



MP1

Unipolar Pulse Power Supply

Highest flexibility.

Supreme performance for Single Magnetron sputtering, Plasma Nitriding, and Bias applications

The MAGPULS Unipolar Pulse Power supplies series MP1 are designed for operating with single magnetrons for reactive sputtering on substrates as for metal and semiconductive materials. The enhanced ARC-management allows the unipolar pulse power supplies operation in high quality processes. Typical applications are production of hard coatings and plasma nitriding.

The MAGPULS Unipolar Pulse Power Supply series MP1 are constructed in two separate units. One unit is the DC power supply which provides the DC power into the big capacitor bank of the pulse unit and the pulse unit with the integrated sophisticated ARC management. The series MP1 is available with output power range from 5 kW up to 90 kW and pulse current from 35 A up to 400 A peak current.

The duty cycle can be adjusted within the range from 0.002% up to 99.998%. The new MAGPULS enhanced ARC management provides best coating results without process interruptions.

Optional the MP1 series provide an external optical Input interface for external controlling of the pulse times as well as an optical output interface for triggering or synchronization of other unipolar or bipolar pulse power supplies of series MP1 or MP2.

Features

Up to 2 different operating modes from DC up to bipolar pulsing

Adjustable pulse parameters and frequency

Enhanced ARC management

Benefits

Universal application range with one power supply

Optimal adjustment of the process and process stability

Best Arc suppression and lowest Arc-energy for best sputter performance and nitriding coatings



Technical Data

Output

	MP1-35	MP1-60	MP1-100	MP1-200	MP1-400
Voltage	0 - 1000V				
Current	0 - 10 A DC 0 - 35 A Pulse	0 - 20 A DC 0 - 60 A Pulse	0 - 40 A DC 0 - 100 A Pulse	0 - 80 A DC 0 - 200 A Pulse	0 - 150 A DC 0 - 400 A Pulse
Power	0 - 6 kW DC				
Pulse frequency	DC / 0.05 Hz - 100 kHz				
Max. frequency with Max. pulse current	100 kHz @ 10 A 25 kHz @ 35 A	100 kHz @ 25 A 40 kHz @ 60 A	100 kHz @ 25 A 20 kHz @ 100 A	100 kHz @ 50 A 20 kHz @ 200 A	75 kHz @ 100 A 20 kHz @ 400 A
Pulse time settings					
T_{on}	2.0 μs up to 100 sec				
T_{off}	2.0 μs up to 100 sec				
Pulse waveform	DC/Unipolar pulsed				

Input

	MP1-35	MP1-60	MP1-100	MP1-200	MP1-400
Max. Voltage	0 - 1000 V				
Max. Current	0 - 10 A DC	0 - 20 A DC	0 - 40 A DC	0 - 80 A DC	0 - 150 A DC
Max. Power	0 - 6 kW DC				
Mains supply	1AC 230V, 50/60Hz or 1AC 115V, 50/60Hz				



Arc Management

	MP1-35	MP1-60	MP1-100	MP1-200	MP1-400
I_{max} - Detection	0 A up to 35 A peak	0 A up to 60 A peak	0 A up to 100 A peak	0 A up to 200 A peak	0 A up to 400 A peak
ARC - Detection time	< 200 ns				
OFF time after ARC detection	30 μs up to 1000 ms				
di/dt dynamic change	Var. di/dt threshold: 0 A/μs up to 2000 A/μs				
Voltage drop ΔU	Var. U threshold: 0% up to 100% U _{DC} (option)				
U x I - cross Detection	Var. U threshold 0 V up to 1000 V Var. I threshold: 0.1 x max. I _{peak} up to 1 x max. I _{peak} (option)				
ARC - Detection time	< 100 ns				

Interface

	MP1-35	MP1-60	MP1-100	MP1-200	MP1-400
Analog	1 up to 3x15 pin-Sub-D for controlling the external DC power supplies				
Digital	15 pin Sub-D user Interface with floating potential contactors				
RS 232	9 pin Sub-D				
RS 485	9 pin Sub-D				
Ethernet	RJ 45 (Option)				
Profibus	9 pin Sub-D (Option)				

Cooling

	MP1-35	MP1-60	MP1-100	MP1-200	MP1-400
Cooling system	Air cooling	Water cooling			
Cooling temperature	Max. 35°C	20°C - 30°C			
Cooling medium	Air	Water pressure max. 6 bar			



Environmental Condition

	MP1-35	MP1-60	MP1-100	MP1-200	MP1-400
Ambient temperature	+5°C up to +35°C				
Max. humidity	80% non-condensing				
Max. operating altitude	1500 m above sea level				

