



PLASMA POWER SUPPLY

MOST ADVANCED SURFACE TECHNOLOGY
PLASMA TEC: DC – UNIPOLAR – BIPOLAR – ARC – BIAS



**J. Schneider
Elektrotechnik**



PLASMA POWER SUPPLY | PLASMA TEC

SERIES OVERVIEW

THE WAY TO DEFECT FREE PROCESSING

The **PLASMA TEC**-Series is a highly reliable, primary switch-mode power supply product line. It reveals improved process technology for thin film plasma applications. With this state of the art water-cooled power supplies J. Schneider offers different application dedicated systems for vacuum process technologies.

PLASMA TEC advantages at a glance

- Current source power supplies for best arc handling
- Most sophisticated, flexible and adjustable arc management with extremely low passive output energy and a high output power density
- Available in a wide output power range from 3 to 20 kW
- Output power up to 200 kW in parallel connections

IDEAL FOR DIVERSE COATING APPLICATIONS

PLASMA TEC power supplies are ideal for vacuum coating processes like:

- Hard and decorative coatings
- Architectural / industrial glass
- Flat-panel, semiconductor, data-storage, optical-, tribological- and solar applications

FOR MAGNETRON SPUTTERING DEPOSITION, PECVD PROCESSING AND PLASMA TREATMENT

PLASMA TEC DC

- DC output voltage
- For planar or rotatable targets
- Ideal decoration coating [metal coating] or functional coating [hard coating, AR coating]

PLASMA TEC DCp

- DC or unipolar pulsed output voltage
- For planar or rotatable targets
- Ideal for single magnetron sputtering applications

PLASMA TEC Ap

- Unipolar pulsed output voltage or asymmetric output voltage
- Regular negative working pulses for thin film deposition
- Fully adjustable positive pulses including separate arc detection to enhance the coating properties

PLASMA TEC AC

- Symmetric bipolar DC pulsed wide range output voltage
- For dual magnetron applications
- Dedicated for defect-free, state of the art processing of metals, oxides and nitrides

PLASMA TEC Mp

- Capable of all operating modes: an improved DC operation pulse, an unipolar pulsed operation and a bipolar pulsed operation
- Virtually combines all functions in one device
- Extremely flexible power supply

FOR PULSED CATHODIC ARC PROCESSES


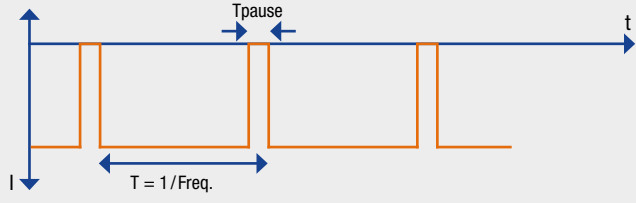
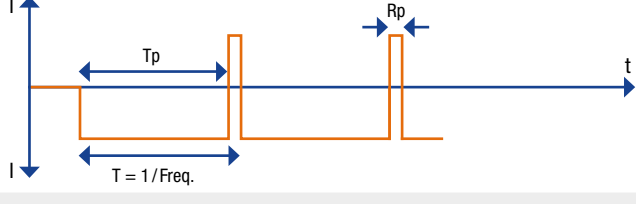
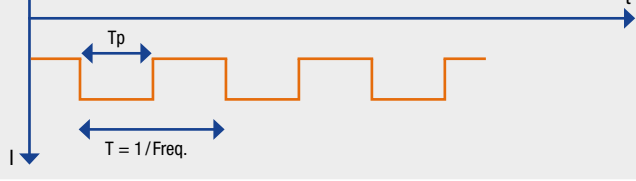
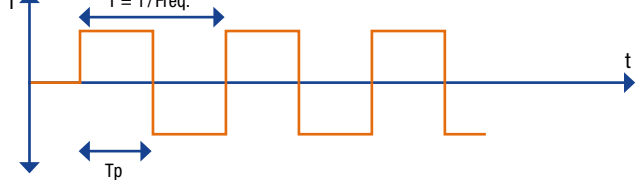
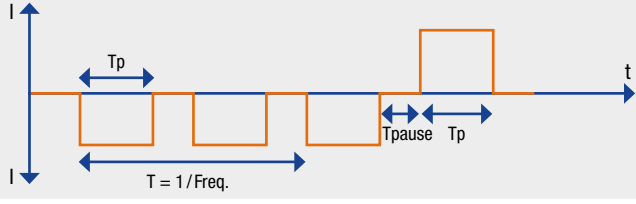
PLASMA TEC ARC

