EnerStream

CE RoHs

DC Power Supply for Magnetron Sputtering

Features

High Reliability

- Optimized for DC sputtering process
- Very stable topology with drooping characteristics
- 32bit DSP enables high speed and precision control
- Lower interference and noise
- Reduced output ripple
- Higher endurance for Sag (SEMI F47)

Highly Reliable Arc Control

- Lowest Arc Energy (Less than 0.5mJ/kW)
- High speed arc detection and Interruption
- Superior control features of rapid changing impedance
- Built-in arc control parameter

Excellent Performance

- Wider operating range (400V/50A~800V/25A, 20kW)
- Easy parallel operation (up to 160kW / 8units)
- Constant power and current control
- Interconnection with PulseGen (Pulse modulator) allows to be high-capacity pulse power supply
- User Friendly interface

Specifications

Items	Specifications		
	EnerStream 10	EnerStream 15	EnerStream 20
Input Voltage	3ϕ, 208 / 220 / 380 / 440Vac, 50-60Hz		
Output Power	10kW	15kW	20kW
Output Voltage	800V (1500V Ignition)		
Output Current	25A (400V)	37.5A (400V)	50A (400V)
Regulation	Power / Current / Voltage		
Control Mode	Host, Remote, Local		
Arc Energy	Less than 0.5mJ/kW		
Cooling	Forced Air		
Size [mm]	133 (H) × 483 (W) × 605 (D)		
Weight [kg]	26.5	29.5	29.5

• Complied with RoHs (Option)

Benefits

- Improved thin film quality by high performance
- Allows easy system and process integration
- User friendly operation
- Increases production yields
- Lower cost of ownership

Applications

- Semiconductor wafer Sputter
- Metal & TCO deposition for TFT LCD & Color filter
- PDP Filter, OLED Sputter
- Thin film solar cell
- Architecture Glass, Data Storage
- Interior/Exterior deposition of Mobile phone case
- ITO deposition for touch panel
- Automotive Wheel and Headlamp, FCCL
- Ion Nitriding

SK Ventium 102-11F, Danjeong-dong 522, Gunpo, Gyeonggi, 435-776
Tel. +82-31-429-7794 Fax. +82-31-429-7795 www.entech.biz sales@entech.biz

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Pulse Gen

High Capacity DC Pulsing Modulator for Single Magnetron Sputtering
(Interconnection with EnerStream DC Power Supply)

Features

High Reliability

- High density pulse plasma control
- Optimized for pulse sputtering process
- Very stable topology with drooping characteristics
- 32bit DSP enables high speed and precision control
- Lower interference and noise

Highly Reliable Arc Control

- High speed arc detection and Interruption
- Lowest Arc Energy (Less than 1mJ/kW)
- Superior control features of rapid changing impedance
- Built-in arc control parameter

Excellent Performance

- Wider operating range (400V/100A~800V/50A, 40kW)
- Easy parallel operation and pulse synchronization
- Interconnection with EnerStream 20 (DC Power Supplies) allows to be high-capacity pulse power supply
- Adjustable frequency and pulse width

Specifications

Items	Specifications	
	PulseGen 20	PulseGen 40
AC Input	1φ, 220Vac, 50-60Hz	
DC Input	3φ, 208 / 220 / 380 / 440Vac, 50-60Hz	
Output Power	20kW	40kW
Output voltage	800V (Max. 1200V)	
Maximum current	50A	100A
Regulation	Power / Current / Voltage	
Waveform	Pulsed DC	
Frequency	50~100kHz	50~80kHz
Off Time	1.5~7us, DC mode	
Arc Energy	Less than 1mJ/kW	
Cooling	Forced Air	
Size [mm]	133(H) × 483(W) × 605(D)	
Weight [kg]	24	32

Benefits

- Improved thin film quality by high performance
- Allows easy system and process integration
- User friendly operation
- Increases production yields
- Lower cost of ownership

Applications

- TCO deposition for TFT LCD
- PDP Filter, OLED Sputter
- Thin film solar cell
- Architecture Glass, Data Storage
- Interior/Exterior deposition of Mobile phone case
- ITO deposition for touch panel
- Nitride and oxide layer deposition
- Ion Nitriding