Mechanical data of the pulse unit

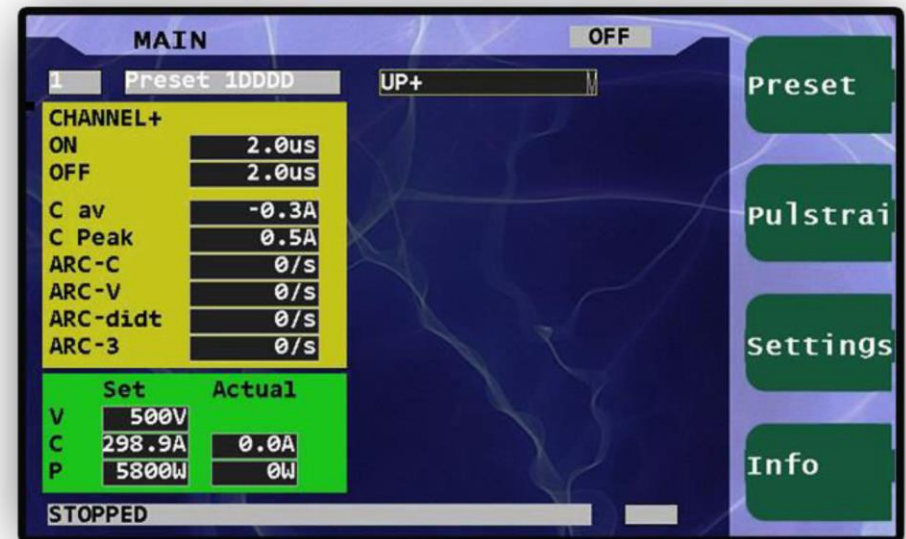
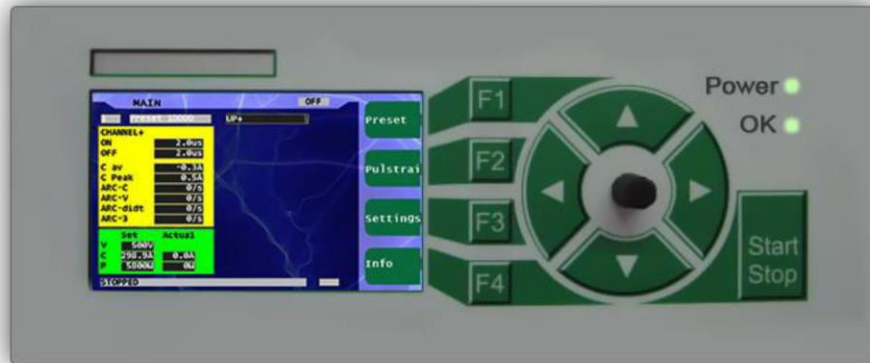
	MP1-35	MP1-60	MP1-100	MP1-200	MP1-400
construction	19" - rack 5 HU				19"-rack 10 HU
Dimension H x W x D	222.3 x 483 x 650 mm				444.5 x 483 x 650 mm
Weight	23 kg	27 kg	30 kg	32 kg	60 kg





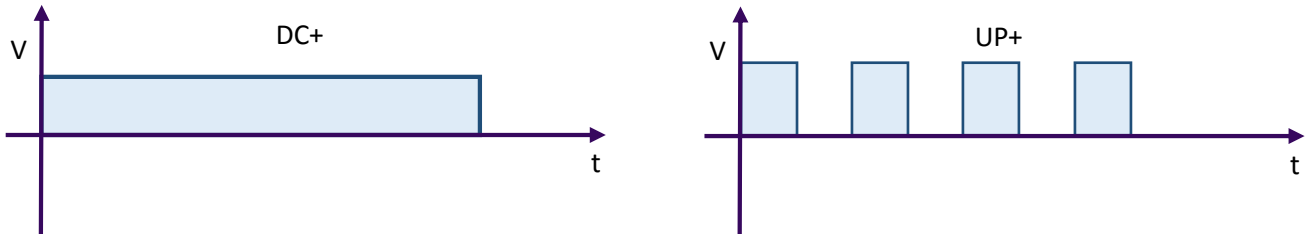
Display and Operating

	MP1-35	MP1-60	MP1-100	MP1-200	MP1-400
Display	Graphic color Display				
LED display	Power, OK, Start/Stop				
Operating	Graphic menu via function keys and Arrow keys with knob				





2 adjustable pulse waveforms



Rear side with connecting cables and water connection