- The new DC and pulsed DC cathodic arc supply
- Opens new process windows for advanced coatings

PLASMA TEC BIAS

- Especially designed for bias applications
- Flexible adjustable arc management
- High power density
- Incomparable robustness

SELECTION TABLE

	PLASMA.TEC.DC	PLASMA.TEC.DCp	PLASMA.TEC.Ap	PLASMA.TEC.AC	PLASMA.TEC.Mp	PLASMA.TEC.ARC	PLASMA.TEC.BIAS
	✓	✓			✓	✓	✓
		✓	✓		✓	✓	✓
			✓				✓
						✓	
				✓	✓		✓
					✓		
Parallel switched or synchronized mode	✓	✓	✓2	✓2	✓	✓	✓2
Interfaces: analogue / digital and RS232	✓	✓	✓	✓	✓	✓	✓
Touch panel	0	0	0	0	0	0	0
Fieldbus: Profibus, EtherCat, CAN, ProfiNet	0	0	0	0	0	0	0

✓ = Standard
0 = Option

IDEAL FOR DECORATIVE OR FUNCTIONAL COATING

PLASMA^{TEC} DC: DC POWER SUPPLY

The **PLASMA^{TEC} DC** is a switch-mode DC power supply for PVD. Due to the CFC (Current Fed Converter) technology the output is a true current source, the most sophisticated solution for defect-free plasma processing.

The device delivers DC output current / voltage. It is available with 5, 10 or 20 kW. In parallel mode the power can increase up to 200 kW. Digital regulation of current, voltage and power reaches most accurate values.

The **PLASMA^{TEC} DC** provides high power density and great robustness, extremely low stored output energy and a sophisticated, flexible, adjustable arc management.

- Optimized for defect-free processing for state of the art thin film technologies
- Compact design: up to 20 kW in 3 HU
- Water-cooled
- Arc management configurable
- Micro arc suppression



TECHNICAL DATA

PRODUCT NAME	PLASMA TEC DC 0k86k2 [5 kW]	PLASMA TEC DC 0k812k [10 kW]	PLASMA TEC DC 0k825k [20 kW]	PLASMA TEC DC 1k05k0 [5 kW]	PLASMA TEC DC 1k010k [10 kW]	PLASMA TEC DC 1k020k [20 kW]
ARTICLE NUMBER	NDCR2014F01001	NDCR2016F01001	NDCR2018F01001	NDCR2014F01002	NDCR2016F01002	NDCR2018F01002
MAINS						
Input voltage	400 V AC +/- 10 %			400 V AC +/- 10 %		
Nominal frequency	50 / 60 Hz			50 / 60 Hz		
Max. input current	10 A	20 A	40 A	10 A	20 A	40 A
OUTPUT						
Adjustable output voltage	0 – 800 V			0 – 1000 V		
Nominal output voltage (at max.power) [Vav]	400 – 800 V			400 – 1000 V		
Nominal output power [kW]	5 kW	10 kW	20 kW	5 kW	10 kW	20 kW
Nominal output current [Aav]	12.5 – 6.25 A	25 – 12.5 A	50 – 25 A	12.5 – 5 A	25 – 10 A	50 – 20 A
Max. ignition voltage [Vig]	1400			1400		
SPECIAL FEATURES						
Connection in parallel	Up to 10 units			Up to 10 units		
Synchronization	Up to 20 units			Up to 20 units		
Interfaces (optional interfaces see page 18)	I/O interface / RS232 interface			I/O interface / RS232 interface		
Dimensions (h x w x d)	133.35 x 482.6 x 600 (725 plug included) mm 3HU x 19" x 600 mm			133.35 x 482.6 x 600 (725 plug included) mm 3HU x 19" x 600 mm		

