

Powering processes with unprecedented stability
TruPlasma RF Series 1000 / 3000

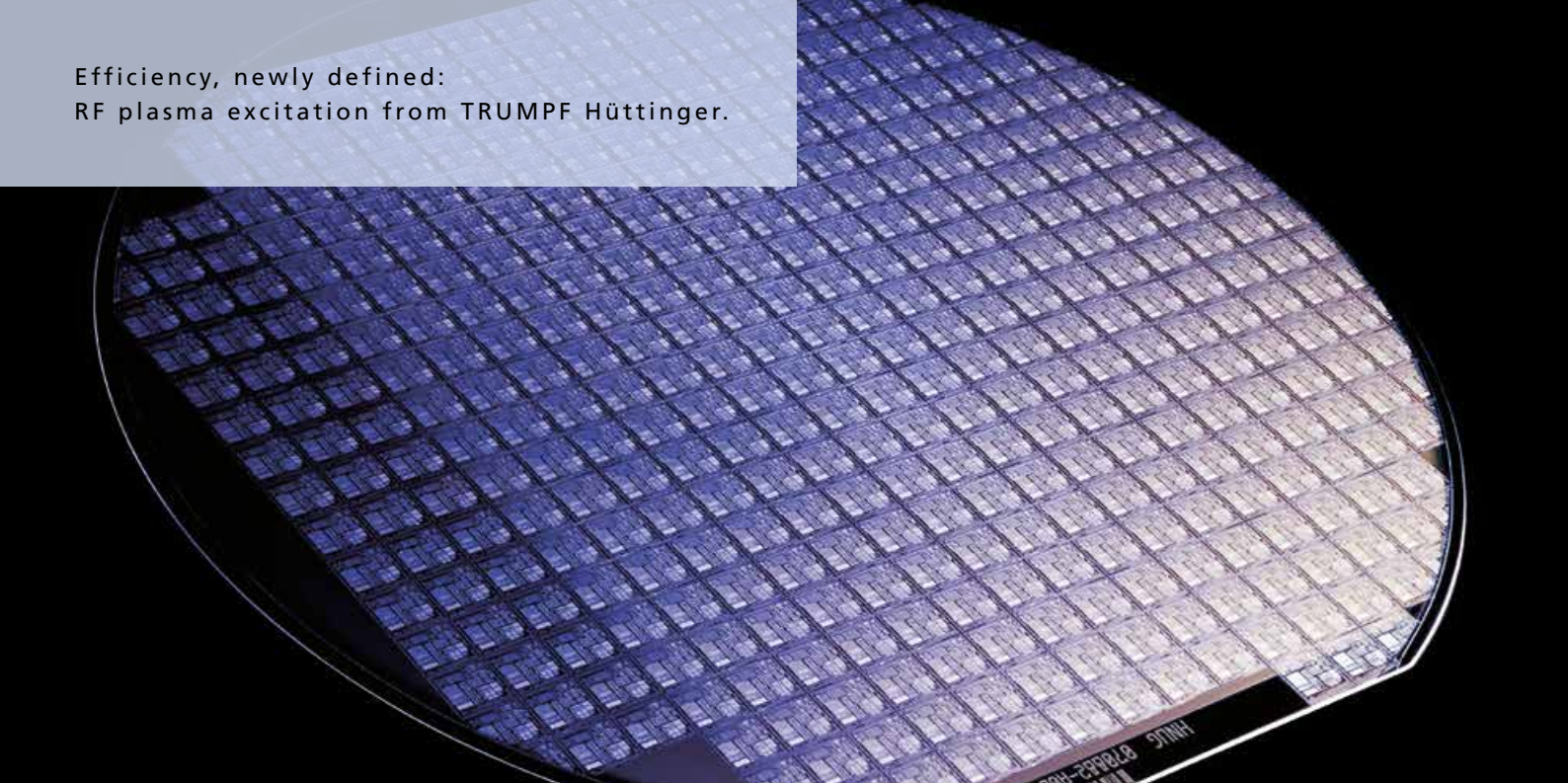


TruPlasma RF Series 1000 / 3000



TRUMPF Hüttinger
generating confidence

Efficiency, newly defined:
RF plasma excitation from TRUMPF Hüttinger.



