

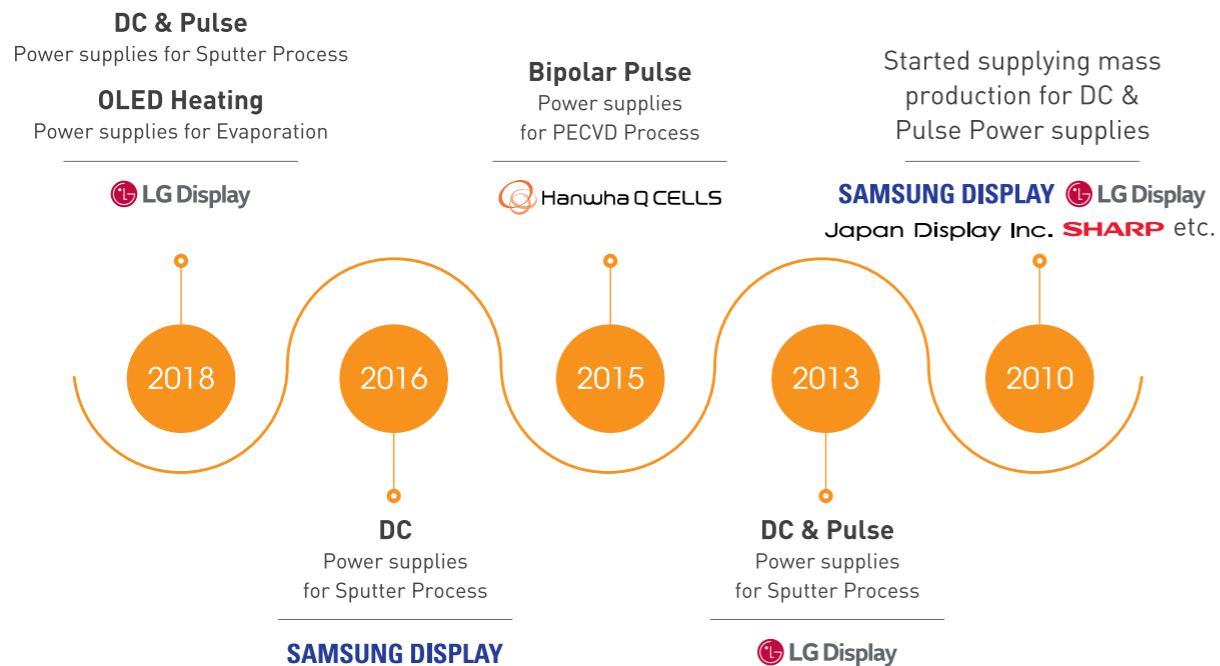
DC & PULSE Power Supplies for Plasma Process

- DC & PULSE Sputtering
- Atmospheric Pressure Plasma
- Arc Ion Plating
- Cleaning & Bias
- Ion Beam
- OLED Heating

With solid and proven product portfolio, EN Technologies Inc. offers market-leading power generation solutions and services for various applications

We are the preferred provider of power supplies across Asia. With our accumulated experiences in extensive local applications and engineering support, we thrive to fulfill our customers' needs with robust, reliable, and specialized products and services.

Delivery Record for Mass Production



Applications

TOP GLASS

AR(Anti-Reflection)
AF(Anti-Fingerprint)
Surface Treatment

- DC : EnerStream
- Pulsed DC : EnerPulse
- ETC : Genius, Forte I-302

TOUCH PANEL

ITO & Metal Sputter
Reactive Sputter

- Pulsed DC : EnerPulse
- DC : EnerStream
- Bipolar Pulsed DC : EnerPulseDuo

OLED, TFT-LCD, Oxide TFT

ITO & Metal Sputter
Organic & Metal Heating

- Pulsed DC : EnerPulse
- DC : EnerStream
- DC for OLED Heating : EnerFlex, Neos

CASE

EMI Coating
Multi Coating for color

- Pulsed DC : EnerPulse
- DC : EnerStream
- Bipolar Pulsed DC : EnerPulseDuo



OLED, Flexible Touch Panel, Optical Lens, ITO Glass, Automotive Wheels & Headlamps, DLC Coating Parts, TiN Coating, CIGS Solar Cell

Features

Excellent Arc Control System



Arc Energy Less than 0.2mJ/kW

To minimize arc effect, EN Technologies' arc suppression technology applies reverse voltage within 200ns and drops current value to 0 within 2.5µs at arcing to enable users to create thin film and yield

High Performance



Apply Stable Topology with Drooping Characteristics

Generate stable plasma at ignition. Allow fast detection and stable output control at arcing. Enable users to control constant power, constant current, and constant voltage

Wide Operating Range



Wide Operating Range

Wide range of operating power curve is applied to high voltage and high current

Interface



User-friendly Interface

Various interfaces such as Analog/Digital input/output, RS-232/485, Fieldbus, and Ethernet allow users to integrate systems easily

Parallel Operation



High-capacity

Maximum of 12 units (1 Master+11 Slave) can operate in parallel

Worldwide Sales & Service Support

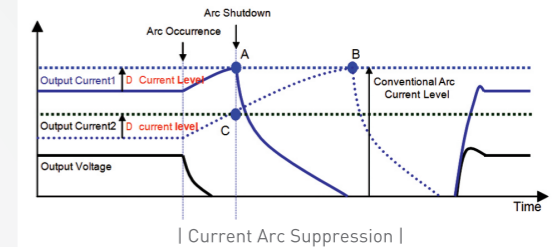
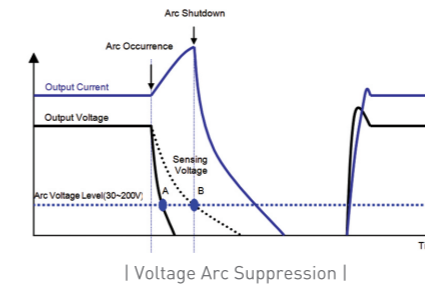


