

neyco

VACUUM & MATERIALS



PLASMA POWER SUPPLIES



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DC Power Supplies DC 05 - DC 30

The compact power supplies were developed for small magnetrons in production plants and laboratories. Easy and safe operation make these power supplies very flexible for many processes. The arc-handling adjusts automatically to different process parameters, so that programming is not necessary. The units are designed for the mounting in 19"-racks.



DC 05-30/800 specifications:

	DC 05/800	DC 10/800	DC 15/800	DC 20/800	DC 30/800
Nominal power	0.5 kW	1 kW	1.5 kW	2 kW	3 kW
Output voltage	800 V Plus pole grounded				
	Option: Minus pole grounded		Option: Floating		
Output current	0.9 A	1.7 A	3 A	3.5 A	5.3 A
Control	Current, voltage or power controlled				
Modes of operation	Manual via front panel or external via A/D interface AS 4, AS 4 F or Profibus				
Set point	0 ... 100 % of nominal voltage, current or power				
Output accuracy	+/- 1 % of nominal value for voltage, current and power				
Arc suppression	Quenching time: 6 μ s up to 3 ms, automatically Delay time: 6 μ s up to 10 ms, automatically				
Indications	3 ½ digit display for voltage, current and power				
Noise emission	$L_{pA} < 70$ dB (A)				
Mains connection	230 V, +5 % / -10 %, 50/60 Hz, (Option: 200 V, L1, L2, PE)		3 x 400 V, +5 % / -10 %, 50/60 Hz, (Option: 3 x 200 V, only GS 15 and GS 20), PE		
Power consumption	0.6 kVA	1.2 kVA	1.8 kVA	2.4 kVA	3.6 kVA
Fusing	6 A	6 A	6 A (10 A)	6 A (10 A)	10 A
High voltage connection	RG 213 or JZ-600-Y-CY, 2 x 1.5 mm ²				
Cooling	Forced air, maximum ambient temperature 40° C				
Size	½ 19" slide-in, 3 HU (132.5 mm), 560 mm deep				
Weight	11 kg		12 kg		

DC 05-30/1000 specifications:

	DC 05/1000	DC 10/1000	DC 12/2000	DC 15/1000	DC 20/1000	DC 30/1000
Nominal power	0.5 kW	1 kW	1.2 kW	1.5 kW	2 kW	3 kW
Output voltage	1000 V		2000 V	1000 V		
	Plus pole grounded					
	Option: Minus pole grounded			Option: Floating		
Output current	0.7 A	1.4 A	1 A	2.4 A	2.8 A	4.2 A
Control	Current, voltage or power controlled					
Modes of operation	Manual via front panel or external via A/D interface AS 4, AS 4 F or Profibus					
Set point	0 ... 100 % of nominal voltage, current or power					
Output accuracy	+/- 1 % of nominal value for voltage, current and power					
Arc suppression	Quenching time: 6 µs up to 3 ms, automatically Delay time: 6 µs up to 10 ms, automatically					
Indications	3 ½ digit display for voltage, current and power					
Noise emission	$L_{pA} < 70$ dB (A)					
Mains connection	230 V, +5 % / -10 %, 50/60 Hz, (Option: 200 V, L1, L2, PE)			3 x 400 V, +5 % / -10 %, 50/60 Hz, (Option: 3 x 200 V, only GS 15 and GS 20), PE		
Power consumption	0.6 kVA	1.2 kVA	1.4 kVA	1.8 kVA	2.4 kVA	3.6 kVA
Fusing	6 A	6 A	10 A	6 A (10 A)	6 A (10 A)	10 A
High voltage connection	RG 213 or JZ-600-Y-CY, 2 x 1.5 mm ²					
Cooling	Forced air, maximum ambient temperature 40° C					
Size	½ 19" slide-in, 3 HU (132.5 mm), 560 mm deep					
Weight	11 kg			12 kg		

ARC Generator

The most reliable high performance generator for high current CAE Processes with high efficiency (> 90 %)

The **ARC150/250** is a DC power supply specifically designed for CAE sources. The system comes in a compact and light 19 inch case.



The **ARC150/250** design has taken into account the typical system integrator needs.

Some highlights:

- The unit is only 178mm high. Up to 6 units can be installed in a single cabinet saving space and installation costs.
- In a typical application, with a rectangular CAE source running at 220A / 20V the total power dissipated is only 400W .
- Flexible interfacing. Profibus (Option), RS232 and analog user port are available.
- The cooling system is using high efficiency oversized heat sinks and variable speed control for fans. The unit can run at full power 40°C temperature without interruptions.
- Contactless ignition module integrated in the unit is available on request.