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Ener Pulse

Pulsed DC Power Supply for Single Magnetron Sputtering

Features

High Reliability

- High density pulse plasma control
- Optimized for pulse sputtering process
- Very stable topology with drooping characteristics
- 32bit DSP enables high speed and precision control
- Lower interference and noise
- Higher endurance for Sag (SEMI F47)

Highly Reliable Arc Control

- Lowest Arc Energy (Less than 1mJ/kW)
- High speed arc detection and Interruption
- Superior control features of rapid changing impedance
- Built-in arc control parameter
- Lower output ripple and system energy

Excellent Performance

- Wider operating range
- Adjustable frequency and pulse width

Specifications

Items	Specifications		
	EnerPulse 5	EnerPulse 10	EnerPulse 10LV
Input Voltage	3ϕ, 208 / 220 / 380 / 440Vac, 50-60Hz		
Output Power	5kW	10kW	10kW
Output Voltage	800V(Max. 1200V)	800V(Max. 1200V)	650V(Max. 1050V)
Output Current	12.5A	25A	33.3A
Regulation	Power / Current / Voltage		
Waveform	Pulsed DC		
Frequency	20~150 kHz		
Off Time	1.5~7us, DC mode		
Arc Energy	Less than 1mJ/kW		
Cooling	Forced Air		
Size [mm]	133 (H) × 483 (W) × 605 (D)		
Weight [kg]	26.5	29.5	29.5

Benefits

- Improved thin film quality by high performance
- Allows easy system and process integration
- User friendly operation
- Increases production yields
- Lower cost of ownership

Applications

- TCO deposition for Display (LCD, OLED, etc.)
- PDP Filter, Thin film solar cell
- Architecture Glass, Data Storage
- Exterior deposition of Mobile phone case
- ITO deposition for touch panel
- Nitride and oxide layer deposition
- Pulse Cleaning, PECVD process

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Ener Pulse Duo

Bi-polar Pulse Power Supply for Dual Magnetron Sputtering

Features

High Reliability

- High density pulse plasma control
- Optimized for dual magnetron pulse sputtering process
- Very stable topology with drooping characteristics
- 32bit DSP enables high speed and precision control
- Lower interference and noise
- Higher endurance for Sag (SEMI F47)

Highly Reliable Arc Control

- Minimized Arc Energy (Less than 1mJ/kW)
- High speed arc detection and Interruption
- Superior control features of rapid changing impedance
- Lower output ripple and system energy

Excellent Performance

- Wider operating range
- Adjustable frequency and pulse width

Specifications

Items	Specifications	
	EnerPulse 5 Duo	EnerPulse 10 Duo
Input voltage	3φ, 208 / 220 / 380 / 440Vac, 50-60Hz	
Output Power	5kW	10kW
Output Voltage	800V(Max. 1200V)	
Maximum Current	12.5A	25A
Regulation	Power / Current / Voltage	
Waveform	Symmetric bi-polar Pulse	
Frequency	20~50kHz	
Off Time	2~6us	
Arc Energy	Less than 1mJ/kW	
Cooling	Forced Air	
Size [mm]	133(H) × 483(W) × 605(D)	
Weight [kg]	26.5	29.5

Benefits

- High quality thin film by minimized Target contamination
- Allows easy system and process integration
- User friendly operation
- Increases production yields
- Lower cost of ownership

Applications

- TCO deposition for Display (LCD, OLED, etc.)
- PDP Filter, Thin film solar cell
- Architecture Glass, Data Storage
- Exterior deposition of Mobile phone case
- ITO deposition for touch panel
- Optical deposition (AR Coating, etc.)
- Nitration & Oxide deposition
- Pulse Cleaning, De-smear, PECVD Process

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Pulse Gen Duo

High Capacity Pulse Modulator for Dual Magnetron Sputtering
(Interconnection with EnerStream DC Power Supply)

