



Highest Flexibility

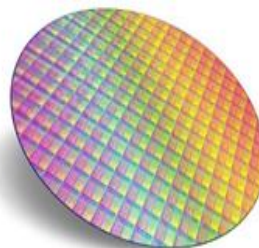
Supreme performance for Ambitious Reactive Sputtering – Production of Flat Panel Displays, Solar Cells, Decorative / Hard Coatings.

Asymmetric Bipolar HIPIMS Pulse Power Supply series MP2-HC-AS are designed for operating with dual magnetrons for reactive HIPIMS sputtering on substrates like glass, plastic & metal & semiconductors. Individual operating modes and enhanced ARC-management allows MP2-HC-AS Pulse Power Supplies operate very effectively in achieving highest quality coatings. Typical applications are production of optical layers, Semiconductor industry, Solar Cells, Decorative & Hard Coatings, metallization on plastic substrates, medical technology (Implants).

MP2-HC-AS series comprises of mainly two units. First units are two separate DC power supplies which provides DC power into the big capacitor bank of the pulse unit separated for the positive and the negative output Voltage. Second unit is the Pulsar, an intelligent circuitry, which is equipped with highly sophisticated ARC management capability. MP2-HC-AS series units are available with output power range from **2 kW up to 60 kW** and pulse current from **500 A up to 1500 A** peak current.

MP2-HC-AS Duty Cycle can be adjusted individually for each half wave to achieve higher target utilization & for better optimization of the processes. Enhanced ARC management provides best coating results without process interruptions. Optionally, MP2-HC-AS 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 or MP2.

FEATURES	BENEFITS & ADVANTAGES
Adjustable Pulse Parameters & Frequency	Universal Application Range - One power supply
8 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
Different adjustable voltage amplitude for positive and	





VOLTAGE PULSING – Discrete Advantage

MAGPULS' MP2-HC-AS 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	MP2-500 HC-AS	MP2-750 HC-AS	MP2-1000 HC AS	MP2-1500 HC-AS
Voltage	0 – 1000 V	0 – 1000 V	0 – 1000 V	0 – 1000 V
Current	0 – 20 A DC 0 – 500 A Pulse	0 – 30 A DC 0 – 750 A Pulse	0 – 30 A DC 0 – 1000 A Pulse	0 – 50 A DC 0 – 1500 A Pulse
Power	2x 0 – 10 kW DC	2x 0 – 10 kW DC	2x 0 – 15 kW DC	2x 0 – 20 kW DC
Pulse Frequency	DC / 0.05 Hz – 75 kHz		DC / 0.05 Hz – 50 kHz	
Max. Frequency with Max. Pulse Current	75 kHz @ 10 A 4 kHz @ 500 A	75 kHz @ 25 A 4 kHz @ 750 A	50 kHz @ 50 A 4 kHz @ 1000 A	50 kHz @ 80 A 4 kHz @ 1500 A
Pulse Time Settings T _{on+} / T _{on-} / T _{off+} / T _{off-}	2.0 µs up to 100 sec	2.0 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	Asymmetric Bipolar	
IN PUT				
Max. Voltage	2x 0 – 1000 V DC	2x 0 – 1000 V DC	2x 0 – 1000 V DC	2x 0 – 1000 V DC
Max. Current	2x 0 – 5.3 A DC	2x 0 – 38 A DC	2x 0 – 30 A DC	2x 0 – 40 A DC
Max. Power	2x 0 – 3 kW DC	2x 0 – 15 kW DC	2x 0 – 15kW DC	2x 0 – 20 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 to ± 500 A peak	0 to ± 750 A peak	0 to ± 1000 A peak	0 to ± 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	≥ 100 µs	≥ 100 µs	≥ 100 µs	≥ 100 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. I _{peak} up to 1 x max. I _{peak} (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)		
ENV CONDITION				
Ambient Temperature	+5° C up to +35° C			
Max. Humidity	80 % non condensing			
Max. Operating Altitude	1500 m above sea level			

