

MP 2 – HC Bipolar HIPIMS Pulse Power Supply

Highest flexibility.

Supreme performance for ambitious HIPIMS processes.

The MAGPULS HIPIMS Bipolar Pulse Power supplies series MP 2 - HC are designed for operating with dual magnetrons for reactive sputtering on substrates as for glass, plastics and metal. The individual operating modes and the enhanced ARC-management allows the bipolar pulse power supplies operation in high quality processes. Typical applications are production of flat panel displays, solar cells, decorative and hard coatings.

The MAGPULS Bipolar Pulse Power Supply series MP 2 – HC 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 MP 2 – HC is available with output power range from 1kW up to 60kW and pulse current from 200A up to 1500A peak current.

The duty cycle for each half wave can be independently adjusted to control the target utilization. The new MAGPULS enhanced ARC management provides best HIPIMS coating results without process interruptions.

Optional the MP 2 - HC 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 bipolar pulse power supplies of series MP 2.

Features

- Up to 7 different operating modes from DC up to bipolar pulsing
- Adjustable pulse parameters and frequency
- Independent settings for positive and negative pulse times and Arc parameters
- Enhanced ARC management

Benefits

- Universal application range with one power supply
- Optimal adjustment of the process and process stability
- Controllable power input and optimized target utilization
- Best Arc suppression and lowest Arc-energy for best sputter performance



Technical Data

Output

	MP2-HC 200	MP2-HC 400	MP2- HC 600	MP2-HC 1000	MP2-HC 1500
Voltage	0 – 1000V				
Current	0 – 20 A DC 0 – 200 A Puls	0 – 40 A DC 0 – 4000 A Puls	0 – 60 A DC 0 – 600 A Puls	0 – 100 A DC 0 – 1000 A Puls	0 – 150 A DC 0 – 1500A Puls
Power	0 – 10kW DC	0 – 20 kW DC	0 – 30 kW DC	0 – 60 KW DC	0 – 90kW DC
Pulse frequency	DC / 0.05Hz – 100kHz	DC / 0.05Hz – 50kHz	DC / 0.05Hz – 50kHz	DC / 0.05Hz – 50kHz	DC / 0.05Hz – 50kHz
Max. frequency with Max. pulse current	100 kHz @ 40 A 2 kHz @ 200 A	50 kHz @ 80 A 2 kHz @ 400 A	50 kHz @ 105 A 2 kHz @ 600 A	50 kHz @ 120 A 2 kHz @ 1000 A	50 kHz @ 120 A 2 kHz @ 1500 A
Pulse time settings	T _{on+} 5.0 μs up to 100 sec T _{on-} 5.0 μs up to 100 sec T _{off+} 5.0 μs up to 100 sec T _{off-} 5.0 μs up to 100 sec				
Pulse wave form	DC+ / DC- / Unipolar pulsed + / Unipolar pulsed - / Bipolar pulsed / programmable pulse pattern				

Input

	MP2-HC 200	MP2-HC 400	MP2-HC 600	MP2-HC 1000	MP2-HC 1500
Max. Voltage	0 – 1000V				
Max. Current	0 – 20 A DC	0 – 40 A DC	0 – 60 A DC	0 – 100 A DC	0 – 150 A DC
Max. Power	0 – 10kW DC	0 – 20 kW DC	0 – 30 kW DC	0 – 60 KW DC	0 – 90kW DC
Mains supply	1AC 230V, 50/60Hz or 1AC 115V, 50/60Hz				



Arc Management

	MP2-HC 200	MP2-HC 400	MP2-HC 600	MP2-HC 1000	MP2-HC 1500
I_{max} - Detection	0 A up to ±200 A peak	0 A up to ±400 A peak	0 A up to ±600 A peak	0 A up to ±1000A peak	0 A up to ±1500 A peak
ARC – Detection time	> 200ns				
OFF time after ARC detection	500 µs up to 1000 ms				
di/dt dynamic change	Var. di/dt threshold: 0A/µs up to 2000A/µs				
Voltage drop ΔU	Var. U threshold: 0% up to 100% U _{DC} (option)				
U x I – cross Detection	Var. U threshold 0V up to 1000V Var. I threshold: 0.1 x max. I _{peak} up to 1 x max. I _{peak} (option)				
ARC – Detection time	> 100ns				