BACK VIEW



5 kW and 10 kW



20 kW

OUTPUT



IDEAL FOR SINGLE MAGNETRON SPUTTERING APPLICATIONS

PLASMA TEC DCp: UNIPOLAR PULSED DC POWER SUPPLY

The **PLASMA TEC DCp** is the unipolar pulsed DC power supply in the **PLASMA TEC** series. It is also a true current source and uses the Current Fed Converter (CFC) technology. The best way for defect-free plasma processing. The supply could deliver a DC or an unipolar pulsed DC with an output frequency of 76 kHz. The pulse on-time could be adjusted from 1 μ sec up to 12.2 μ sec. The power supply is available with 5, 10 or 20 kW. In parallel mode it can reach up to 200 kW. Current, voltage and power are very precisely digitally regulated. The **PLASMA TEC DCp** convinces with its high power density and great robustness, extremely low stored output energy and the flexible, adjustable arc management.

- Optimized for defect-free processing for state of the art thin film technologies
- Compact design: up to 20 kW in 3 HU
- Extremely low internal stored energy (\ll 3 mJ / 10 kW)
- Water-cooled
- Arc management configurable
- Micro arc suppression



TECHNICAL DATA

PRODUCT NAME	PLASMA TEC DCp 0k86k2 [5 kW]	PLASMA TEC DCp 0k812k [10 kW]	PLASMA TEC DCp 0k825k [20 kW]	PLASMA TEC DCp 1k05k0 [5 kW]	PLASMA TEC DCp 1k010k [10 kW]	PLASMA TEC DCp 1k020k [20 kW]
ARTICLE NUMBER	NDCR1014F01001	NDCR1016F01001	NDCR1018F01001	NDCR1014F01002	NDCR1016F01002	NDCR1018F01002
MAINS						
Input voltage	400 V AC +/- 10 %			400 V AC +/- 10 %		
Nominal frequency	50 / 60 Hz +/- 5 %			50 / 60 Hz +/- 5 %		
Max. input current	10 A	20 A	32 A	10 A	20 A	32 A
OUTPUT						
Adjustable output voltage	0 – 800 V			0 – 1000 V		
Nominal output voltage (at max.power) [Vav]	400 – 800 V			400 – 1000 V		
Voltage derating in pulse operation	Average voltage value = 800 V x pulse duration [us]/10us s			Average voltage value = 800 V x pulse duration [us]/10us s		
Frequency of output voltage	76.923 kHz			76.923 kHz		
Adjustable pulse on-time	1 µsec ... 12.2 µsec			1 µsec ... 12.2 µsec		
Nominal output power [kW]	5 kW	10 kW	20 kW	5 kW	10 kW	20 kW
Nominal output current [Aav]	12.5 – 6.25 A	25 – 12.5 A	50 – 25 A	12.5 – 5 A	25 – 10 A	50 – 20 A
Max. ignition voltage [Vig]	1400			1400		
SPECIAL FEATURES						
Connection in parallel	Up to 10 units			Up to 10 units		
Synchronization	Up to 20 units			Up to 20 units		
Interfaces (optional interfaces see page 18)	I/O interface / RS232 interface			I/O interface / RS232 interface		
Dimensions (h x w x d)	133.35 x 482.6 x 600 (725 plug included) mm 3HU x 19" x 600 mm			133.35 x 482.6 x 600 (725 plug included) mm 3HU x 19" x 600 mm		