Features

High Reliability

- High density pulse plasma control
- Optimized for dual magnetron pulse sputtering process
- Very stable topology with drooping characteristics
- 32bit DSP enables high speed and precision control
- Lower interference and noise

Highly Reliable Arc Control

- Excellent Arc Energy (Less than 1mJ/kW)
- Superior control features of rapid changing impedance

Excellent Performance

- Wider operating range
- Adjustable frequency and pulse width
- Interconnection with EnerStream 20 (DC Power Supplies) allows to be high-capacity pulse power supply

Specifications

Items	Specifications	
	PulseGen 20 Duo	PulseGen 30 Duo
AC Input	1 ϕ , 220Vac, 50/60Hz	
DC Input	3 ϕ , 208 / 220 / 380 / 440Vac, 50-60Hz	
Output Power	20kW	30kW
Output Voltage	800V(Max. 1200V)	
Maximum Current	50A	75A
Regulation	Power / Current / Voltage	
Waveform	Symmetric bi-polar Pulse	
Frequency	20~50 kHz	20~40 kHz
Off Time	2~6us	
Arc Energy	Less than 1mJ/kW	
Cooling	Forced Air	
Size [mm]	133 (H) × 483 (W) × 605 (D)	
Weight [kg]	24	33

Benefits

- High quality thin film by minimized Target contamination
- Allows easy system and process integration
- User friendly operation
- Increases production yields
- Lower cost of ownership

Applications

- TCO deposition for Display (LCD, OLED, etc.)
- PDP Filter, Thin film solar cell
- Architecture Glass, Data Storage
- Exterior deposition of Mobile phone case
- ITO deposition for touch panel
- Optical deposition (AR Coating, etc.)
- Nitration & Oxide deposition
- Pulse Cleaning, De-smear, PECVD Process

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EnerWorks / IDU-200N

DC Power Supply for Cathodic Arc Ion Plating

Features

High Reliability

- Optimized control for cathodic arc process
- Very stable topology with drooping charateristics
- 32bit DSP enables high speed and precision control
- Reduced output ripple
- Lower interference and noise
- Inner circulation cooling (EnerWorks)
- Compact Size

Excellent Performance

- Abnormal arc diagnosis and interception
- Auto trigger & restart
- Self-diagnosis
- Parallel operation

Specifications

Items	Specifications	
	EnerWorks 100	IDU-200N
Input Voltage	3ϕ, 208 / 220 / 380Vac, 50-60Hz	
Output Power	5kW	10kW
Output Voltage	50V(Max. 70V)	
Output Current	100A	200A
Regulation	Current	
Control Mode	Host, Remote, Local	
Cooling	Forced Air	
Size [mm]	133(H) × 483(W) × 543(D)	178(H) × 483(W) × 605(D)
Weight [kg]	27.5	31.0

Benefits

- Allows easy system and process integration
- User friendly operation
- Increases production yields
- Lower cost of ownership

Applications

- Hard coating for tools and metal frames
- Decorative color coating
- Automotive and electrical parts coating
- Hard coating for Metal mobile phone case

[Cathodic Arc]

SK Ventium 102-11F, Danjeong-dong 522, Gunpo, Gyeonggi, 435-776
Tel. +82-31-429-7794 Fax. +82-31-429-7795 www.entech.biz sales@entech.biz

EN TECHNOLOGIES Creative Energy to the World

Hercules

CE

DC Power Supply for Ion Cleaning & Bias

Features

High Reliability

- Optimized control for High Voltage ion cleaning & Low Voltage Bias process
- Very stable topology with drooping characteristics
- 32bit DSP enables high speed and precision control
- Lower interference and noise
- Higher endurance for Sag (SEMI F47)

Highly Reliable Arc Control

- Lowest Arc Energy (Less than 1mJ/kW)
- Superior control features of rapid changing impedance
- Built-in arc control parameter
- Excellent control of abnormal arc

Excellent Performance

- Wider operating range optimized cleaning & Bias (1200V/16.7A~250V/80A, 20kW)
- Automatic change in high voltage and current mode
- Parallel operation
- Enable of limit set of Voltage/Current/Power
- Stable glow discharging