Power supply	400V 3 phase + PE /13Amps max
Connector style	ILME 40A
Dimensions	Rack mount 4UI (480*490*178 mm)
Weight	25kg
Output current	20 to 150 or 250A
Output voltage full load	25V DC @ 150 or 250A
Max power	3.750 / 6.250 Watt
Output connectors	19mm brass panel mount
Cooling	Forced air with variable speed fan control
Digital interface	RS232 and Profibus, other on request
Analog interface	0 to 10V analog signals, 24V digital, interlock
Ambient	5 to 40°C , pollution 2
Efficiency	Typicall 90%
Ignition module	650V – 1Hz pulse rate (OPTION)
Designation	CE Declaration of conformity available upon request

EMC classification according to EN55011:

This is a ISM (industrial scientific medical) equipment and is compliant to EN55011 group 2, class A.

CE MARK

MF Generator

MF 5/10kW 40kHz, High Voltage AC plasma generator

The BDS-MF is a 40 kHz plasma generator with max power delivery of 5kW or 10 kW is specifically designed for plasma excitation on PECVD or plasma cleaning applications.

The unit is capable of delivery up to 10kW (5KW) at 5000V RMS output. The output is balanced type, capable to drive 2 symmetrical electrodes. Typical application is PECVD process on large process

chambers. A unique features is the high voltage matching transformer built in 2 (standard) or 3 (on request) transformer taps are available as impedance matching.

User only needs to connect two coaxial cables to the electrodes. Interface with the user's PLC can be both analog or digital RS232 or Profibus (upon request).



Highlights and benefits:

- Output matching transformer is built in. No external box is required.
- Air cooled unit. No risk associated with moisture or water leakage.
- Full power with ambient temperature up to 40°C.
- Analog interface.
- Fieldbus interface available upon request.
- Front panel display makes installation and troubleshooting easier.
- High efficiency >90%.
- Compact and lightweight construction, only 20kg, 4UI

Specifications:

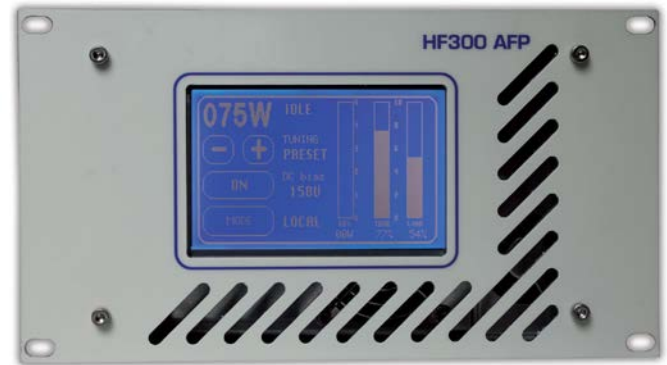
	MF5k	MF10k
Output Load	5 kWatt on 2000 Ohm load	10 kWatt on 2000 Ohm load
AC Supply	3 x 400 Vac +/- 10% 50 / 60 Hz, 10A (L1, L2, L3, PE)	3 x 400 Vac +/- 10% 50 / 60 Hz, 18 A (L1, L2, L3, PE)
Dimensions	19 inch rack style, 4UI height (177mm) 540mm dept	
Weight	20kg, hard robust aluminium case	
Cooling	Forced air, high efficiency heat sinks operate up to 40°C ambient temperature	
Output voltage	Up to 5000V (7000 V as option) on tap2 at 2000ohm load	
Output current	Up to 3,5 A on tap1, Up to 2,5 A on tap2	
Output Connection	Balanced 2 x Fischer 105 connectors for RG214/U coaxial cable	
Ignition voltage	Greater than 5500 Vrms	
Arc detection	Based on primary overcurrent, 1 microsecond reaction time	
User interface	DB25 connector, analog signal 10V, digital 24V pinout compatible with Advanced Energy PEII © RS232 or Profibus (optional)	
Front panel	LCD display 2x40 characters highly readable	
Protection	Overcurrent, open load, arcs, mains under voltage, overtemperature	
Measurement	RMS voltage, RMS current, active power delivered	
Regulation	Power regulation mode	
HV transformer	Built in 2 taps 1000 Ohm, 2000 Ohm	
Designation	CE Declaration of conformity available upon request	

HF 200 300 750 Family Active Front Panel

NEYCO introduce a new family of low-medium power HF generators intended to satisfy the needs of laboratory grade and small low pressure industrial plasma systems.

