



Perfection in sight: Pulsed processes for spotless films. TruPlasma DC Series 4000 (G2).

The TruPlasma DC Series 4000 (G2) power supplies are especially designed to serve reactive sputtering processes of difficult materials. Whether PVD or PECVD, the generators prove themselves in critical industrial plasma processes. These include solar cells manufacturing, production of semiconductors and hard coating applications. At output powers ranging from 10 to 200 kilowatts (stackable), the generators deliver their maximum power across a wide load impedance range. Fast DSP control allows thereby for stable processes and low arc-time related losses.

TruPlasma DC Series 4000 (G2) combines the advantages of TRUMPF Hüttinger's excellent arc management and DC pulse technology. Thus reaching even less droplets and lower substrate damages in critical coating processes. Combined with an inherent very low stored energy, this considerably improves the overall process quality and production throughput.

Features

- Extremely low arc energy
- Ultrafast digital control platform
- Adjustable reverse voltage
- Wide range of adjustable parameters: frequency and pulse parameters
- High sophisticated monitoring tools
- Full water cooling

Benefits

- High film quality and production yield
- Stable plasma and low arc-related time losses
- Simple adoption to different process requirements
- Allows for a wide range of applications with one device
- Fast and easy process optimization
- Compact size, easy system integration

TruPlasma DC Series 4000 (G2)

Output Parameters		
Output Power	10 kW, 20 kW, 40 kW	
Output Frequency	2 kHz – 100 kHz	
Output Voltage	1000 V, 1200 V	
Output Current	25 A, 50 A, 100 A, 33 A, 66.5 A, 133 A	
Regulation Modes	Power, voltage, current	
Efficiency	> 90 %	
Operation Duty Cycle	10 % – 100 %	
Reverse voltage	Adjustable 0 V – 100 V	
Regulation Line \pm 10 % Load 10 % – 90 %	Accuracy	\pm 0.5 %
	Repeatability	\pm 0.2 %
Output Polarity	Floating	

Arc Detection Criteria	
Arc Handling Capability	Up to 20 kArcs / sec
Arc Detection Time	< 100 ns
I_{max} Detection	Var. I_{max} threshold: 10 % – 130 %
Cross Detection (U x I)	Var. U_x threshold: 0 % – 90 % Var. I_x threshold: 5 % – 100 %
Dynamic Voltage Change	Var. dU threshold: 5 % – 80 % U_n

Input parameters	
Line Voltage	3 x 400 V – 480 V \pm 10 %
Line Frequency	50 Hz / 60 Hz \pm 5%

Cooling Specifications	
Max. Water Pressure	Up to 7 bar
Min. Differential Pressure	2 bar
Water Flow	8 l/min
Max. Cooling Water Temperature	Up to +35 °C

Environmental Specifications	
Ambient Temperature	+5 °C to +45 °C operating -25 °C to +55 °C storage
Relative Humidity	5 % – 85 % non condensing
Air Pressure ¹	860 hPa – 1 060 hPa

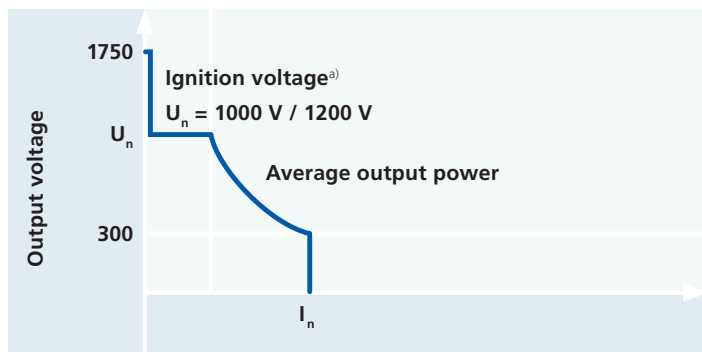
1) Max. 2 000 m above sea level.

Interfaces	
Analog / Digital	25-pin Sub-D
RS 232 / RS 485	9-pin Sub-D
PROFIBUS	9-pin Sub-D
EtherCAT ²	2 x RJ45
DeviceNet ²	5-pin DeviceNet Connector

2) Available upon request.

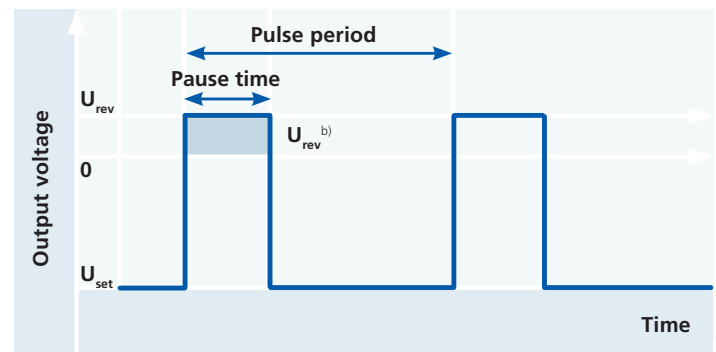
Dimensions (W x H x D, mm)	
TruPlasma DC 4010 / 4020	482 (19") x 178 (4U) x 720
TruPlasma DC 4040	482 (19") x 357 (8U) x 720
Weight	
TruPlasma DC 4010 / 4020	60 kg / 75 kg
TruPlasma DC 4040	150 kg

V/I Diagram



a) Adjustable ignition voltage – available upon request.

Adjustable reverse voltage



b) Adjustable reverse voltage (0 – 100 V) independent from working voltage.

TruPlasma DC 4040 (G2)