Benefits

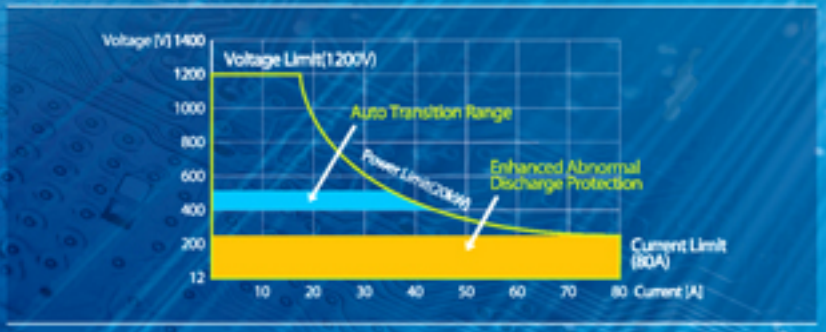
- Improved thin film by high performance
- Enables of ion cleaning & bias with one unit
- Allows easy system and process integration
- User friendly operation
- Increases production yields
- Lower cost of ownership

Applications

- Ion Bombardment (High voltage Cleaning)
- Bias

Specifications

Items	Specifications	
	Hercules 10	Hercules 20
Input Voltage	3φ, 208 / 220 / 380 / 440Vac, 50-60Hz	
Output Power	10kW	20kW
Output Voltage	1200V	
Output Current	33.3A(300V)	80A(250V)
Regulation	Voltage / Current / Power	
Control Mode	Host, Remote, Local	
Arc Energy	Less than 1mJ/kW	
Cooling	Forced Air	
Size [mm]	133(H) × 483(W) × 605(D)	
Weight [kg]	26.5	29.5



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Ener Pulse HV

Uni-polar Pulse Power Supply for Ion Cleaning & Bias

Features

High Reliability

- Optimized with HV ion cleaning & LV Bias process
- Very stable topology with drooping characteristics
- 32bit DSP enables high speed and precision control
- Lower interference and noise
- Higher endurance for Sag (SEMI F47)

Highly Reliable Arc Control

- Lowest Arc Energy (Less than 1mJ/kW)
- High speed arc detection and Interruption
- Superior control features of rapid changing impedance
- Built-in arc control parameter

Excellent Performance

- Wide frequency range
- Variable duty control

Benefits

- Improved thin film by high performance
- Enables of ion cleaning & bias with one unit
- Allows easy system and process integration
- User friendly operation
- Increases production yields
- Lower cost of ownership

Applications

- Ion Bombardment [High voltage Cleaning]
- Pulse Bias

Specifications

Items	Specifications	
	EnerPulse 5HV	EnerPulse 10HV
Input Voltage	3ϕ, 208 / 220 / 380Vac, 50-60Hz	
Output Power	5kW	10kW
Output Voltage	1400V	
Output Current	6.5A	13A(up to 40A, Option)
Regulation	Voltage / Current / Power	
Waveform	Uni-polar Pulse	
Frequency	20~120kHz	
Off Time	25~90%	
Control Mode	Host, Remote, Local	
Arc Energy	Less than 1mJ/kW	
Cooling	Forced Air	
Size [mm]	133(H) × 483(W) × 605(D)	
Weight [kg]	26.5	29.5

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Forte I

CE

DC Power Supply for Ion Beam Discharge

Features

High Reliability

- Optimized control for Ion Beam discharging
- Very stable topology with drooping characteristics
- 32bit DSP enables high speed and precision control
- Reduced output ripple
- Lower interference and noise
- Higher endurance for Sag (SEMI F47)

Highly Reliable Arc Control

- Lowest Arc Energy (less than 1mJ/kW)
- High speed arc detection and Interruption
- Superior control features of rapid changing impedance
- Lower output ripple and stored energy