24-hour Customer Service

We can immediately assist our customers with optimized solutions 24 hours a day, 7 days a week

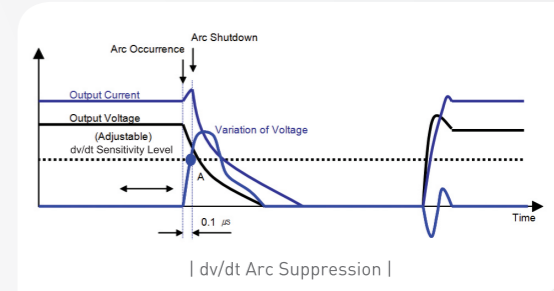
Arc Management

Arc Detection Method

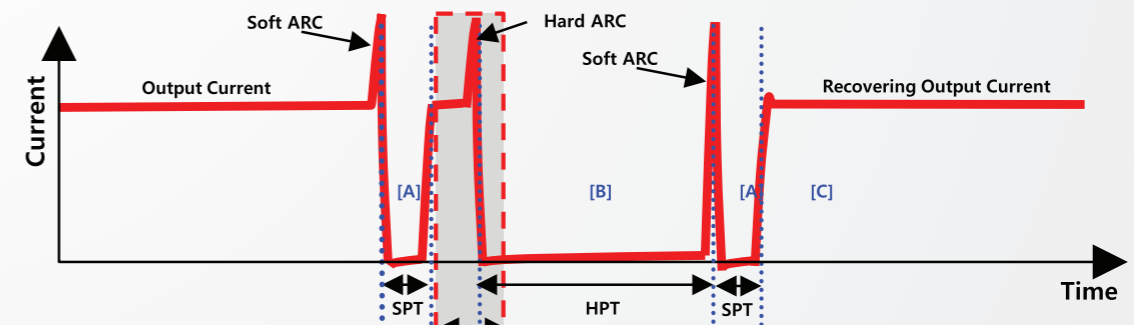


Less than 0.2mJ/kW arc energy is obtained to minimize the damages caused by arc during sputtering process

- Adopt topology to minimize the capacitance and inductance of internal energy storage
- Apply reverse voltage within 200ns at arcing
- Current value drops to 0 within 2.5µs
- Stable absorption the inductance energy of output cable



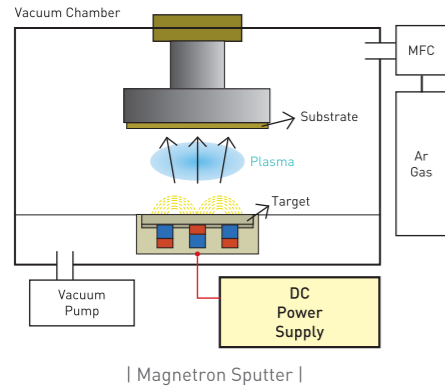
Arc Sequence



- SPT – Soft Pause Time
- HPT – Hard Pause Time

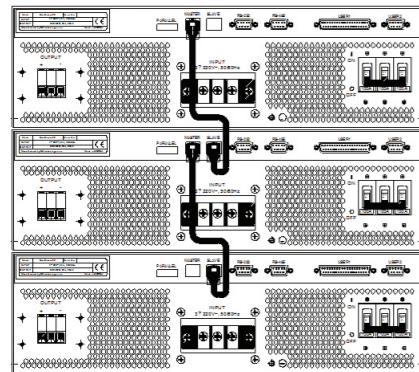
Hard ARC recognizing range (about 150us)

DC Power Supplies for Magnetron Sputter



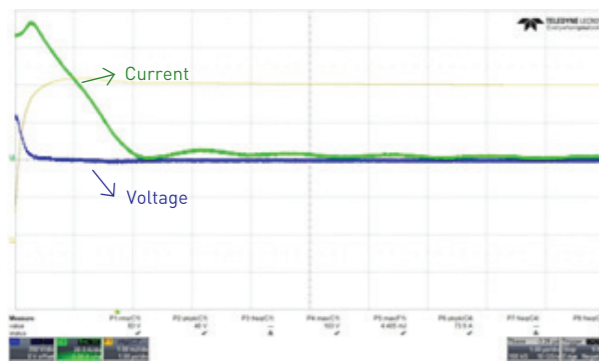
Applications

- Semiconductor wafer sputtering
- TFT LCD
- OLED LTPS sputter metal & TCO deposition
- Thin film for solar cells
- Mobile phone cases
- ITO deposition for touch panels
- Automotive wheels and headlamps
- Ion nitriding
- BIPV, data storage, FCCL



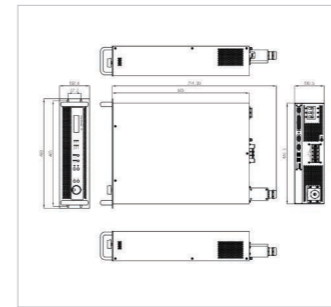
Parallel Operation

- Maximum parallel operation of 12EA (Master 1EA+Slave 11EA)
- Maximum output of 480kW (EnerStream 60: maximum parallel operation of 8EA)

