup> 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

<sup>c</sup> Air-cooled units can be used in environments with ambient temperatures up to 40 °C (104 °F)

<sup>d</sup> Water-cooled units can be used in environments with ambient temperatures up to 55 °C (131 °F)

<sup>e</sup> At nominal input values

## 2 Features and Benefits

### Effective

- Nearly ideal DC current characteristics with negligible residual ripple for very stable power output
- Configurable for conventional single-cathode plasma guns or triple-cathode guns such as Oerlikon Metco's TriplexPro-210 (except PT3X IPS-400 series supplies)
- Multiple PT3X power supply units can be connected in parallel for high power requirements of up to 3000 A
- 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
- PT3X IPSW 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)

### Efficient

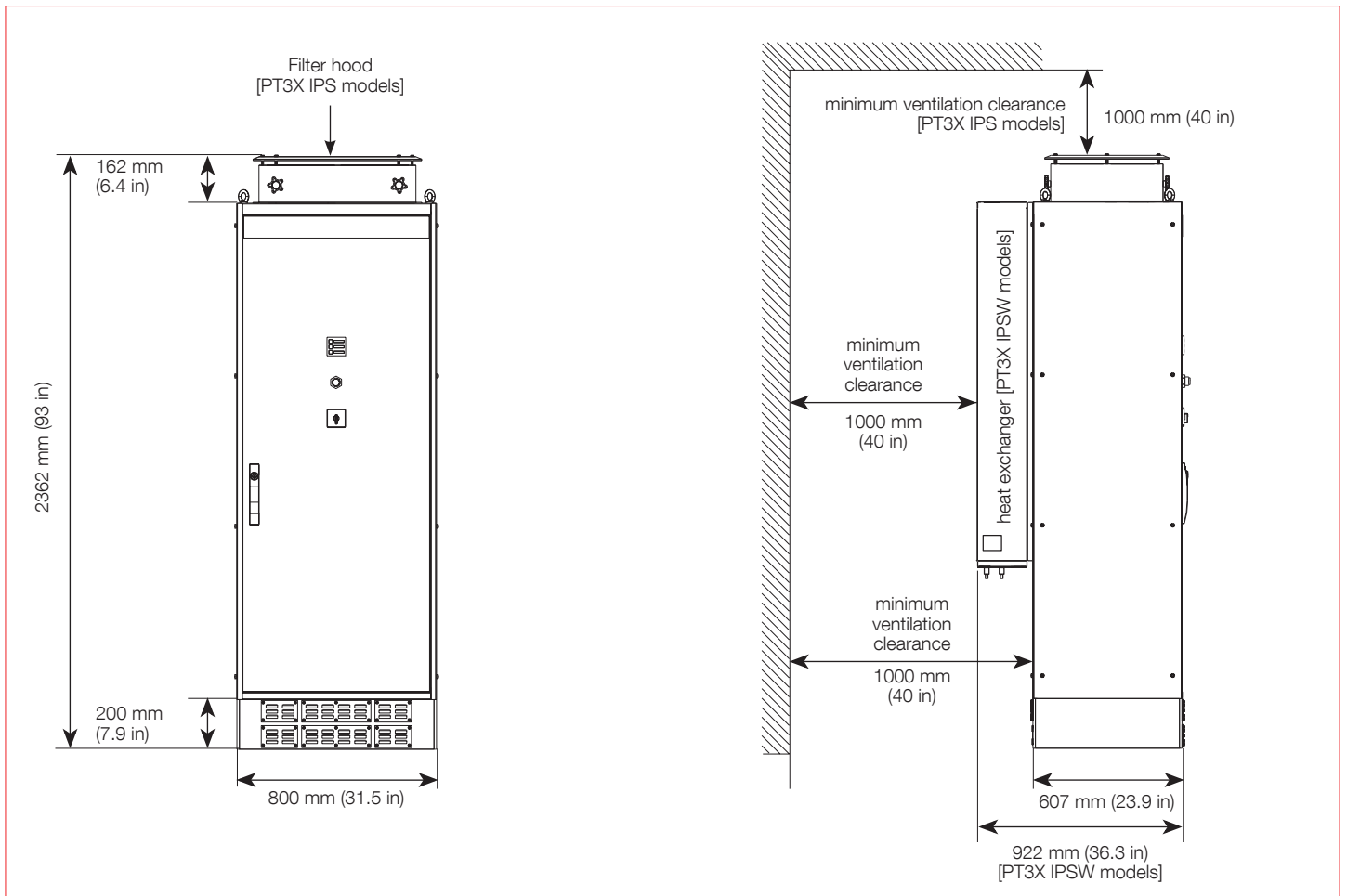
- Stable power, even at low amperage, ensures low power extension guns operate reliably and efficiently
- New ignition management system quickly stabilizes the power output to protect gun components
- A booster circuit allows the use of nitrogen gas for gun ignition
- Status indication with PT3X Control 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 PT3X IPS series supplies; < 63 dBA for PT3X IPSW series supplies