- Model **HF200-300-750.AFP** 200, 300 and 750 W, Active Front Panel, direct tuner interface, optional external module.

The low-medium power AFP (Active Front Panel) series is a ½ rack mounted generator with direct tuner control and AFP with LCD touch screen display, friendly user interface software and RS 232-Profibus interfaces up on request. The unit can be configured also to drive 2 Auto matching networks as option.



- Common specifications on **Active Front Panel generator** families

The analog control module and the RF module are common to all families.

The RF mosfet type, output tuning elements and DC switching power supply.

The BDS HF series is a class E circuit with 85-90% typical efficiency.

The output power is modulated by means of a PWM circuit acting on the DC bus.

HF200-300.AFP Specifications for active front panel version:

Dimensions	132.5 x 269 x 410 [mm]
Weight	About 5 kg
Power requirements	World Wide mains supply 120 to 240Vac 50-60 Hz With PFC
Operating frequency	13.56 MHz \pm 0.005 % quartz controlled
Output power on 50 Ohm load	From 4 to max 750 W (different FS versions)
Maximum reflected power	20 %
Harmonic content	-40 dB below fundamental
Power detector	Forward and reverse power, linear scale 3% accuracy
Protection circuits	Excess reverse power, over temperature PA (Power Amplifier) overvoltage, PA over current
RF Output connector	N, female
User Interface	User friendly LCD touch screen display
User port connector	D-Type 9 pin, female Interlock function and remote RF ON
Interfaces	RS 232 – Profibus for remote control (up on request)
Tuner control	Full interfacing capability with matching units series BDS-AMXXX
Matching network port	D-Type 25 pin female
Operating temperature	From 10 to 40 °C, No condensation or icing
Cooling	Forced air with 80mm fan
Note	Optional: driver module for N° 2 auto matching networks

HF 100 200 300 750 Family Black Box

NEYCO introduce a new family of low-medium power HF generators intended to satisfy the needs of laboratory grade and small low pressure industrial plasma systems.

- Model HF100-200-300-750.BB: 100, 200, 300 and 750 W, black box style, only with analog 0-10 VDC port.

The low-medium power Black Box series is composed by one unit of 100, 200, 300 or 750 W @ 13.56 MHz output power in black box configuration with analog user port only, 0-10 VDC A/D Interface. The main 230 VAC has given by an external power supply provided together with the generator.

- Common specifications on HF Black Box (BB) generator families

The analog control module and the RF module are common to all families. The RF mosfet type, output tuning elements and DC switching power supply. The BDS HF series is a class E circuit with 85-90% typical efficiency. The output power is modulated by means of a PWM circuit acting on the DC bus.



HF.100-200-300-750.BB Black Box specifications:

	HF100.BB	HF200.BB	HF300.BB	HF750.BB
Dimensions	270 x 70 x 155 [mm]			132.5 x 269 x 410 [mm]
Weight	About 3.5 kg			
Power requirements	220VAC to 48 VDC Ext P.S			220VAC
Operating frequency	13.56 MHz \pm 0.005 % quartz controlled			
Output power on 50 Ohm load	From 4 to 100 W	From 4 to 200 W	From 10 to 300 W	From 10 to 750 W
Maximum reflected power	20 %			
Harmonic content	-40 dB below fundamental			
Power detector	Forward and reverse power, linear scale 3% accuracy			
Power setpoint signal	10 W/V, linear	20 W/V, linear	30 W/V, linear	100 W/V, linear
Incident power feedback	10 W/V, linear	20 W/V, linear	30 W/V, linear	100 W/V, linear
Reverse power feedback	10 W/V, linear	20 W/V, linear	30 W/V, linear	100 W/V, linear
RF on command	5 V or 24 V jumper selectable			
Alarm output	Open collector, max 50 mA			
Protection circuits	Excess reverse power, over temperature PA (Power Amplifier) overvoltage, PA over current			
RF Output connector	BNC			N female
User port connector	D-Type 15 pin, female			
Operating temperature	From 10 to 40°C , No condensation or icing			
Cooling	Forced air with 60mm fan			

BAA 600 Auto Matching Unit

NEYCO is introducing a new family of automatic matching network units operating at the standard ISM frequency of 13.56 MHz intended for industrial and laboratory use.