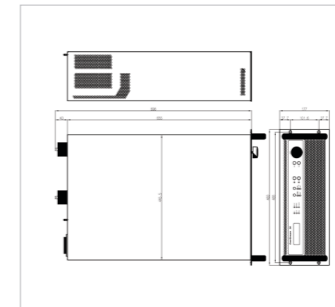


Product Specifications

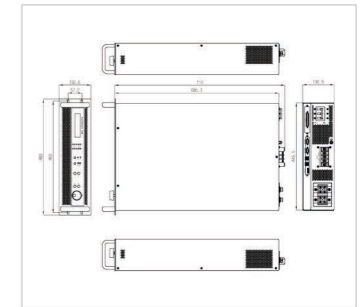
EnerStream®



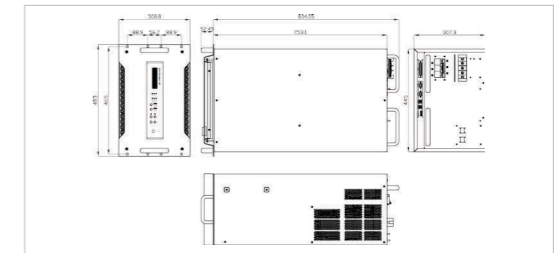
| EnerStream 5/10/20 |



| EnerStream 30 |



| EnerStream 5/10D |



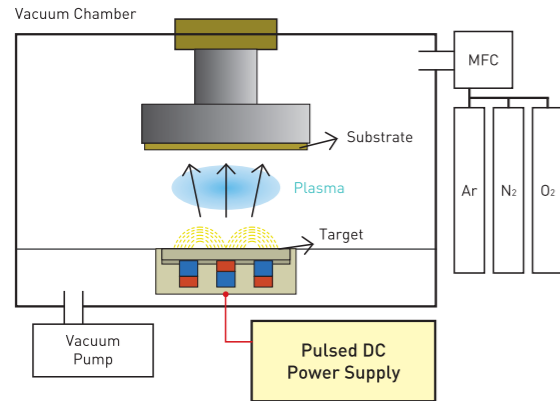
| EnerStream 60 |

Items	Specifications									
	DC (1Ch)								DC (2Ch)	
	EnerStream 5	EnerStream 10	EnerStream 10H	EnerStream 20	EnerStream 20H	EnerStream 30	EnerStream 30H	EnerStream 60	EnerStream 5D	EnerStream 10D
Input	3Ø 208V/220V/380V	3Ø 208V/220V/380V	3Ø 208V/220V/380V	3Ø 220V/380V	3Ø 220V/380V	3Ø 380V/440V	3Ø 440V	3Ø 440V	3Ø 380V	3Ø 380V
Ignition Voltage	1500V	1500V	1500V	1500V	1500V	1500V	1500V	1500V	1500V	1500V
Output	800V, 6.25A / 400V, 12.5A	800V, 12.5A / 400V, 25A	1000V, 10A / 500V, 20A	800V, 25A / 400V, 50A	1000V, 20A / 500V, 40A	800V, 37.5A / 400V, 75A	1200V, 25A / 545V, 55A	900V, 66.6A / 400V, 150A	800V, 6.25A / 400V, 12.5A	800V, 12.5A / 400V, 25A
Output Power	DC 5kW	DC 10kW	DC 10kW	DC 20kW	DC 20kW	DC 30kW	DC 30kW	DC 60kW	DC 5kW+5kW	DC 10kW+10kW
Arc Energy	Less than 0.5mJ/kW							Less than 0.2mJ/kW	Less than 0.5mJ/kW	
Interface	RS-232 / RS-485 (Option : DeviceNet, ProfiBus)									
Size[mm]	133(H)x483(W) x605(D)	133(H)x483(W) x605(D)	133(H)x483(W) x605(D)	133(H)x483(W) x605(D)	133(H)x483(W) x605(D)	177(H)x483(W) x655(D)	177(H)x483(W) x655(D)	309(H)x483(W) x783(D)	133(H)x483(W) x655(D)	133(H)x483(W) x655(D)
Weight[kg]	24.5	24.5	24.5	30.5	30.5	38.8	38.8	80	32	32
Cooling	Air-Cooled									

※ Cable Duct + 129mm

※ Specifications subject to change without notice

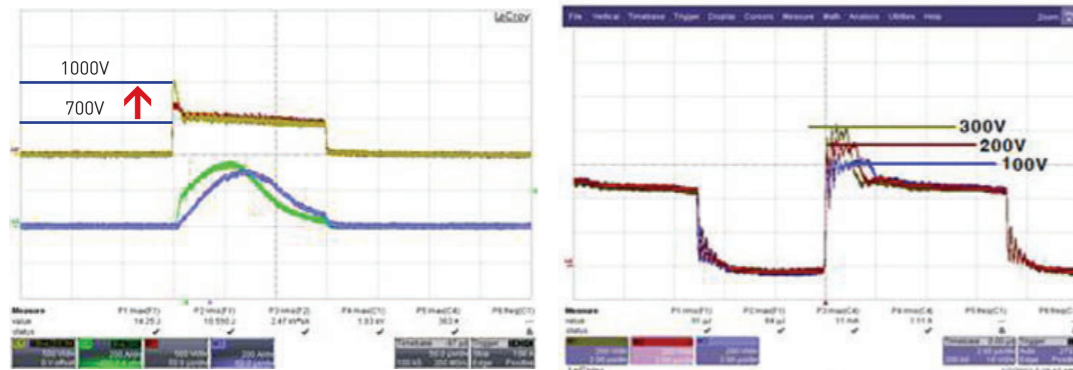
Pulsed DC Power Supplies for Single Magnetron Sputtering