BACK VIEW

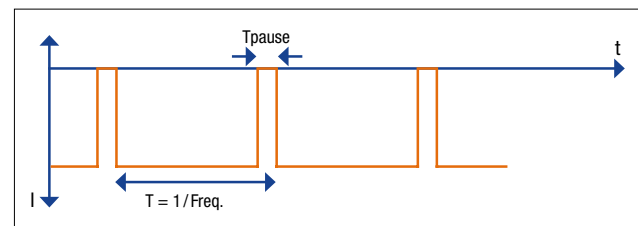
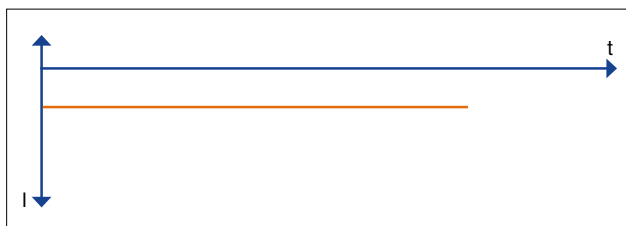


5 kW and 10 kW



20 kW

OUTPUT



ADJUSTABLE POSITIVE PULSES FOR ENHANCED COATING PROPERTIES

PLASMA^{TEC} Ap: ACTIVE PULSED DC POWER SUPPLY

The **PLASMA^{TEC} Ap**, the unipolar pulsed DC power supply is a switch-mode power supply for particularly demanding arc-sensitive processes. Like the other **PLASMA^{TEC}** devices it is a true current source using CFC-technology.

The **PLASMA^{TEC} Ap** alternatively provides a DC or an unipolar pulsed DC current / voltage at an output frequency of 76 kHz. Only the **PLASMA^{TEC} Ap** has an optional and fully active adjustable reverse pulse mode with arc detection.

The power supply is available with 6 and 12 kW. In parallel mode the 12 kW unit can increase the power up to 24 kW. The digital regulated input of current, voltage and power makes it very precise.

Like other **PLASMA^{TEC}** power supplies the **PLASMA^{TEC} Ap** has high power density, extremely low stored output energy and a sophisticated, flexible, adjustable arc management. Its great robustness makes it ideal for industrial applications or research.

- Optimized for defect-free processing, for state of the art thin film technologies
- Compact design: up to 12 kW in 3 HU
- Active adjustable reverse pulsing
- Extremely low internal stored energy ($\ll 3$ mJ / 12 kW)
- Water-cooled



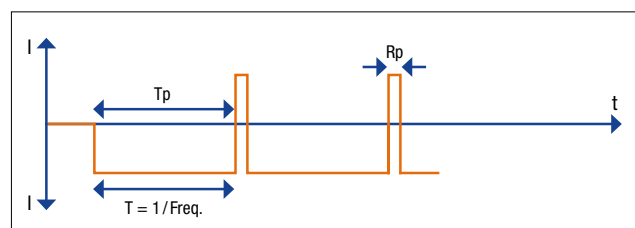
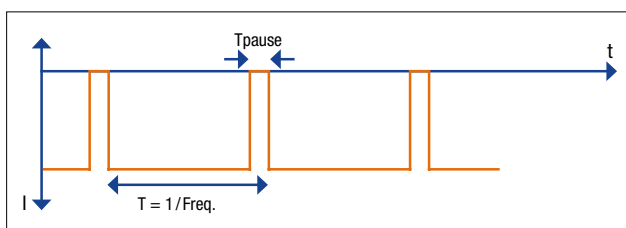
TECHNICAL DATA