Interface

	MP2-HC 200	MP2-HC 4000	MP2-HC 600	MP2-HC 1000	MP2-HC 1500
Analog	1 up to 3 x 15 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

	MP2-HC 200	MP2-HC 4000	MP2-HC 600	MP2-HC 1000	MP2-HC 1500
Cooling system	Water cooling				
Cooling temperature	20°C – 30°C				
Cooling medium	Water pressure max. 6 bar				



Environmental Condition

	MP2-HC 200	MP2-HC 400	MP2-HC 600	MP2-HC 1000	MP2-HC 1500
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

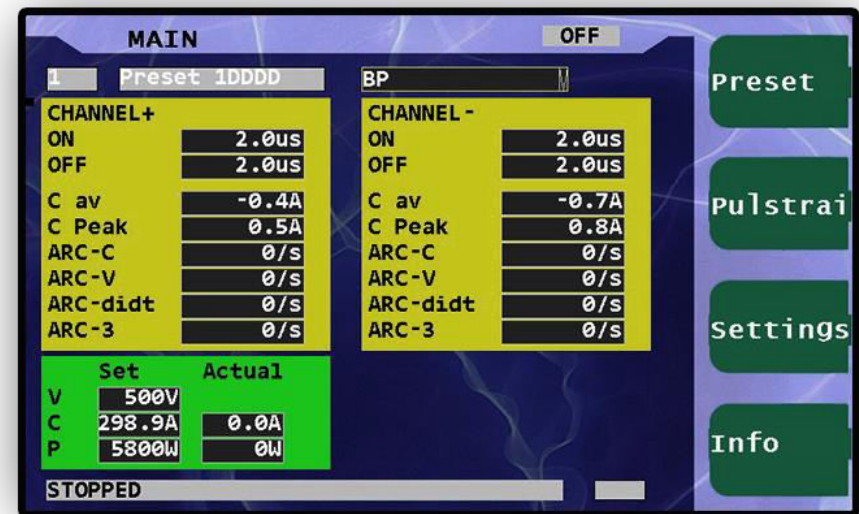
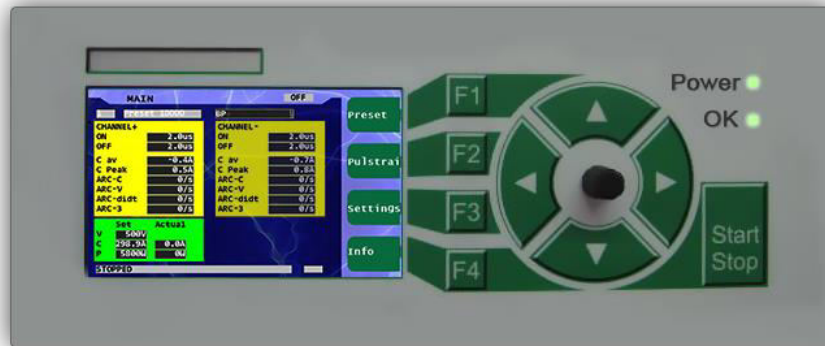
	MP2-HC 200	MP2-HC 400	MP2-HC 600	MP2-HC 1000	MP2-HC 1500
construction	19" – rack 5 HU				19"-rack 10 HU
Dimension H x W x D	222.25 x 483 x 650 mm				444.5 x 483 x 650 mm
Weight	36 kg	40 kg	60 kg	65 kg	65 kg