Applications

- Semiconductor wafer sputtering
- Oxide TFT LCD & Color filter
- OLED LTPS sputter metal & TCO deposition
- Thin film for solar cells
- Mobile phone cases
- ITO deposition for touch panels
- Automotive wheels and headlamps
- Ion nitriding
- BIPV, data storage, FCCL

Pulsed DC waveform to maximize ionization

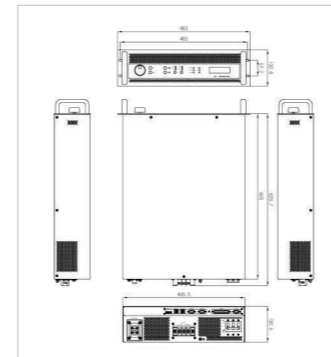


Benefits

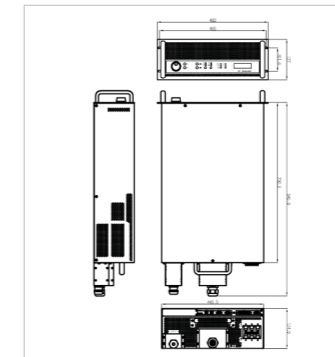
- Rapid increase of current induced by change in reignition voltage : 700V → 1000V
- Adjustable reignition voltage : 50 - 300V

Product Specifications

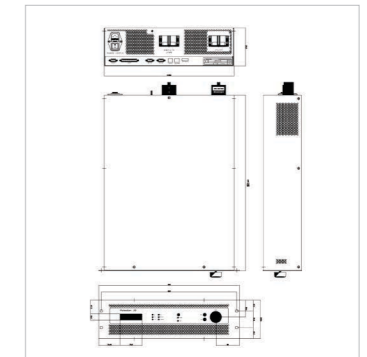
EnerPulse®



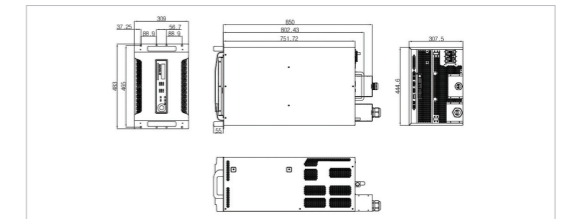
| EnerPulse 5/10/10LV/10M |



| EnerPulse 20 |



| PulseGen 20/30/40 |



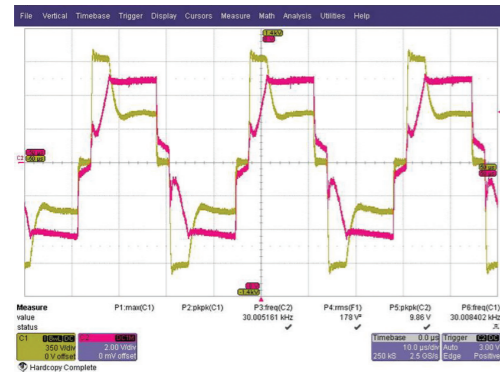
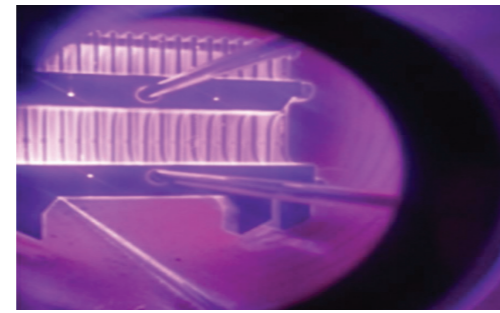
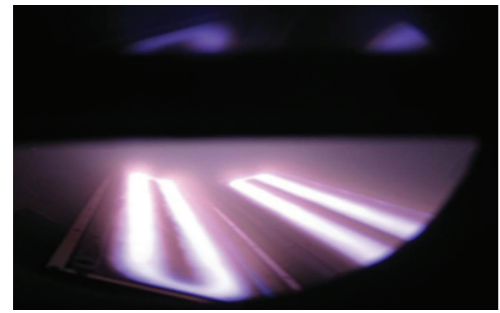
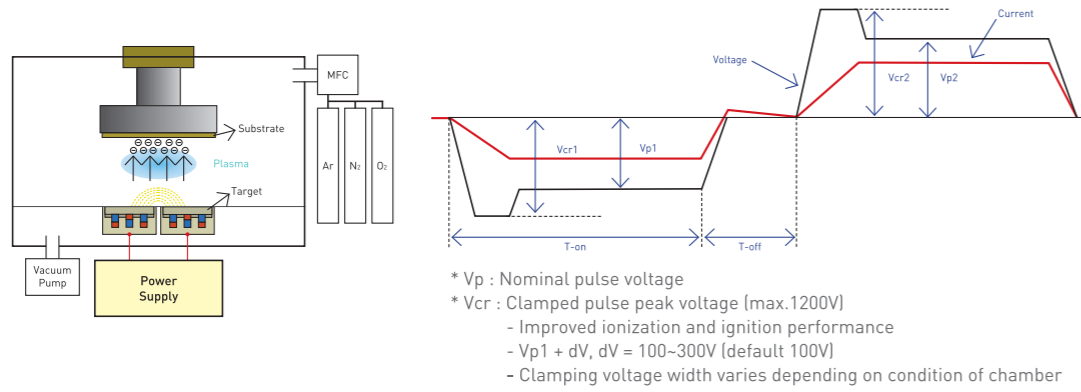
| EnerPulse 30 |