Specifications

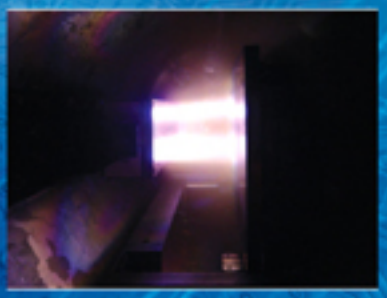
Items	Specifications
	Forte I-302
Input voltage	3φ, 220Vac, 50-60Hz
Output Power	6kW
Output Voltage	3000V
Output current	2000mA
Regulation	Voltage / Current / Power
Control Mode	Host, Remote, Local
Arc Energy	Less than 1mJ/kW
Cooling	Forced Air
Size [mm]	133(H) × 483(W) × 565(D)
Weight [kg]	18.5

Benefits

- Allows easy system and process integration
- User friendly operation
- Increases production yields
- Lower cost of ownership

Applications

- Surface Treatment
- Ion Beam Assisted Deposition
- Direct Deposition (DLC, etc)



[Ion Beam]

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Genius

CE RoHs

Quasi-Pulse Power Supply for Atmosperic Plasma Discharge

Features

High Reliability

- High density pulse plasma control
- Optimized for DBD (Dielectric Barrior Discharging) process
- Very stable topology with drooping characteristics
- 32bit DSP enables high speed and precision control
- Lower interference and noise

Excellent Performance

- Quasi-Pulse
- Wider operating range
- Adjustable frequency (20~ 60kHz)
- Variable pulse width [7steps]
- High effective power & Instantaneous power capability
- Enhanced process efficiency than sign wave

Benefits

- Allows easy system and process integration
- User friendly operation
- Increases production yields
- Lower cost of ownership
- Forced Air Cooling
- Customized

Applications

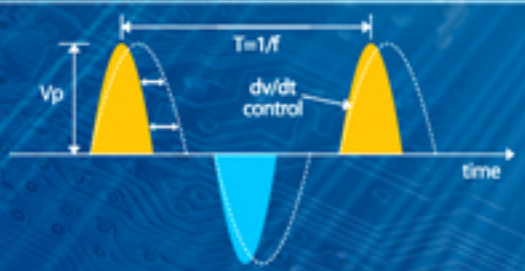
- Surface Cleaning
- Surface Activation
- PR Ashing
- Dry Etching

Specifications

Items	Specifications		
	Genius 2	Genius 6	Genius 10
Input voltage	3ϕ, 220Vac, 50-60Hz		
Output Average Power	2kW	6kW	10kW
Output Peak Power	6kVA	18kVA	30kVA
Output Voltage	4~10kV 5~12kV 6.5~15kV	2~10kV 2~12kV 2~15kV	2~10kV 2~12kV 2~15kV
Output frequency	20~60kHz		
Regulation	Voltage / Power		
Waveform	Quasi-Pulse		
Control Mode	Host, Remote, Local		
Cooling	Forced Air		
Size [mm]	133(H)×483(W)×605(D)	178(H)×483(W)×605(D)	
Weight [kg]	25	34	35

- Max. frequency and pulse width will be limited Capacitance value of electrodes
- Complied with RoHs(Option)

[Quasi Pulse Waveform]



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EnerWorks 100c

DC Power Supply for Battery Charging

Features

High Reliability

- Built-in high speed battery charging algorithm (CC mode, CV mode)
- Optimized for battery charging 32bit DSP enables high speed and
- precision control
- Lower interference and noise
- Reduced output ripple
- Highly stable charging and durability
- Compact Size
- UL Certificate

Excellent Performance

- Auto restart
- Protection by battery status diagnosis
- Built-in self-diagnosis
- Parallel operation (Max. 400A/4EA)

Benefits

- Allows easy system integration interface [PLC, RS-232]
- User friendly operation
- Increases production yields
- Lower cost of ownership

Applications

- Lithium Polymer / Lithium Ion Battery Optimal Charging

Specifications

Items	Specifications
	EnerWorks 100C
Input Voltage	3ϕ, 380Vac, 50-60Hz
Output Power	10kW
Output Voltage	100V
Output Current	100A
Regulation	Current
Control Mode	Host, Remote, Local
Cooling	Forced Air
Size [mm]	133(H) × 483(W) × 543(D)
Weight [kg]	27.5

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