PRODUCT NAME	PLASMA ^{TEC} Ap 1k06k0 [6 kW]	PLASMA ^{TEC} Ap 1k012k [12 kW]
ARTICLE NUMBER	NDCR1702F01001	NDCR1703F01001
MAINS		
Input voltage	3 x 400 V AC +/- 10 %	
Nominal frequency	50 / 60 Hz +/- 5 %	
Max. input current	12 A	23 A
OUTPUT		
Adjustable output voltage	0 – 1000 V	
Nominal peak output voltage	500 – 1000 V	
Cycle duration	13 µsec	
Frequency of the output voltage [kHz]	76.923 kHz	
Negative pulse (Power pulse) $\hat{=}$ Tp		
Control Mode	U, I, P	
Pulse width	Adjustable 1.0... 11.5 µsec	
Nominal pulsed output current	12 A at 500 V 6 A at 1000 V	24 A at 500 V 12 A at 1000 V
Nominal pulsed output power	6 kW	12 kW
Positive pulse (Reverse pulse) $\hat{=}$ Rp		
Control Mode	U, P	
Pulse width	Adjustable 0.5... 11.0 µsec	
Nominal pulsed output current	12 A at 500 V 6 A at 1000 V	
Nominal pulsed output power	6 kW	
Ignition voltage [Vig]	1200 ... 1400	
Rise up time of ignition voltage	< 1 µsec / kV	
Arc recognition	< 1 µsec	
Passive arc energy	<< 3 mJ	
SPECIAL FEATURES		
Connection in parallel	Up to 2 units	
Synchronization	Up to 20 units	
Interfaces (optional interfaces see page 18)	I/O interface / RS232 interface	
Dimensions (h x w x d)	133.35 x 482.6 x 600 (725 plug included) mm 3HU x 19" x 600 mm	

BACK VIEW



OUTPUT



PREMIUM CHOICE FOR DUAL MAGNETRON APPLICATIONS

PLASMA^{TEC} AC: BIPOLAR PULSED DC POWER SUPPLY

The **PLASMA^{TEC} AC** is a symmetric bipolar pulsed DC power supply for PVD and PECVD. The CFC technology in the switch-mode power supply makes it a true current source, the most sophisticated solution for perfect plasma processing.

The **PLASMA^{TEC} AC** delivers a bipolar output current with an output frequency of 38.46 kHz. The pulse duration can be selected from 1 μ sec to 12.7 μ sec. This enables an ultra wide range duty cycle from 7.6 to 97.7 %. The digital regulation of current, voltage and power ensures most accurate values.

Internal tap setting enables a flexible, wide output voltage range. The **PLASMA^{TEC} AC** is ideal for dual magnetron applications.

- Optimized for defect-free processing, for state of the art thin film technologies
- Compact design
- 12 kW from 450 V up to 2800 V
- Inherent current source characteristic, that ensures no current overshoot by an arc
- Extremely low internal stored energy
- Water-cooled



