Highest Flexibility

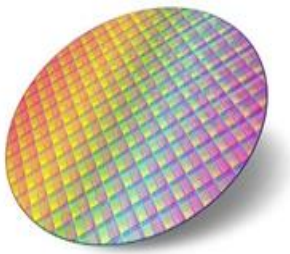
Supreme performance for Ambitious Reactive Sputtering – Production of Flat Panel Displays, Solar Cells, Decorative / Hard Coatings.

MAGPULS HIPIMS Bi-Polar Pulse Power Supply series MP2-HC are designed for operating with dual magnetrons for reactive sputtering on substrates like glass, plastic & metallic materials. Individual operating modes and enhanced ARC-management allows the MP2-HC operate effectively in achieving high quality coatings. Typical applications are production of Flat Panel Displays, Solar Cells, Decorative & Hard Coatings.

MP2-HC series comprises of mainly two units. First unit is the DC power supply which provides the DC power into the big capacitor bank of the pulse unit. Second unit is the Pulsar, an intelligent circuitry, which is equipped with highly sophisticated ARC management capability. MP2-HC series units are available with output power range from **10 kW up to 60 kW** and pulse current from **400 A up to 1500 A** peak current.

MP2-HC Duty Cycle can be adjusted individually for each half wave to achieve higher target utilisation & for better optimisation of the processes. Enhanced ARC management provides best coating results without process interruptions. Optionally, MP2-HC series provide an external Optical Input Interface for external controlling of the pulse times externally. It also has as an Optical Output Interface for triggering or synchronization of other bipolar pulse power supplies of series MP1-HC or MP2-HC.

FEATURES	*BENEFITS & ADVANTAGES*
Adjustable Pulse Parameters & Frequency	Universal Application Range - One power supply
6 Different Output operating modes	Optimal adjustment of process for better process stability
DC, Uni-Polar, Bi-Polar Pulse & Prog Pulse Train	Better control of power - optimized target utilization
Enhanced Effective ARC management	Quick Arc-suppression. Lowest Arc-energy. Best results
Independent +ve and -ve Pulse & Arc Parameters	Highly Effective results for Dual Sputtering processes



VOLTAGE PULSING – Descrete Advantage

MAGPULS' MP2-HC Pulse Generators are designed on Voltage Pulsing Technology (VPT). Unlike in Current Pulsing Technology, user can set the amplitude of the Pulse (voltage) in VPT Pulsars. This provides a very tight control on the process. Stable plasma condition is easily achievable at low pulsing frequencies, well below 100kHz. Pulsing current is in correlation with the plasma impedance & temperature stress on the coating products can be controlled very effectively.

Technical Data

OUT PUT	MP2-HC 400	MP2-HC 750	MP2-HC 1000	MP2-HC 1500
Voltage	0 – 1000 V	0 – 1000 V	0 – 1000 V	0 – 1000 V
Current	0 – 20 A DC 0 – 400 A Pulse	0 – 40 A DC 0 – 750 A Pulse	0 – 60 A DC 0 – 1000 A Pulse	0 – 120 A DC 0 – 1500 A Pulse
Power	0 – 10 kW DC	0 – 20 kW DC	0 – 30 kW DC	0 – 60 kW DC
Pulse Frequency	DC 0.05 Hz – 50 kHz	DC 0.05 Hz – 30 kHz	DC 0.05 Hz – 30 kHz	DC 0.05 Hz – 30 kHz
Max. Frequency with Max. Pulse Current	50 kHz @ 100 A 05 kHz @ 400 A	30 kHz @ 120 A 05 kHz @ 750 A	30 kHz @ 150 A 05 kHz @ 1000 A	30 kHz @ 240 A 05 kHz @ 1500 A
Pulse Time Settings T_{on+} / T_{on-} / T_{off+} / T_{off-}	5.0 µs up to 100 sec	5.0 µs up to 100 sec	5.0 µs up to 100 sec	5.0 µs up to 100 sec
Duty Cycle	0.005 % to 100 %			
Pulse wave form	DC + DC – Uni-Polar + Pulse	Uni-Polar – Pulse Bi-Polar Pulse Programmable Pulse Train		
IN PUT				
Max. Voltage	0 – 1000 V DC	0 – 1000 V DC	0 – 1000 V DC	0 – 1000 V DC
Max. Current	0 – 20 A DC	0 – 40 A DC	0 – 60 A DC	0 – 120 A DC
Max. Power	0 – 10 kW DC	0 – 20 kW DC	0 – 30 kW DC	0 – 60 kW DC
Mains Supply	1 Φ 230 V AC 50/60 Hz or 1 Φ 115 V AC 50/60 Hz			
ARC-MANAGEMENT				
I_{max} - Detection	0 A ± 400 A Peak	0 A ± 750 A Peak	0 A ± 1000 A Peak	0 A ± 1500 A Peak
ARC – Detection Time	< 200 ns	< 200 ns	< 200 ns	< 200 ns
Off Time after ARC Detection	30 µs up to 1000 ms			
ARC – Recovery Time	≥ 200 µs	≥ 200 µs	≥ 200 µs	≥ 200 µs
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. Ipeak up to 1 x max. Ipeak (Option)			
INTERFACE				
Analog	1 (up to 3) 15 pin-Sub-D for controlling external DC power supplies			
Digital	15 pin Sub-D user Interface with floating potential contactors			
RS 232	9 pin Sub_D			
Ethernet	RJ 45			
Profibus	9 pin Sub-D (Option)			
TEMP MANAGEMENT				
Cooling System	Air cooling	Water cooling		
Cooling Temperature	Max. 35°C	20°C – 30°C		
Cooling Medium	Air	Water (Max water pressure 6 bar)		