Stable RF power for best productivity in PECVD processes. TruPlasma RF Series 1000 / 3000.

When it comes to film deposition in the manufacturing of complex micro-structures, process reproducibility is the key to consistent results. TRUMPF Hüttinger's TruPlasma RF Series 1000 / 3000 provides exceptionally power output stability and operational reliability. Designed with a focus on RF plasma processes in semiconductor applications, its features are also suited to ensure best results and productivity in photovoltaic and surface treatment processes. Typical applications include PECVD and PVD as well as dry etching processes.

The TruPlasma RF Series 1000 / 3000 leverages two innovative technologies that incorporate today's demand for clean energy and efficient processing and lead to substantial benefits: Reduced power consumption and cooling requirements, resulting in reduced operational costs.

First, especially for low power outputs, a high output setpoint accuracy can be realized through phase shift regulation. This enables the user to exert a very precise process control both at high and low power and ensure reproducible results at the highest productivity levels.

Secondly, TRUMPF Hüttinger's unique power coupling technology, Combine Line, achieves an exceptional robust power supply. Even in processes with strong plasma fluctuations, the inherent selfprotection features of the power supply guarantee uninterrupted power delivery. Thus, CombineLine efficiently protects the power supply in all inevitable plasma load impedance mismatch situations. Additionally, a special power conversion topology with an unsurpassed efficiency factor of more than 80 percent addresses the need to lower operational cost for thin film deposition tools.

The RF generators are available with 1, 2 or 3 kilowatts output power and offer an output power range from 1 watt to their maximum, operating at a frequency of 13.56 MHz. With its compact half 19 inch design, the TruPlasma RF Series 1000 / 3000 power supply can easily be integrated into film deposition tools. Due to the true 50 Ohm output impedance, any length of cable can be selected for connection to the matchbox. TRUMPF Hüttinger also offers a set of automatching networks for ideal power transfer into the process chamber.

Features

- Best in class energy efficiency factor of > 80 %
- Particularly robust power supply
- True 50 Ohm output impedance
- Accurate control at low power levels
- Free selection of cable length between generator and matchbox

Benefits

- Reduces operational cost
- Maximum system uptime, even in critical processes
- Stable processes for best productivity
- High reproducibility of process results
- Easy and cost-efficient integration in film deposition tools

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Output Parameters

Output Power	1 kW, 2 kW, 3 kW
Min. Output Power	1 W
Reflected Power Limit (VSWR ∞)	600 W
Operating Frequency	13.56 MHz \pm 0.005 %

Pulsed Operation Parameters

Pulse Frequency	10 Hz – 50 kHz
Duty Cycle	1 % – 99 %
Min. Pulse on Time	10 μ s
Min. Pulse off Time	10 μ s

Input Parameters

Line Voltage	3 x 200 V \pm 10 % 3 x 208 V \pm 10 %
Line Frequency	50 Hz / 60 Hz \pm 3 Hz
Power Factor¹	> 0.85
Overall Efficiency (Line to Load)¹	> 80 %
Current at 208 V mains	12 A per phase
Power Consumption at 208 V	4.3 kVA ²

1) At full rated power.

2) In worst case mismatch situation.

Cooling Specifications

Cooling System	Water
Air Cooling	Not required
Min. Water Flow Rate	4.0 l/min
Cooling Water Temperature	5 °C – 35 °C ³

3) The cooling water temperature must exceed the dew point of the ambient air.

Interfaces and Connections

Analog	0 – 10 VDC
Digital	PROFIBUS ⁴ RS 232 / RS 485 ⁴ DeviceNet
Mains Input Connection	Harting Han modular plug 30 A (male)
RF Output Connection	7/16 socket (female)

4) Either PROFIBUS or RS interface are available.

Dimensions (W x H x D)⁵	8.5" x 5.25" x 15" 216 mm x 133 mm x 381 mm
Weight	17 kg

5) Without connectors.

Protection Class	IP 40
Certification	CE, SEMI S2, SEMI F47

TruPlasma RF 1003

