



# MAGPULS MP 2 - HC BIPOLAR HiPIMS Pulse Power Supply



## 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 to operate effectively in achieving high quality coatings. Typical applications are production of Flat Panel Displays, Solar Cells, Decorative & Hard Coatings.

units are available with an output power range from 10 kW up to 60 kW and pulse current from 400 A up to 1500 A peak current.

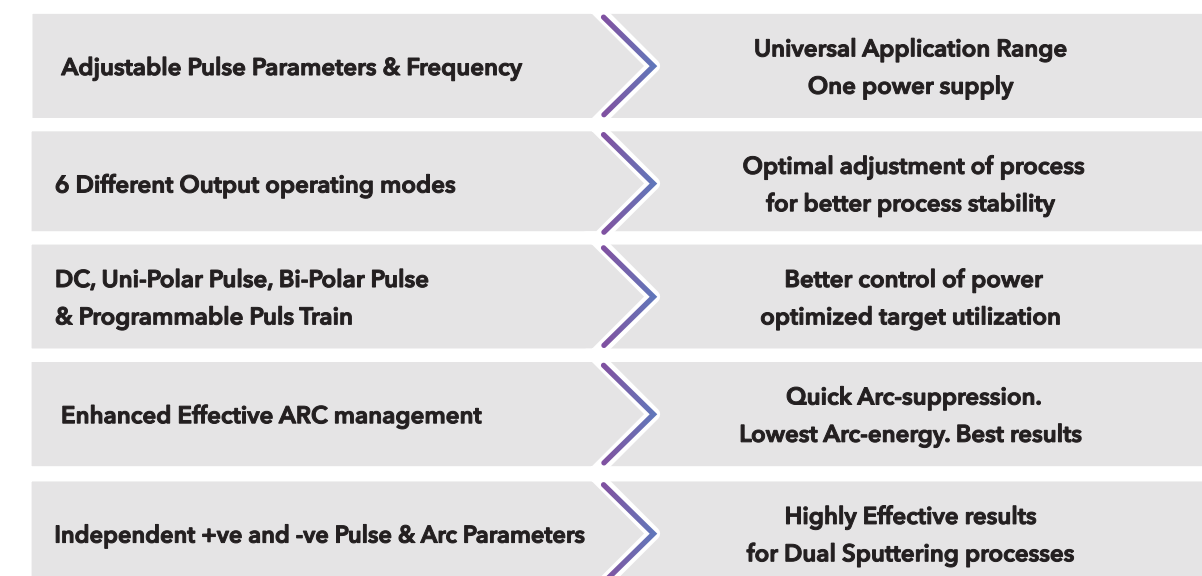
MP2-HC Duty Cycle can be adjusted individually for each half-wave to achieve higher target utilisation & for better optimisation of the processes. Enhanced ARC management provides best coating results without process interruptions. Optionally, MP2-HC series provide an external Optical Input Interface 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.

MP2-HC series consists of mainly two units. The first unit is the DC power supply, which provides the DC power into the big capacitor bank of the pulse unit. The second unit is the Pulsar, an intelligent circuitry, which is equipped with highly sophisticated ARC management capability. MP2-HC series

### VOLTAGE PULSING - Discrete Advantage

MAGPULS MP2-HC Pulse Generators are designed on Voltage Pulsing Technology (VPT). Unlike in Current Pulsing Technology, users 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.

### Features and Benefits



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World Wide Sales & Support through Dynamic Partners



