

Brilliant Reflections: HÜTTINGER makes optical coatings shine.



## Perfection in sight: Pulsed processes for spotless films. TruPlasma DC Series 4000.

The TruPlasma DC Series 4000 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 5 to 20 kilowatts, 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 combines the advantages of 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

- Low Arc Energy
- Short after-arc break and recovery time
- Fast DSP Control
- Synchronous Pulsing
- Wide range of adjustable parameters: frequency and pulse parameters

### Benefits

- Limited droplets and substrate damage rates
- Increased production yield
- Stable plasma and low arc-related time losses
- Easy process optimization and user friendly operation
- Allows for a wide range of applications with one device

**TRUMPF**



TRUMPF Group

**HÜTTINGER Elektronik**  
generating confidence

## TruPlasma DC Series 4000

### Output Parameters<sup>1</sup>

<b>Output Power</b>	5 kW, 10 kW, 20 kW	
<b>Output Frequency</b>	2 kHz – 100 kHz	
<b>Output Voltage</b>	800 V	
<b>Output Current</b>	12.5 A, 25 A, 50 A	
<b>Regulation Modes</b>	Power, voltage, current, SimReg	
<b>Efficiency</b>	88 % – 94 %	
<b>Operation Duty Cycle</b>	100 %	
<b>Regulation Line ± 10 % Load 10 % – 90 %</b>	<b>Accuracy</b>	± 0.5 %
	<b>Repeatability</b>	± 0.2 %
<b>Output Polarity</b>	Negative	

1) TruPlasma DC Series 4000 is not available in US, JP, CH, DE, FR, GB, IT, LI.

### Arc Detection Criteria

<b>Arc Handling Capability</b>	Up to 2 kArcs / sec
<b>Pause time</b>	1 μs – 10 μs
<b>Arc Detection Time</b>	500 ns
<b>I<sub>max</sub> Detection</b>	Var. I <sub>max</sub> threshold: 10 % – 130 %
<b>Cross Detection (U x I)</b>	Var. U <sub>x</sub> threshold: 0 V – 600 V Var. I <sub>x</sub> threshold: 10 % – 100 %
<b>Dynamic Voltage Change</b>	Var. dU threshold: 0 V – 400 V

### Input parameters

<b>Line Voltage</b>	3 x 400 V ± 10 %
<b>Line Frequency</b>	50 Hz / 60 Hz ± 5 %

### Cooling Specifications

<b>Cooling System</b>	Forced Air Cooling / Fan Control
<b>Max. Inlet Air Temperature</b>	+ 35 °C

### Environmental Specifications

<b>Ambient Temperature</b>	+5 °C to +35 °C operating -25 °C to +55 °C storage
<b>Rel. Air Humidity</b>	80 % non condensing
<b>Max. Operating Altitude</b>	2 000 m above sea level <sup>2</sup>

2) Special high altitude versions available upon request.

### Interfaces

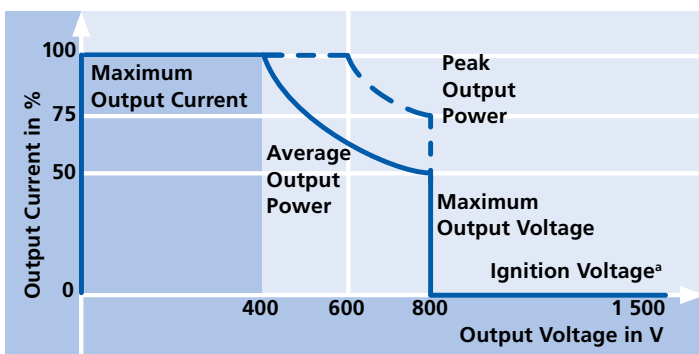
<b>Analog</b>	25 pin Sub-D
<b>RS 232 / RS 485</b>	9-pin Sub-D
<b>PROFIBUS<sup>3</sup></b>	9-pin Sub-D
<b>Connection Type</b>	Rear

3) Optionally available.

### Dimensions (W x H x D)

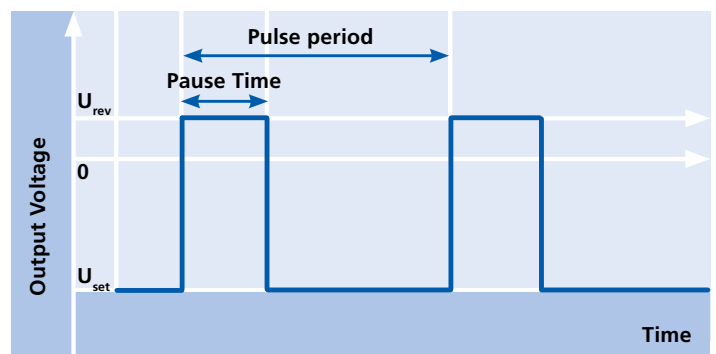
<b>TruPlasma DC 4005 / 4010</b>	483 mm x 133 mm x 733 mm
<b>TruPlasma DC 4020</b>	483 mm x 275 mm x 733 mm
<b>Weight</b>	
<b>TruPlasma DC 4005</b>	30 kg
<b>TruPlasma DC 4010</b>	42 kg
<b>TruPlasma DC 4020</b>	60 kg

### V/I Diagram



a) Adjustable ignition voltage.

### Pulse mode



### TruPlasma DC 4020