Items	Specifications										
	Reverse Voltage Fixed				Reverse Voltage Adjustable				Reverse Voltage Fixed		
	EnerPulse 5	EnerPulse 10	EnerPulse 10LV	EnerPulse 10M	EnerPulse 20	EnerPulse 15N	EnerPulse 20N	EnerPulse 30	Pulse 20 [ES20+PG20]	Pulse 30 [ES30+PG30]	Pulse 40 [2xES20+PG40]
Input	3Ø 208V/220V/380V	3Ø 208V/220V/380V	3Ø 380V	3Ø 380V	3Ø 220V/380V/440V	3Ø 400V	3Ø 220V/440V	3Ø 208V/440V	220V/380V	3Ø 380V/440V	3Ø 220V/380V
Ignition Voltage	1500V	1500V	1500V	1500V	1200V	1200V	1200V	1200V	1500V	1500V	1500V
Output	800V, 6.25A / 400V, 12.5A	800V, 12.5A / 400V, 25A	650V, 15.4A / 300V, 33.3A	800V, 12.5A / 400V, 25A	650V, 30A / 400V, 50A	1000V, 15A / 500V, 30A	900V, 22.2A / 400V, 40A	900V, 33.3A / 400V, 75A	800V, 25A / 400V, 50A	800V, 37.5A / 400V, 100A	800V, 50A / 400V, 100A
Output Power	Unipolar Pulse 5kW	Unipolar Pulse 10kW	Unipolar Pulse 10kW	Unipolar Pulse 10kW	Unipolar Pulse 20kW	Unipolar Pulse 15kW	Unipolar Pulse 20kW	Unipolar Pulse 30kW	Unipolar Pulse 20kW	Unipolar Pulse 30kW	Unipolar Pulse 40kW
Output Frequency	20 - 150 kHz			5-350kHz	20 - 100 kHz	20 - 350 kHz	20 - 150 kHz		40 - 100 kHz		40 - 80 kHz
Reverse Time	DC mode, 1.0us-10us				DC mode, 1.0us-5us	DC mode, 1.0us-8us			DC mode, 1.0us-5us		
Arc Energy	Less than 1mJ/kW				Less than 0.5mJ/kW			Less than 1mJ/kW			
Interface	RS-232 / RS-485 (Option : DeviceNet, ProfiBus)										
Size[mm]	133(H)x483(W)x605(D)	133(H)x483(W)x605(D)	133(H)x483(W)x605(D)	133(H)x483(W)x605(D)	177(H)x483(W)x700(D)	177(H)x483(W)x782(D)	221.25(H)x483(W)x700(D)	309(H)x483(W)x782(D)	133(H)x483(W)x605(D)_PG	133(H)x483(W)x605(D)_PG	133(H)x483(W)x605(D)_PG
Weight[kg]	29.5	29.5	29.5	29.5	40	42	50	73	28	32	32
Cooling	Air-Cooled										