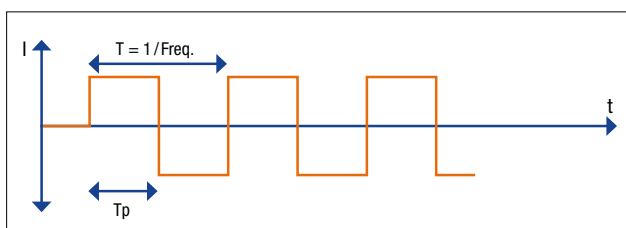
TECHNICAL DATA

PRODUCT NAME	PLASMA TEC AC 0k86k2 [5 kW]	PLASMA TEC AC 0k812k [10 kW]	PLASMA TEC AC 0k825k [20 kW]	PLASMA TEC AC 2k84k3 [12 kW]	PLASMA TEC AC 1k86k5 [12 kW]	PLASMA TEC AC 2k07k3 [15 kW]
ARTICLE NUMBER	NACR1620F01001	NACR1621F01001	NACR1622F01001	NACR1325F01001	NACR1326F01001	NACR1135F01001
MAINS						
Input voltage	3 x 400 V AC +/- 10 %					
Nominal frequency	50 / 60 Hz +/- 5 %					
Max. input current	10 A	20 A	32 A	25 A	25 A	30 A
OUTPUT						
Adjustable output voltage	0 – 800 V	0 – 800 V	0 – 800 V	0 – 2800 V	0 – 1800 V	0 – 2000 V
Nominal output voltage [Vav] TAP 1 TAP 2 TAP 3	400 – 800 V	400 – 800 V	400 – 800 V	450 – 2800 V 450 – 1150 V 870 – 2200 V 1100 – 2800 V	360 – 1800 V 360 – 920 V 550 – 1300 V 750 – 1800 V	650 – 2000 V 650 – 1000 V 950 – 1400 V 1300 – 2000 V
Frequency of the output voltage [kHz]	38.46 kHz					
Adjustable pulse on-time \triangleq Tp	1 – 12.2 μ sec	1 – 12.2 μ sec	1 – 12.2 μ sec	1 – 12.7 μ sec	1 – 12.7 μ sec	1 – 12.7 μ sec
Nominal output power	5 kW	10 kW	20 kW	12 kW	12 kW	15 kW
Nominal output current [Aav] TAP 1 TAP 2 TAP 3	12,5 – 6,25 A	25 – 12,5 A	50 – 25 A	26 – 4,3 A 26 – 10,4 A 13,5 – 5,5 A 10,6 – 4,3 A	32,5 – 6,5 A 32,5 – 12,7 A 21,3 – 9,0 A 15,6 – 6,5 A	22,5 – 7,3 A 22,5 – 14,6 A 15,4 – 10,4 A 11,25 – 7,3 A
Ignition voltage [Vig] TAP 1 TAP 2 TAP 3	1400 V	1400 V	1400 V	2550 V 3550 V 4200 V	1350 V 1800 V 2700 V	1250 V 1780 V 2540 V
Rise up time of ignition voltage	< 1 μ sec / kV					
Arc recognition	< 1 μ sec					
Passive arc energy	<< 3 mJ					
SPECIAL FEATURES						
Connection in parallel	No	Up to 2 units	Up to 2 units	Up to 2 units	Up to 2 units	Up to 2 units
Synchronization	No	Up to 2 units	Up to 2 units	Up to 2 units	Up to 2 units	Up to 2 units
Interfaces (optional interfaces see page 18)	I/O interface / RS232 interface					
Dimensions (h x w x d)	133.35 x 482.6 x 600 (725 plug included) mm 3HU x 19" x 600 mm					

BACK VIEW



OUTPUT



MOST FLEXIBLE IN THE SERIES

PLASMA^{TEC} Mp: DC, UNIPOLAR + BIPOLAR PULSED

The **PLASMA^{TEC} Mp** is the most flexible power supply in the **PLASMA^{TEC}** series. It provides multiple pulse shapes, an improved DC, unipolar pulse or bipolar pulse output current / voltage. These power supplies are specially developed for plasma processes up to 800 V. In the range of 400 to 800 V the full output power is available.

In DC mode the improved DC output current / voltage reduces the arc tendency compared to standard DC.

In unipolar pulse mode the output frequency is 76 kHz. The pulse duration can be selected from 1 to 11 µsec. This leads to a wide range duty cycle from 7.6 to 85 %

In bipolar pulse mode the output frequency amounts to 38 kHz. The pulse duration can be varied from 1 to 11 µsec which results in a wide range duty cycle from 7.6 to 85 %. Positive and negative pulses have the same output voltage. Their number is adjustable from 1 to 255. The **PLASMA^{TEC} Mp** units are available with 5 or 10 kW. In parallel mode 100 kW are possible with up to 10 devices.

Like the other **PLASMA^{TEC}** power supplies the **PLASMA^{TEC} Mp** has high power density, extremely low stored output energy and a sophisticated, flexible, adjustable arc management. Its great robustness makes it ideal for industrial applications or research.

