



# MAGPULS MP 2 - AS Asymmetric BIPOLAR Pulse Power Supply



## Highest flexibility

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

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

management capability. MP2 series units are available with an output power range from 3 kW up to 60 kW and pulse current from 35 A up to 400 A peak current.

MP2 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 series provides 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 or MP2.

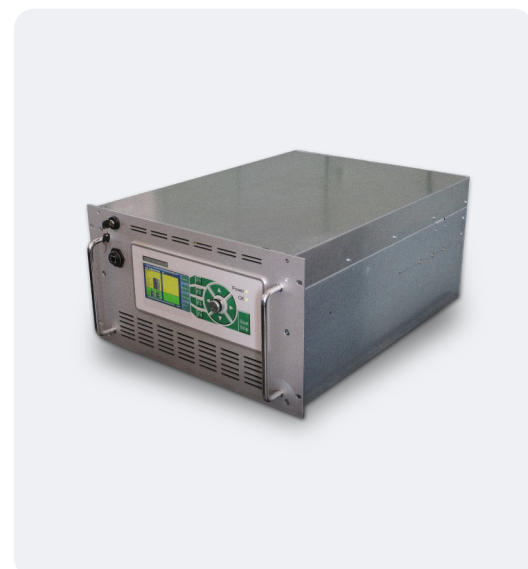
MP2 series consists of mainly two units. The first unit is the DC power supply, which provides DC power into the big capacitor bank of the pulse unit. The second unit is the Pulsar, an intelligent circuitry, which is equipped with highly sophisticated ARC

### VOLTAGE PULSING - Discrete Advantage

MAGPULS MP2 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

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 Pulse, Bi-Polar Pulse & Programmable Puls 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 Different adjustable voltage amplitude for positive and negative pulse	Highly Effective results for Dual Sputtering processes



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World Wide Sales & Support through Dynamic Partners



	MP2-35 AS	MP2-100 AS	MP2-200 AS	MP2-400 AS
<b>OUT PUT</b>				
Voltage	0 - 1000 V			
Current	0 - 5.3 A DC 0 - 35 A Pulse	0 - 38 A DC 0 - 100 A Pulse	0 - 50 A DC 0 - 200 A Pulse	0 - 120 A DC 0 - 400 A Pulse
Power	2x 0 - 3 kW DC	2x 0 - 15 kW DC	2x 0 - 30 kW DC	2x 0 - 60 kW DC
Pulse Frequency	DC or 0.05 Hz - 50 kHz			
Max. Frequency with Max. Pulse Current	100 kHz at 10 A 25 kHz at 35 A	100 kHz at 25 A 20 kHz at 100 A	100 kHz at 50 A 20 kHz at 200 A	100 kHz at 80 A 20 kHz at 400 A
Pulse Time Settings T <sub>ON+</sub> / T <sub>ON-</sub> / T <sub>OFF+</sub> / T <sub>OFF-</sub>	2.0 μs up to 100 sec			
Duty Cycle	0.005 % to 100 %			
Pulse wave form	DC+, DC- Unipolar+ pulse, Unipolar- pulse Programmable Pulse Train			
<b>IN PUT</b>				
Max. Voltage	2x 0 - 1000 V DC			
Max. Current	2x 0 - 5.3 A DC	2x 0 - 38 A DC	2x 0 - 50 A DC	2x 0 - 120 A DC
Max. Power	2x 0 - 3 kW DC	2x 0 - 15 kW DC	2x 0 - 30 kW DC	2x 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 to ±35 A peak	0 to ±100 A peak	0 to ±200 A peak	0 to ±400 A peak
ARC-Detection Time	< 200 ns			
Off Time after ARC-Detection	30 μs up to 1000 ms			
ARC-Recovery Time	≥ 100 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>DC</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		



	MP2-35 AS	MP2-100 AS	MP2-200 AS	MP2-400 AS
<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 6 HU
Dimensions H x W x D	222.25 mm x 483 mm x 650 mm			266.7 mm x 483 mm x 650 mm
Weight	25 kg	32 kg	36 kg	65 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

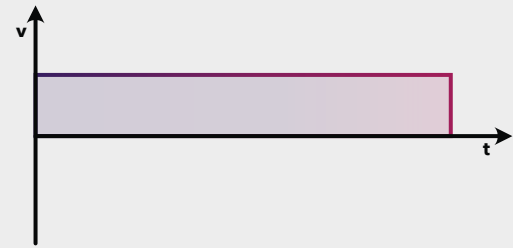
**BP Symmetric & BP Asymmetric**

MP2 Pulse Generators are available in 2 variants : Bi-Polar Symmetric (MP2-S) & Bi-Polar Asymmetric (MP2-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.

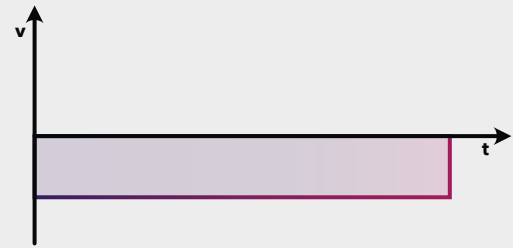


### OUT PUT Waveforms

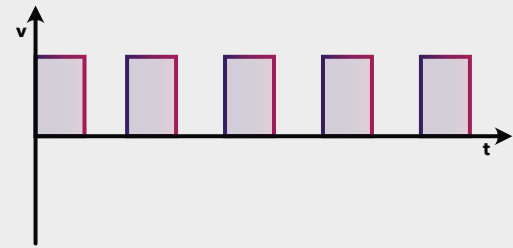
DC+ Output



DC- Output



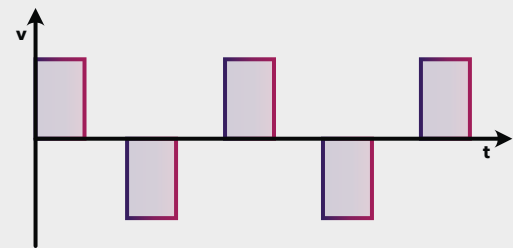
Uni-polar+ Pulse Output



Uni-Polar- Pulse Output



Bi-Polar Pulse Output



Programmable Pulse Train Output