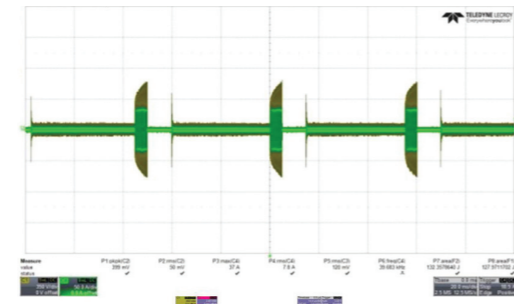
※ Cable Duct + 129mm

※ Specifications subject to change without notice

Bipolar Pulsed DC Power Supplies for Dual Magnetron Sputtering & PECVD

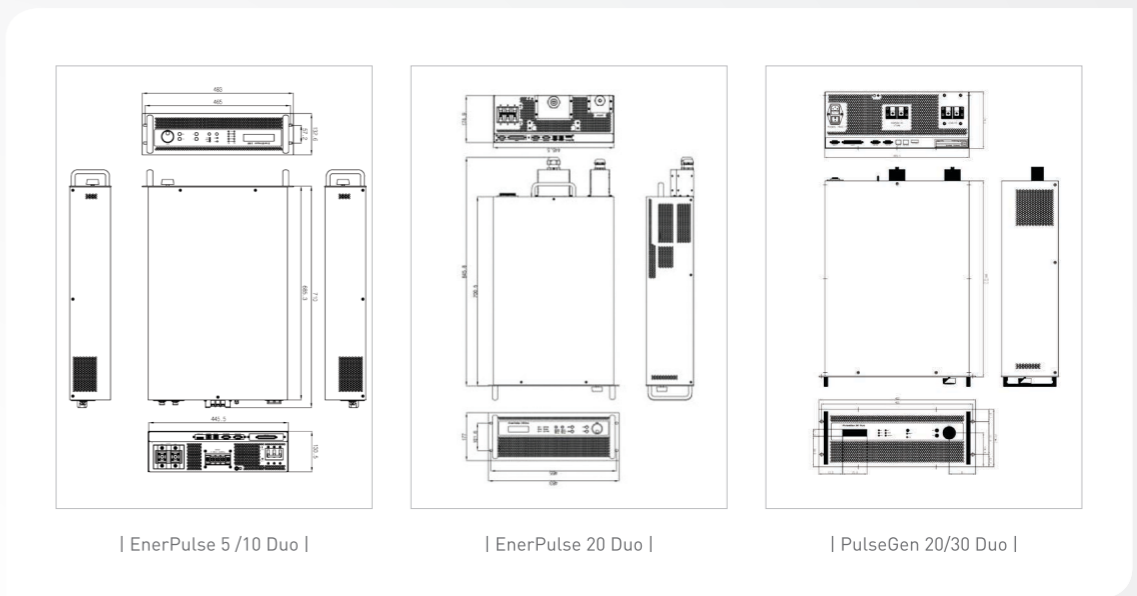


| Dual Magnetron Sputter |



| PECVD |

Product Specifications EnerPulse Duo™



Items	Specifications						
	EnerPulse 5 Duo	EnerPulse 10 Duo	EnerPulse 20 Duo	EnerPulse 40 Duo	DMS 20 (ES20+PG20Duo)	DMS 30 (ES30+PG30Duo)	DMS 60 (ES60+PG60Duo)
Input	3Ø 380V	3Ø 380V	3Ø 440V	3Ø 440V	3Ø 220V/380V	3Ø 380V/440V	3Ø 208V/220V/380V/440V
Output	800V, 6.25A / 400V, 12.5A	800V, 12.5A / 400V, 25A	600V, 33.3A / 400V, 50A	1000V, 40A / 500V, 80A	800V, 25A / 400V, 50A	800V, 37.5A / 400V, 75A	1000V, 60A / 500V, 120A
Output Power	Bipolar Pulse 5kW	Bipolar Pulse 10kW	Bipolar Pulse 20kW	Bipolar Pulse 40kW	Bipolar Pulse 20kW	Bipolar Pulse 30kW	Bipolar Pulse 60kW
Output Frequency	20 ~ 50 kHz		20 ~ 40kHz	20 ~ 100kHz	20 ~ 40 kHz		20 ~ 100kHz
Arc Energy	Less than 1mJ/kW			Less than 0.5mJ/kW	Less than 3mJ/kW		Less than 0.5mJ/kW
Interface	RS-232 / RS-485 (Option : DeviceNet, ProfiBus)						
Size[mm]	133(H)x483(W) x605(D)	133(H)x483(W) x605(D)	77(H)x483(W) x700(D)	222(H)x483(W) x750(D)	177(H)x483(W) x605(D)_PGD	177(H)x483(W) x605(D)_PGD	222(H)x483(W) x750(D)_PGD
Weight[kg]	29.5	29.5	40	65	32_PG D	32_PG D	65_PG D
Cooling	Air-Cooled			Water-Cooled	Air-Cooled		Water Cooled or Air Cooled
*Wave	On : 1ms ~ 72ms (Full-time output without "Wave" function when this parameter set "OFF".) / Period : 10ms ~ 80ms / Extra Wave : 0ms(OFF) ~ 75ms						

※ Cable Duct + 129mm

※ Specifications subject to change without notice

DC Power Supply for Arc Ion Plating

477.2
463.3
443.3
177

258.6
218.6
37.7
101.6
37.7
3

DC & Pulse Power Supplies for Ion Cleaning & Bias

Applications

- Cleaning & Biasing
- Surface treatment

Enhanced Process Control

- Wide operating range
- Enhanced low voltage arc control

Advantages

Customized Functions

- High speed control of current using DSP Technology
- Built-in auto trigger circuit
- Protect target by preventing abnormal discharge with low voltage detection circuit
- Enhance durability by preventing the accumulation of dust/ particles
- Easy to install with compact design and high power density
- Reduced noise with built-in EMI filter
- Self-diagnosis (protection, limit)

Applications

- Coating for tools and molds
- DLC coating
- Automotive and decorative parts
- Metal mobile phone cases

Items	Specifications
	Arc Works 200
Input	3Ø 220V/380V
Output Power	10kW
Output Voltage	50V / Trigger 130V
Output Current	200A
Interface	RS-232/485
Size[mm]	177(H)x218.6(W)x608.5(D)
Weight[kg]	17
Cooling	Air Cooled

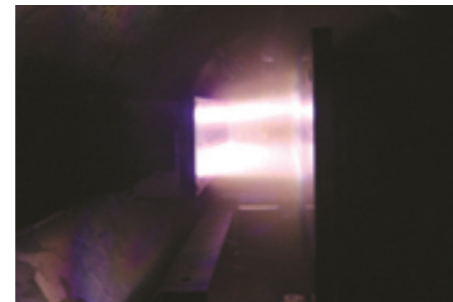
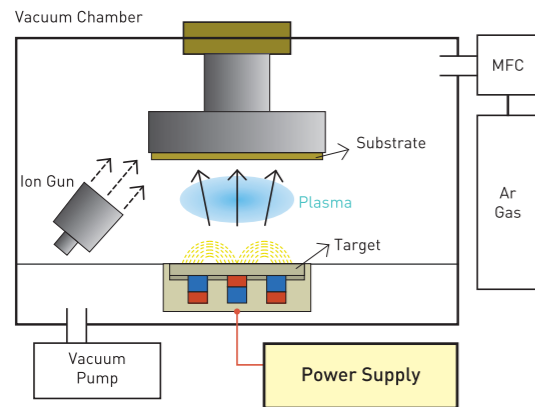
※ Specifications subject to change without notice