- Optimized for defect-free processing
- For state of the art thin film technologies
- Compact design
- Inherent current source characteristic, that ensures low current overshoot by an arc
- Extremely low internal stored energy



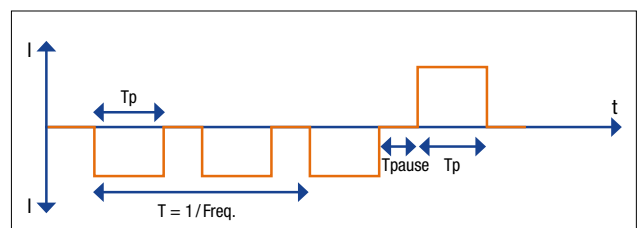
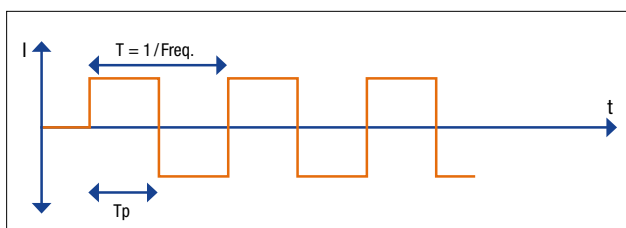
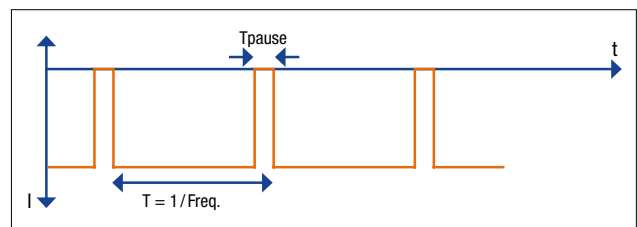
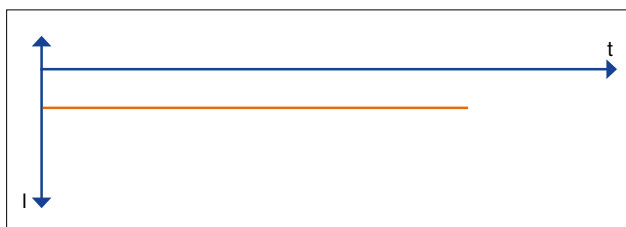
TECHNICAL DATA

PRODUCT NAME	PLASMA ^{TEC} Mp 0k83k7 [3 kW]	PLASMA ^{TEC} Mp 0k86k2 [5 kW]	PLASMA ^{TEC} Mp 0k812k [10 kW]
ARTICLE NUMBER	NDCR1306F01001	NDCR1015F01001	NDCR1017F01001
MAINS			
Input voltage	3 x 400 V AC +/- 10 %		
Nominal frequency	50 / 60 Hz +/- 5 %		
Max. input current	10 A	12 A	20 A
OUTPUT			
Nominal output voltage [Vav]	400 – 800 V		
Frequency of the output voltage [kHz]	76.923 kHz		
Nominal output power [kW]	3 kW	5 kW	10 kW
Nominal output current [Aav]	7.5 – 3.75 A	12.5 – 6.25 A	25 – 12.5 A
Max. ignition voltage [Vig]	1200 ... 1400 V (depending on mains input voltage)		
Rise up time of ignition voltage	< 1 µsec / kV		
Arc recognition	< 1 µsec		
Passive arc energy	<< 3 mJ		
SPECIAL FEATURES			
Connection in parallel	Up to 10 units		
Synchronization	Up to 20 units		
Interfaces (optional interfaces see page 18)	I/O interface / RS232 interface		
Dimensions (h x w x d)	133.35 x 482.6 x 600 (725 plug included) mm 3HU x 19" x 600 mm		

BACK VIEW



OUTPUT



“CLOSE TO DROPLET-FREE” ARC PROCESSING

PLASMA TEC ARC: PULSED CATHODIC ARC SUPPLY

The **PLASMA TEC ARC** is a high power switch-mode power supply product line. The proven CFC (Current Fed Converter) technology makes it a true current source. The **PLASMA TEC ARC** series is specially designed for “close to droplet-free” pulsed cathodic arc processes. The devices provide either straight DC or pulsed DC output current.