## 3 Technical Data

### 3.1 Dimensions



## 3.2 Specifications

	Model <sup>a</sup>	200 V	220 V	400 V	460 V	575 V
Ambient operating temperature		+ 5 °C to + 40 °C (+ 41 °F to + 104 °F)				
Storage temperature		- 18 °C to + 70 °C (0 °F to + 158 °F)				
Cooling air relative humidity		15 to 90 %, non-condensing				
Noise emission	IPS series	≤ 78 dB(A)				
	IPSW series	≤ 63 dB(A)				
Line frequency <sup>b</sup>		50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	60 Hz	60 Hz
Input voltage	IPS-400 / IPSW-400	---	---	3 x 400 V	---	---
	IPS-500 / IPSW-500	3 x 200 V	3 x 220 V	3 x 400 V	3 x 460 V	3 x 575 V
	IPS-1000 / IPSW-1000	3 x 200 V	3 x 220 V	3 x 400 V	3 x 460 V	3 x 575 V
Max. current rating	IPS-400 / IPSW-400	---	---	3 x 65 A	---	---
	IPS-500 / IPSW-500	3 x 360 A	3 x 326 A	3 x 180 A	3 x 155 A	3 x 125 A
	IPS-1000 / IPSW-1000	3 x 290 A	3 x 264 A	3 x 145 A	3 x 125 A	3 x 100 A
Fuse	IPS-400 / IPSW-400	---	---	3 x 80 A	---	---
	IPS-500 / IPSW-500	3 x 400 A	3 x 400 A	3 x 200 A	3 x 160 A	3 x 160 A
	IPS-1000 / IPSW-1000	3 x 315 A	3 x 250 A	3 x 160 A	3 x 160 A	3 x 125 A
Power factor (cos φ)		≥ 0.95				
Efficiency		≥ 90 %				
Setting range, stepless	IPS-400 / IPSW-400	30 A to 400 A @ 30 V to 100 V; 30 A to 660 A @ 50 V				
	IPS-500 / IPSW-500	30 A to 500 A @ 40 V to 200 V; 30 A to 800 A @ 80 V				
	IPS-1000 / IPSW-1000	100 A to 1000 A @ 40 V to 80 V				
Constant load	IPS-400 / IPSW-400	600 A / 60 V (single-cathode spray gun)				
	IPS-500 / IPSW-500	800 A / 80 V (single cathode spray gun); 500 A / 200 V (triple-cathode spray gun)				
	IPS-1000 / IPSW-1000	1000 A / 80 V (single- or triple-cathode spray gun)				
Accuracy: set point vs. actual <sup>c</sup>		± 1 % of full scale				
Voltage setting vs. actual value		1 V = 40 V <sub>DC</sub>				
Current setting vs. actual value		1 V = 100 A <sub>DC</sub>				
Open circuit voltage <sup>d</sup>	IPS-400 / IPSW-400	approx. 150 V				
	IPS-500 / IPSW-500	approx. 300 V				
	IPS-1000 / IPSW-1000	approx. 150 V				
Power Consumption <sup>e</sup>	IPS-400 / IPSW-400	approx. 45 kVA				
	IPS-500 / IPSW-500	approx. 112kVA				
	IPS-1000 / IPSW-1000	approx. 90 kVA				
Mains supply lead [mm <sup>2</sup> Cu]	IPS-400 / IPSW-400	---	---	4 x 70	---	---
	IPS-500 / IPSW-500	4 x 185	4 x 185	4 x 70	4 x 70	4 x 50
	IPS-1000 / IPSW-1000	4 x 150	4 x 120	4 x 70	4 x 70	4 x 50
Connection to JAMBox [mm <sup>2</sup> Cu] <sup>f</sup>		3 x 95				
Weight (approx.)	IPS-400	520 kg (1146 lb)				
	IPSW-400	560 kg (1235 lb)				
	IPS-500	670 kg (1477 lb)				
	IPSW-500	768 kg (1693 lb)				
	IPS-1000	625 kg (1378 lb)				
	IPSW-1000	723 kg (1594 lb)				
Cooling Capacity	IPSW-400	5 200 W				
	IPSW-500	10 000 W				
	IPSW-1000	10 000 W				

<sup>a</sup> All models, except when noted

<sup>b</sup> IPS-400 series only available with a line frequency of 50 / 60 Hz

<sup>c</sup> Measured with a shunt cl. 0.5

<sup>d</sup> Excluding ignition current circuit

<sup>e</sup> Continuous

<sup>f</sup> For each connection

Information is subject to change without prior notice.