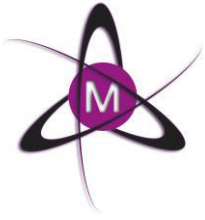




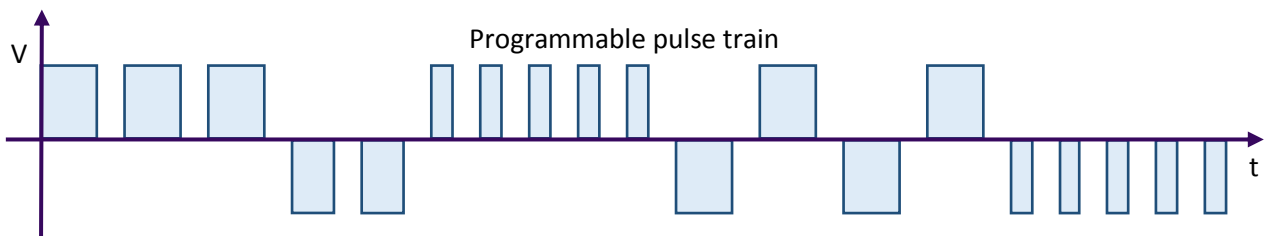
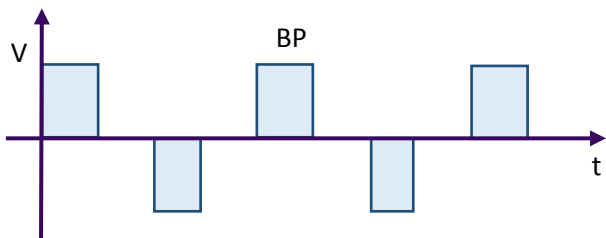
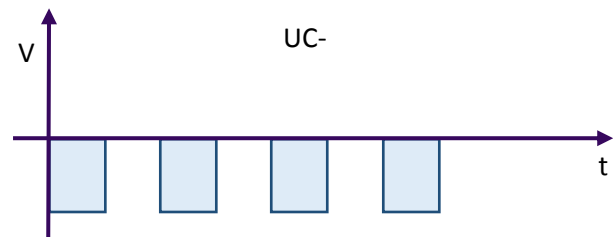
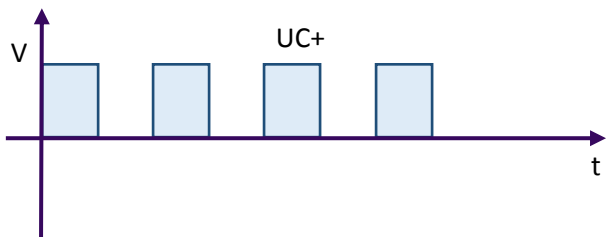
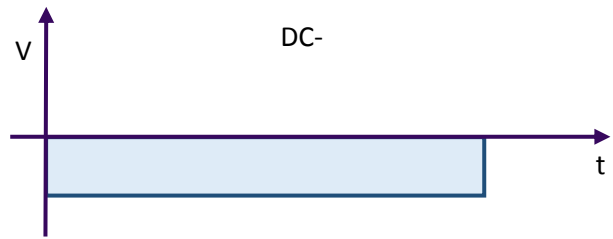
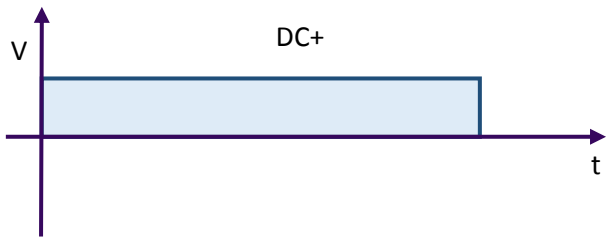
Display and Operating

	MP2-HC 200	MP2-HC 400	MP2-HC 600	MP2-HC 1000	MP2-HC 1500
Display	Graphic color Display				
LED display	Power, OK, Start/Stop				
Operating	Graphic menu via function keys and Arrow keys with knob				





6 adjustable pulse wave forms





Data sheet MP 2 –HC Bipolar HIPIMS Pulse Power Supply

Rear side with connecting cables and water connection