Typical applications include Sputtering process, PECVD deposition, plasma activation, dielectric heating, laser excitation and more.

The two standard configurations are L type network that best fits low impedance loads and TEE configuration for medium impedance loads.

Model BAA 600: Auto Matching based on variable air caps rated for 3000 V and 16 A analog user port pin compatible with BDS.HF 200-300 and 750 W generator's family.



The BAA600 is an auto matching unit to be used in HF (13.56 MHz) plasma application, transform the complex impedance of the load in a 50 ohm resistive. The tuning circuit is L type using high quality variable caps and precision positioning motors. Typical tuning type is less than 2 seconds.

A wide range of full preset or one channel only preset is possible. It's also possible a full independent operation with only one external switch to recall ignition position is required.

A DC BIAS measurement circuit permits to monitor Dc bias, scaled of a factor of 100.

Tuning Elements:	high grade air variable capacitors with high current sliding contacts. Option one vacuum capacitor in order to achieve Higher cathode Voltage and current
Power supply:	24 Vdc 800 mA max. (from the Neyco's HF generators or via an external P.S.)
Analog I/O:	10 V full scale
Digital I/O:	24 Vdc isolated
Input RF:	N type female
Output RF:	7/16 female to be used with RG393 Teflon cable
Max cathode voltage:	3000 Vac +dc
Max cathode current:	16 A RF
User connector:	D15 pin female
Operating modes:	Auto / Preset / Hold
Detector Type:	Passive phase magnitude detector, signal reversing possible
Dimensions:	190 x 340 x 175 mm

Direct interfacing with all Neyco's series RF generators.

3 Channel output (vacuum relays) OPTION.

BAM 200

Variable Inductor Manual Matching Unit

The BAM 200 is the most compact RF inductive manual matching network currently available on the market with some unique features described in the below specifications.

The intended use is in low pressure plasma system like sputtering, PECVD, plasma cleaning, plasma etching and plasma activation.

One of its key features is the very compact design and great advantages of the internal variable inductor circuit.



The optimal installation is directly above the vacuum chamber electrical feedthrough.

The mechanical layout can be adjusted to match any customer requirement.

BAM 200 Variable Inductor Manual Matching Unit specifications:

Dimensions:	L = 112 mm, H = 70 mm, D = 136 mm
RF input connector	BNC Female
DC bias connector	BNC Female
Working Frequency	13.56 MHz
Max RF current	6 Amps
Max RF voltage	3000 Vac
Max input power	200 Watt
Cooling	Forced Air, 24 Vdc fan

CE MARK

HIPULSE

For HIPIMS processes

The HiPulse power supplies are specifically designed for High Power Impulse Magnetron Sputtering. Pulses of up to 8 megawatts produce extremely dense metal plasma. High ion fluxes and high ion-to-neutral ratios yield films with superior mechanical characteristics.

Hard, homogeneous and smooth, these coatings are ideal for functional and decorative applications. The unique characteristics of ions created by HiPulse can also be used for metal ion etching (pre-sputter treatment) and semiconductor applications (trench filling).

HiPulse generators deliver repeated, short, megawatt pulses with up to 4 kA peak current and up to 2 kV peak voltage. However, short pulse durations and low duty cycles ensure that the average power stays within the kW range. This means you can use existing magnetrons, whether for laboratory or production systems, without modification.

The HiPulse power supplies consist of 2 sections: a DC power supply and a pulse unit. Standard models are available with 10 kW and 20 kW average output power. Models offering higher or lower power are available upon request.



DC unit



Pulse unit

Output Parameters		
Output Peak Power		1 MW to 8 MW
Output Average Power		Up to 20 kW ¹
Output Peak Voltage		1 kV to 2 kV
Output Peak Current		1 kA, 3 kA, 4 kA
Regulation Modes		Voltage
Efficiency		90 % – 92 % ²
Operation Duty Cycle		100 %
Regulation Line ±10 % Load 10 % – 90 %	Accuracy	± 1.0 %
	Repeatability	± 0.5 %
Output Polarity		Negative