Technical Data

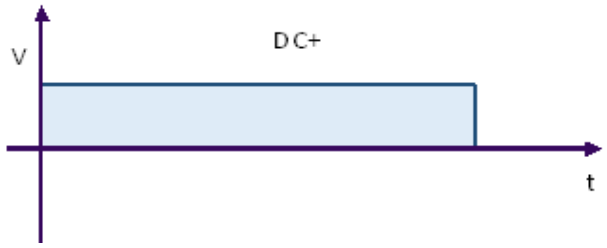
ENV CONDITION	MP2-HC 400	MP2-HC 750	MP2-HC 1000	MP2-HC 1500
Ambient Temperature	+5° C up to +35° C			
Max. Humidity	80 % non condensing			
Max. Operating Altitude	1500 m above sea level			
MECHANICAL DATA				
Construction	19" – Rack 5 HU		19" – Rack 12 HU	
Dimension H x W x D	266.7 mm x 483 mm x 650 mm		533.4 mm x 483 mm x 700 mm	
Weight	36 kg	42 kg	80 kg	85 kg
DISPLAY & CONTROLS				
Display	Graphic color Display			
LED Display	Power, OK, Start / Stop			
Controls	Graphical Menu via Function Keys, Arrow keys & Continuous Rotating Knob			

BP Symmetric & BP Asymmetric

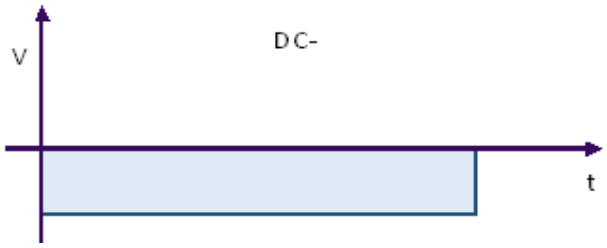
MP2-HC HIPIMS Pulse Generators are available in 2 variants : Bi-Polar Symmetric (MP2-HC-S) & Bi-Polar Asymmetric (MP2-HC-AS). In Symmetric variant , +ve and -ve Pulses will have the same Pulse Voltage settings, whereas in Asymmetric variant, user can set different values for Pulse Voltage outputs. This gives the user higher control and advantage in the Dual Magnetroc Sputteirng processes.

OUT PUT Wave Forms

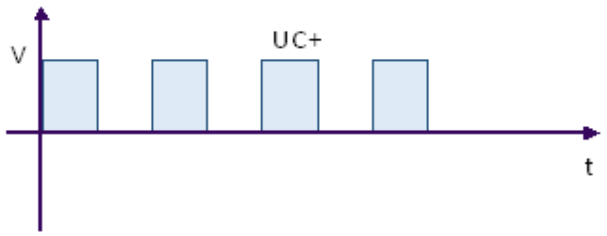
DC + Output



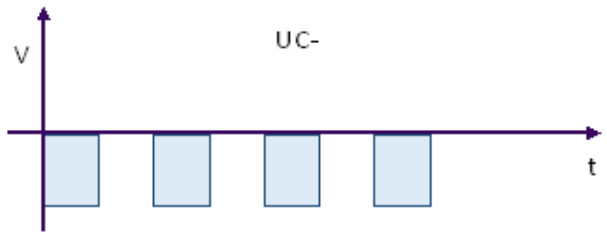
DC - OutPut



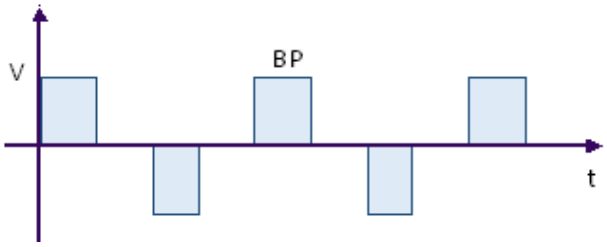
Uni-Polar + Pulse Output



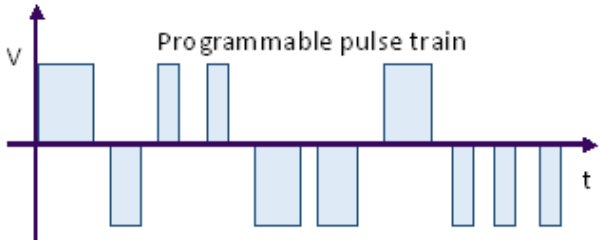
Uni-Polar - Pulse OutPut



Bi-Polar Pulse Output



Programmable Pulse Train OutPut

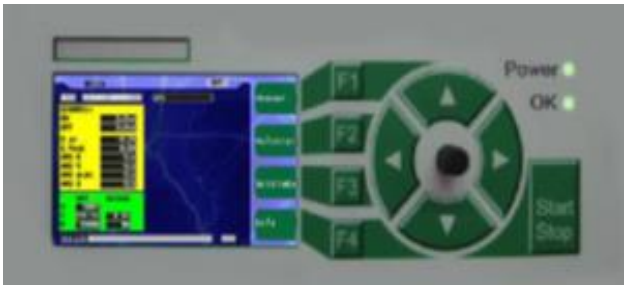


PRODUCT Images

Front Facia with DC power supply

Rear side with connecting cables

Control Panel



LCD Display Panel

Magpuls Stromversorgungs Systeme GmbH

Im Unterfeld 19, 76547 Sinzheim,
Deutschland. Germany
Ph : +49 7221 987 850 | Em : info@magpuls.net

www.magpuls.de