Items	Specifications							
	DC				Pulsed DC			
	Hercules 10	Hercules 20	Hercules 20S	EnerStream 30B	EnerPulse 5BHV	EnerPulse 10BHV	EnerPulse 16BHV	EnerPulse 30B
Input	3Ø 208V/220V/380V		3Ø 208V/380V	3Ø 380V	3Ø 208V/220V/380V		3Ø 380V	3Ø 400V
Ignition			1500V	1500V	1500V	1500V	1400V	1000V
Output	1200V, 8.3A / 300V, 33.3A	1200V, 16.7A / 250V, 80A	800V, 25A / 400V, 50A	1000V, 30A / 500V, 60A	1400V, 5A / 1000V, 6.5A	1400V, 10A / 1000V, 13A	1150V, 17.7A / 530V, 35A	1000V, 30A / 250V, 120A
Output Power	DC 10kW	DC 20kW	DC 20kW	DC 30kW	Pulsed DC 5kW	Pulsed DC 10kW	Pulsed DC 16kW	Pulsed DC 30kW
Output Frequency					20 ~ 120 kHz			1 ~ 100 kHz
Arc Energy	Less than 0.5mJ/kW				Less than 1mJ/kW			
Interface	RS-232 / RS-485 (Option : ProfiBus, DeviceNet)				RS-232 / RS-485			RS-232 / RS485 (Option : ProfiBus, DeviceNet)
Size[mm]	133(H)x483(W) x605(D)	133(H)x483(W) x605(D)	133(H)x483(W) x605(D)	133(H)x483(W) x605(D)	133(H)x483(W) x605(D)	133(H)x483(W) x605(D)	177(H)x483(W) x605(D)	309(H)x483(W) x782(D)
Weight[kg]	23.5	30.5	30.5	30.5	29	29	35	70
Cooling	Air-Cooled							

※ Cable Duct + 129mm

※ Specifications subject to change without notice

DC Power Supply for Ion Beam

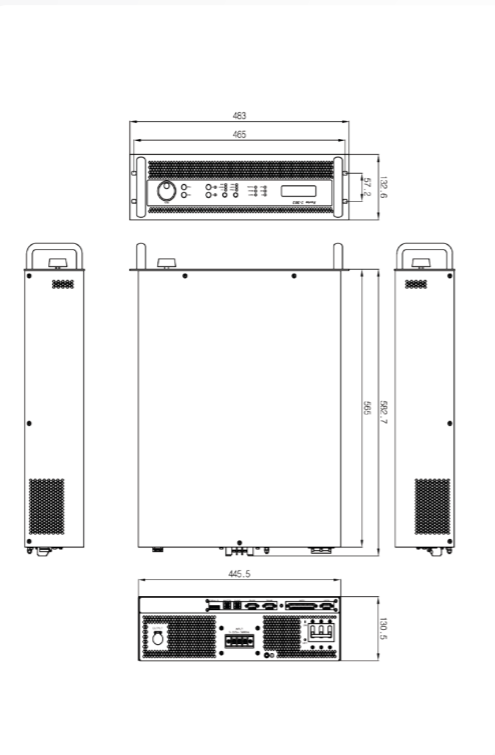


Applications

- Surface treatment with closed drift ion source
- Ion Beam Assisted Deposition
- Direct Deposition (DLC, etc)

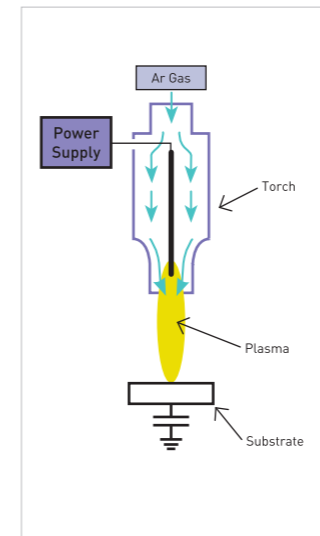
Items	Specifications
	Forte I-302
Input	3Ø 220V, 380V
Output power	6kW
Output voltage	3000V
Output current	2A
Arc energy	Less than 0.5mJ/kW
Interface	RS-232/485 (Option : ProfiBus, DeviceNet)
Size[mm]	133(H)x483(W)x605(D)
Weight[kg]	24.5
Cooling	Air-Cooled

※ Cable Duct + 129mm

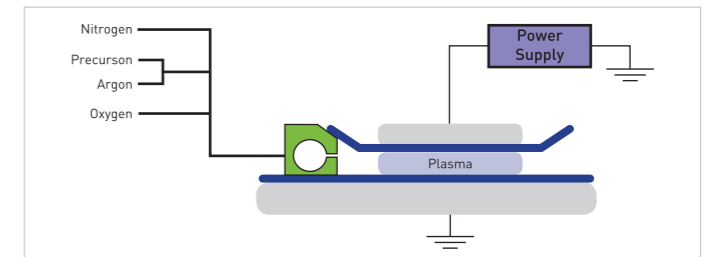


※ Specifications subject to change without notice

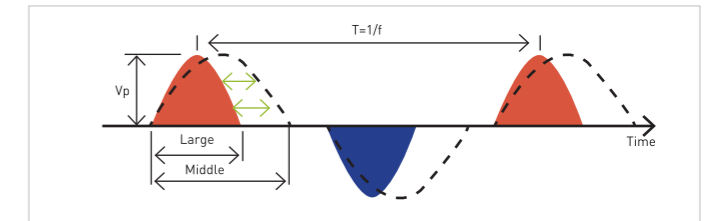
Quasi Pulse Power Supplies for Atmospheric Pressure Plasma