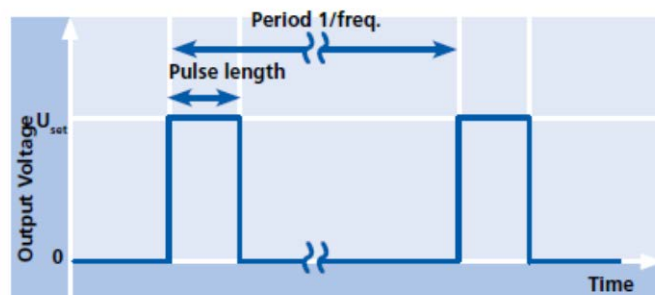
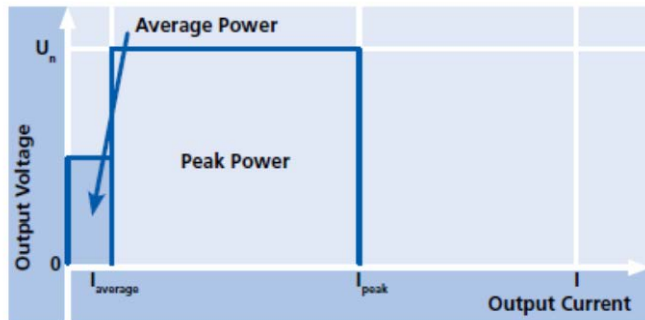
1) Depending on cathode max. average power.

2) Depending on model.

Pulsed Operation Parameters	
Pulse frequency	Up to 500 Hz
Pulse Duration	< 200 μs

Arc Detection Criteria	
I _{max} -Detection	Var. I _{max} treshold: 5 % – 105 %
Arc Detection Time	< 500 ns

Input Parameters	
Line Voltage	3 x 400 V ± 10 %
Line frequency	50 Hz / 60 Hz ± 5 %



Cooling Specifications	
Cooling System	Forced Air Cooling / Fan Control
Max. Inlet Air Temperature	+35 °C

Environmental Specifications	
Ambient Temperature	+5 °C to +35 °C operating -25 °C to +55 °C storage
Max. Humidity	80 % non condensing
Max. Operating Altitude	2 000 m above sea level ³

3) Special high altitude versions available upon request.

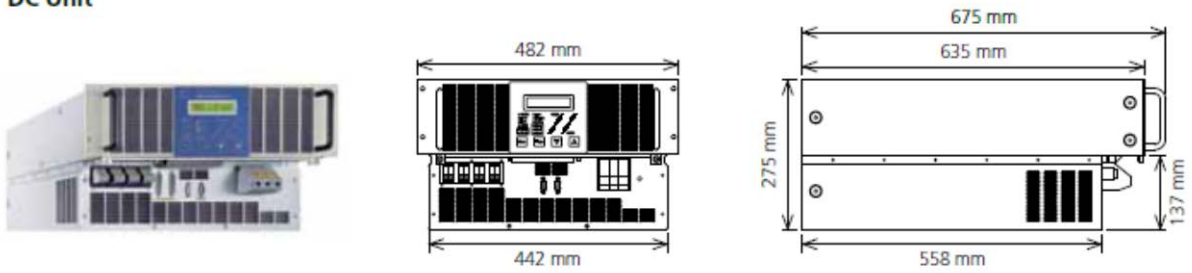
Interfaces	
Analog / Digital	25-pin Sub-D
RS 232 / RS 485	9-pin Sub-D
PROfibus ⁴	9-pin Sub-D
Connection Type	Front

4) Optionally available.

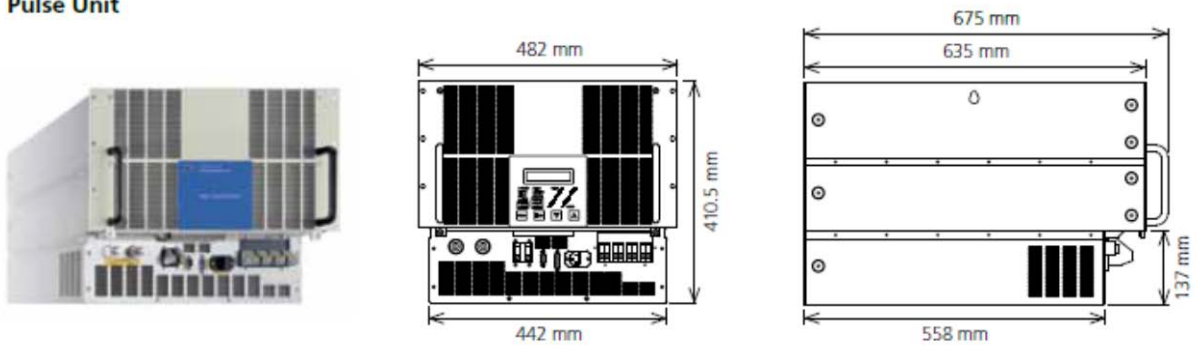
Dimensions (W x H x D)	
DC Unit	483 mm x 632 mm x 675 mm
Pulse Unit	483 mm x 635 mm x 676 mm
Weight	
DC Unit ⁵	75 kg
Pulse Unit ⁵	50 kg