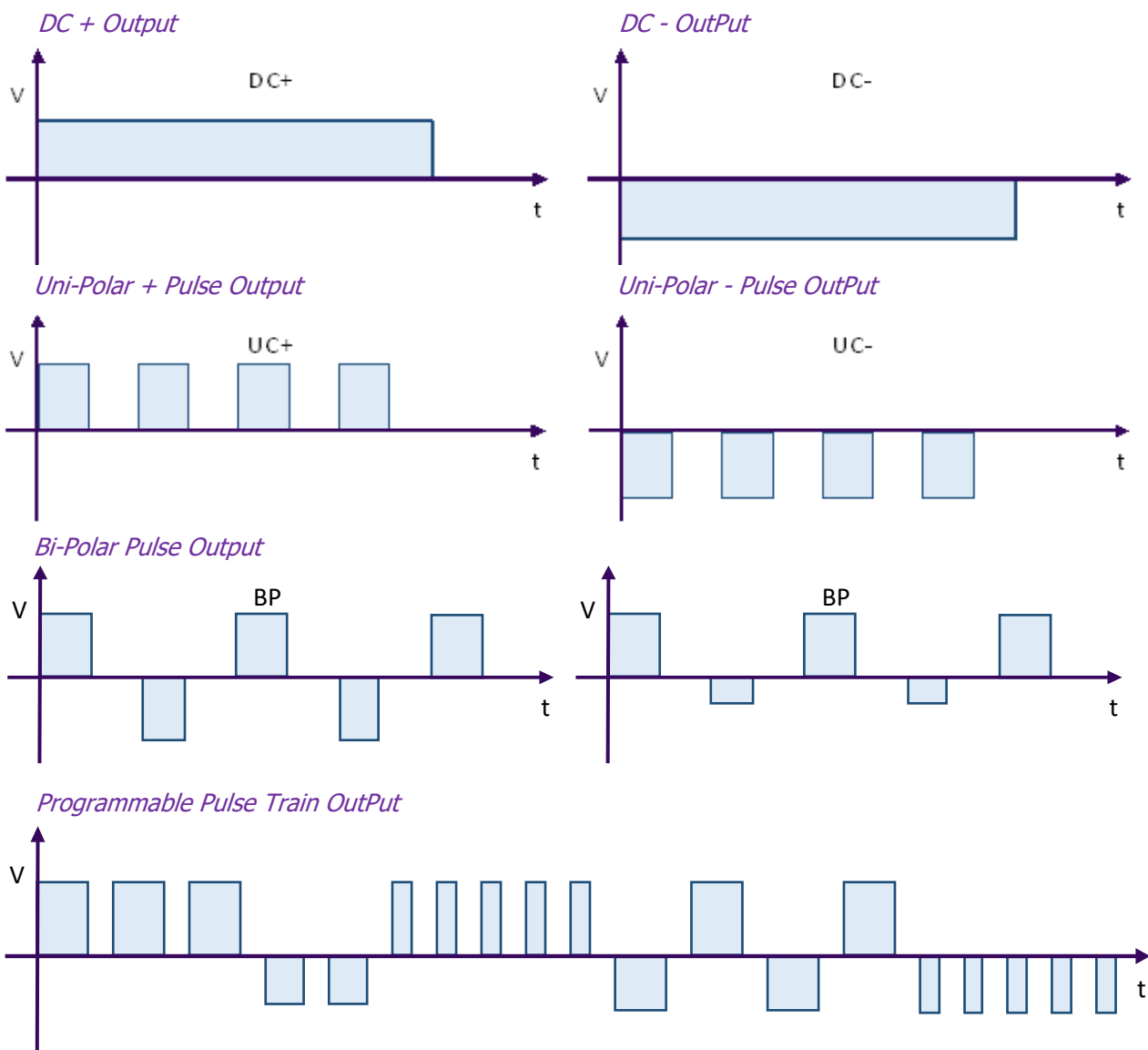


MECHANICAL DATA	MP2-500 HC-AS	MP2-750 HC-AS	MP2-1000 HC-AS	MP2-1500 HC-AS
Construction	19" – rack 6 HU		19" – rack 12 HU	
Dimension H x W x D	266.7 mm x 483 mm x 650 mm		533,4 mm x 483 mm x 700 mm	
Weight	50 kg	55 kg	85 kg	95 kg
DISPLAY & CONTROLS				
Display	Graphic color Display			
LED Display	Power, OK, Start / Stop			
Controls	Graphical Menu via Function Keys, Arrow keys & Continuous Rotating Knob			

BP Symmetric & BP Asymmetric

MP2 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, user can set different values for Pulse Voltage outputs. This gives the user higher control and advantage in the Dual Magnetron Sputtering processes.

OUTPUT Wave Forms





MP2-HC-AS Pulse Power Supply

Asymmetric BI-POLAR

PRODUCT Images

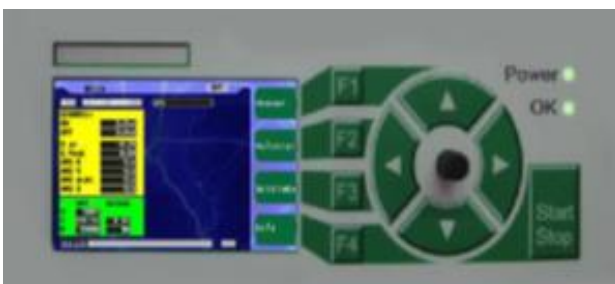
Front Facia with DC power supply



Rear side with connecting cables



Control Panel



LCD Display Panel



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