	MP2-HC 400	MP2-HC 750	MP2-HC 1000	MP2-HC 1500
<b>OUT PUT</b>				
Voltage	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		
Max. Frequency with Max. Pulse Current	50 kHz at 100 A 5 kHz at 400 A	30 kHz at 120 A 5 kHz at 750 A	30 kHz at 150 A 5 kHz at 1000 A	30 kHz at 240 A 5 kHz at 1500 A
Pulse Time Settings TON+ / TON- / TOFF+ / TOFF-	5.0 μs up to 100 sec			
Duty Cycle	0.005 % to 100 %			
Pulse wave form	DC+ Unipolar pulse Programmable Pulse Train			
<b>IN PUT</b>				
Max. Voltage	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			
<b>ARC-MANAGEMENT</b>				
I <sub>max</sub> -Detection	0 ± 400 A peak	0 ± 750 A peak	0 ± 1000 A peak	0 ± 1500 A peak
ARC-Detection Time	< 200 ns			
Off Time after ARC-Detection	30 μs up to 1000 ms			
ARC-Recovery Time	≥ 200 μs			
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 <sub>bc</sub> (Option)			
U x I - Cross Detection	Var. U threshold: 0 V up to 1000 V Var. I threshold: 0.1 x max. I <sub>peak</sub> up to 1 x max I <sub>peak</sub> (Option)			
<b>INTERFACE</b>				
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)			
<b>TEMP MANAGEMENT</b>				
Cooling System	Air cooling	Water cooling (max. water pressure 6 bar)		
Cooling Temperatur	Max. 35°C	20°C - 30°C		



	MP2-HC 400	MP2-HC 750	MP2-HC 1000	MP2-HC 1500
<b>ENV CONDITION</b>				
Ambient Temperature	+ 5 °C up to + 35 °C			
Max. Humidity	80 % non condensing			
Max. Operation Altitude	1500 m above sea level			
<b>MECHANICAL DATA</b>				
Construction	19"-Rack 5 HU		19"-Rack 12 HU	
Dimensions H x W x D	266.7.25 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
<b>DISPLAY &amp; CONTROLS</b>				
Display	Graphic color display			
LED Display	Power, OK, Start / Stop			
Controls	Graphical menu via function keys, arrow keys and continuous rotating knob			
<b>SUITABILITY</b>				
Application	Hard Coating on Tools & Bits and BIAS application			
Process	PVD, Plasma Nitriding, Pulse Plasma, Reactive Sputtering, Dual & Single Magnetron Sputtering			
Material	Metals			

Please contact us for information on higher capacity models & other variants

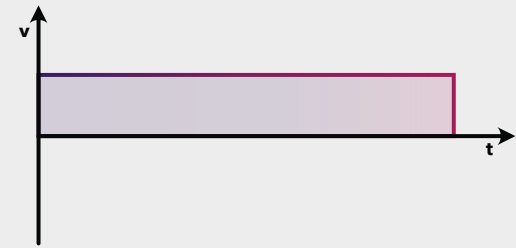
**BP Symmetric & BP Asymmetric**

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, users can set different values for Pulse Voltage outputs. This gives the user higher control and advantage in the Dual Magnetron Sputtering processes

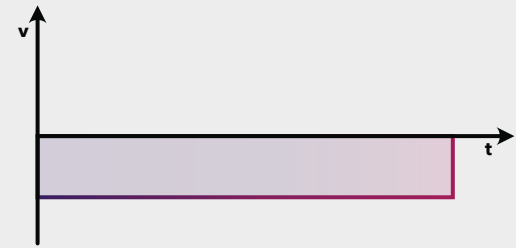


### OUT PUT Waveforms

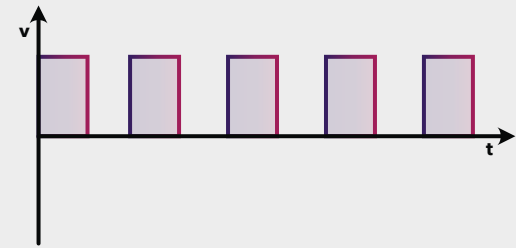
DC+ Output



DC- Output



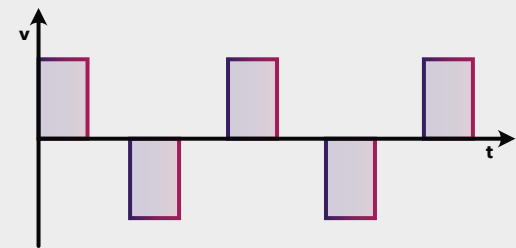
Uni-polar+ Pulse Output



Uni-Polar- Pulse Output



Bi-Polar Pulse Output



Programmable Pulse Train Output