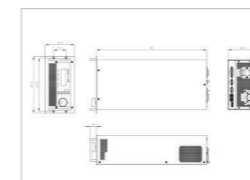
| Torch Type |



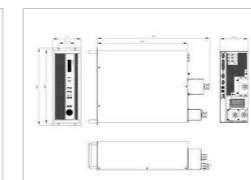
| DBD Type |



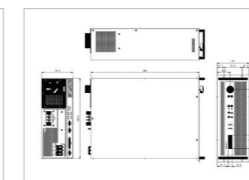
| Controlable Power Density Waveform |



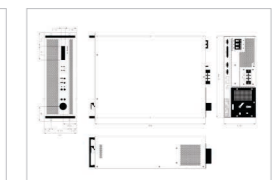
| Genius J-1000 |



| Genius 2 |



| Genius 6 |



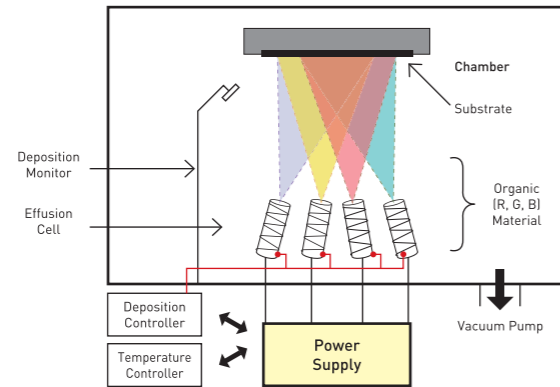
| Genius 10 |

Items	Specifications			
	Torch	DBD		
	Genius J-1000	Genius 2	Genius 6	Genius 10
Input	1Ø 220V	3Ø 220V		
Output Voltage	10kVpeak	10kVpeak / 12kVpeak / 15kVpeak		
Output Power	Quasi Pulsed DC 1kW	Quasi Pulsed DC 2kW	Quasi Pulsed DC 6kW	Quasi Pulsed DC 10kW
Output Frequency	40 ~ 60kHz			
Interface	RS-232 / RS-485			
Size[mm]	132(H)x257(W)x531(D)	177(H)x483(W)x590(D)	177(H)x483(W)x627(D)	177(H)x483(W)x627(D)
Weight[kg]	8.5	28	37.5	37.5
Cooling	Air-Cooled			

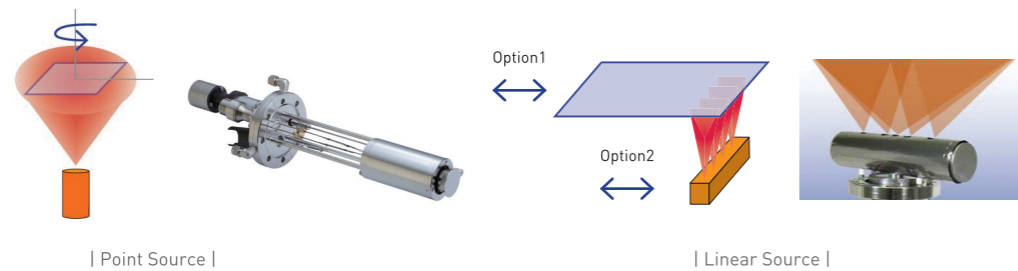
※ Cable Duct + 138mm

※ Specifications subject to change without notice

DC Power Supplies for OLED Heating Process



Evaporation of Point & Linear Source Application



Product Line-Up

NEOS Series



NEOS-200/400 (Input : 1Ø / 100~265V)



NEOS-750/1500 (Input : 1Ø / 100~265V)



NEOS-2000/3000 (Input : 1Ø, 3Ø / 220V)



NEOS-5000/10K (Input : 3Ø / 220V, 380V)

Single Output

EnerFlex Series



Dual Output

NEOS Series Product Line-Up

Model	Maximum Voltage(V)														Power(W)	Type		
	10	20	30	36	40	50	60	80	100	150	200	300	500	600				
NEOS-200		●		●												200	3 1/4 U	Module
NEOS-400		●		●												400		
NEOS-800		●		●												800		
NEOS-750					●		●	●		●						750	1U	19" Standard Rack
NEOS-1500					●		●	●		●						1,500	1U	
NEOS-2000			●			●	●	●	●		●					2,000	2U	
NEOS-3000			●			●	●	●	●		●	●				3,000	2U	
NEOS-5000	●	●	●			●	●	●	●	●	●	●	●			5,000	3U	
NEOS-10K	●	●				●	●		●	●	●	●	●	●		10,000	3U	
NEOS-15K											●	●	●			15,000	3U	

EnerFlex Series Product Line-Up

Items	Specifications						
	2ch						1ch
	EnerFlex3.3D	EnerFlex5.5D	EnerFlex10D	EnerFlex10D	EnerFlex14D	EnerFlex15D	EnerFlex15S
Input	3Ø 440V						
Output Voltage	300V	500V	150V	500V	700V	150V	150V
Output Current	11A	11A	66A	20A	20A	100A	100A
Output Power	3.3kW	5.5kW	10kW	10kW	14kW	15kW	15kW
Interface	RS-232 / RS-422						
Size[mm]	133[H]x483[W]x617[D]			177[H]x483[W]x667[D]			
Weight[kg]	24	24	39.5	39.5	39.5	39.5	30
Cooling	Air-Cooled						



Power Supplies for Plasma Applications

Power supplies
for In-line Sputter system