5) The numbers indicate minimum weight. Depending on model.

DC Unit



Pulse Unit



DC GLOW High Voltage DC Power Supply

The BDS-GLOW is a DC High Voltage Power Supply, specifically designed for plasma Glow Discharge and ION SOURCE application. Is available in the 2000 or 4000V with 3kW power capacity full scale with positive or negative output.

Several protection and limiting circuits have been implemented to satisfy the most critical applications.

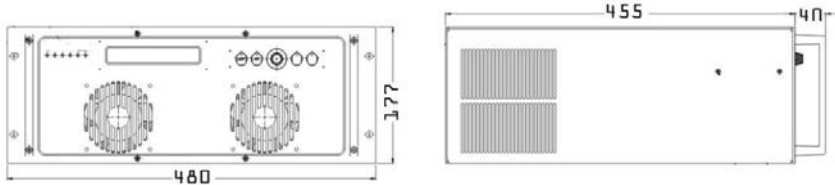
The arc detection circuit sense plasma arcing end cause immediate shutdown and restart after a user-defined dead time. Overcurrent, overvoltage, over temperature circuits are included.

The high frequency inverter is equipped with last generation IGBT transistor obtaining mains to output efficiency greater than 90%.

The interfacing with user application can be by analog user port or (Optional RS232). The front panel is equipped with LCD display and active front panel is available as option for local manual control.



Technical data:

Output voltage	from 300V a 4000V	150V a 2000V
Output current	Up to 800mA	Up to 1.6 A
Output polarity	Negative, (or Positive on request)	
Output connector	Fischer, type 105, 10kV rating for RG213 coax cable	
Mains input	3x400Vac +/- 10% 50Hz (L1,L2,L3 PE)	
Dimensions	Standard Rack 19" 4U=177mm High 	
Weight	12kg	
Cooling	Forced Air	
Working temperature	15-35°C	
Protection circuits	Inverter Over temperature Mains under - overvoltage Output current limit(LED Overcurrent) Output overvoltage	
ARC Handling	dV / dt, soft start ramp	
Interfacing	Analog user port with 10V scaled signals and 24V digital commands on DB25	
Interlock	Contact closure to enable HV output	

Plasma Matrix Series

Plasma Matrix & Super Plasma Matrix : RF 13.56 MHz Vacuum Plasma Reactors

Very price competitive Table Top RF plasma reactor system series for most of the Cleaning/Etching process in R/D or small Industrial pilot production (from 2.5 to 40 liters SS 304 vacuum chambers).

The Plasma Matrix & Super Plasma Matrix table top plasma reactors are designed to fulfil most of the R/D and industrial application of Plasma cleaning, etching and surface activation where the initial machine investment has to be kept very low.

The easy and friendly use (through a LCD touch screen display) of the tool software together with the optimized design of the SS vacuum chamber of the Matrix series , put them on the top level of what offered by the today market.

The Bdiscom Matrix plasma reactors series includes all the functions needed to keep the plasma process stable and repeatable as required by different R/D and industrial applications.

Most significant applications:

- Plasma activation
- Plasma etching
- Low temperature Plasma ashing
- SEM and TEM sample preparation
- Fine cleaning of high precision mechanical parts
- Textile surface treatments
- Microfluidics component treatment
- Ophthalmic (contact lens wettability)
- Plastic treatment before printing or painting processes
- Sterilization of medical equipment
- Dental implant cleaning treatment

Two versions of the Plasma Matrix are currently available:

- Plasma Matrix Plus with 2.5 liters SS vacuum process chamber, two gas inlets and manual inductive matching network with up to 200 Watt RF 13.56 MHz generator
- Super Plasma matrix with 40 liters SS vacuum process chamber, two gas inlets and a full capacitive auto matching network with up to 300 Watt RF 13.56 MHz generator