In pulsed operation the base current, the peak current and also the duty cycle can be set in a wide range: 1 to 99 % and the frequency 1 to 250 Hz.

- Optimized for “lowest droplet” arc / pulsed arc processing
- Compact design
- 12 kW up to 400 A
- Inherent current source characteristic, that insures stable arc current “CFC“
- Low stored energy
- Advanced pulsing capability (multilevel pulsing)
- Precise current control with low overshoot



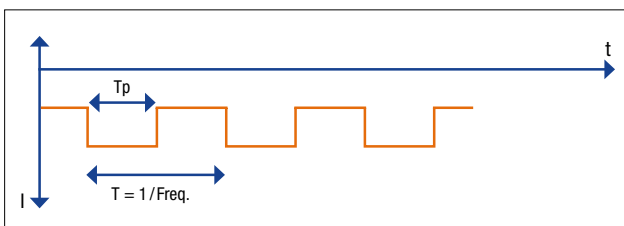
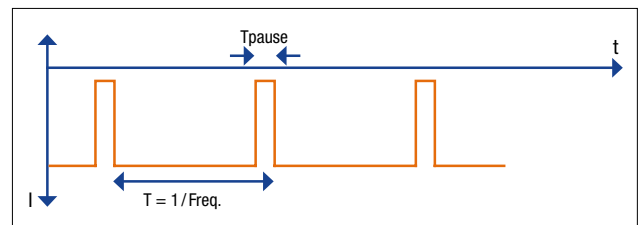
TECHNICAL DATA

PRODUCT NAME	PLASMA ^{TEC} ARC 030200 [6kW]	PLASMA ^{TEC} ARC 030400 [12 kW]	PLASMA ^{TEC} ARC 080200 [16 kW]
ARTICLE NUMBER	NACR1436F01001	NACR1437F01001	NACR1439F01001
MAINS			
Input voltage	3 x 400 V AC +/- 10 %		
Nominal frequency	50 / 60 Hz +/- 5 %		
Max. input current	25 A	25 A	30 A
OUTPUT DC MODE			
Nominal output voltage [Vav]	30 V DC (60 V open voltage)	30 V DC (60 V open voltage)	80 V DC (140 V open voltage)
Nominal output power [kW]	6 kW @ 30 V	12 kW @ 30 V	16 kW @ 80 V
Nominal output current [Aav]	200 A	400 A	200 A
OUTPUT PULSED MODE			
Nominal output voltage [Vav]	30 V (60 V open voltage)	30 V (60 V open voltage)	80 V (140 V open voltage)
Nominal output power [kW]	6 kW	12 kW	16 kW
Nominal output base current [Aav]	0 – 200 A	0 – 400 A	0 – 200 A
Nominal output peak current [Aav]	Base current – 200 A	Base current – 400 A	Base current – 200 A
Max. ignition voltage [Vig]	60 V (depending on mains input voltage)		140 V
Pulsing frequency	DC, 1 Hz to 250 Hz		
Duty cycle \triangleq Tp	1 % to 99 %		
Minimum pulse length	500 μ sec		
Interfaces (optional interfaces see page 18)	I/O interface / RS232 interface		
Dimensions (h x w x d)	133.35 x 482.6 x 600 (725 plug included) mm 3HU x 19" x 600 mm		

BACK VIEW



OUTPUT



BETTER FILM DENSITY AND ADHESION

PLASMA TEC BIAS: DC + UNIPOLAR OR BIPOLAR PULSE

The **PLASMA TEC BIAS** is a switch-mode power supply product line with state of the art CFC technology. These power supplies are specially developed for bias applications and deliver a stable DC, unipolar or bipolar pulsed output voltage from 20 up to 1000 V.

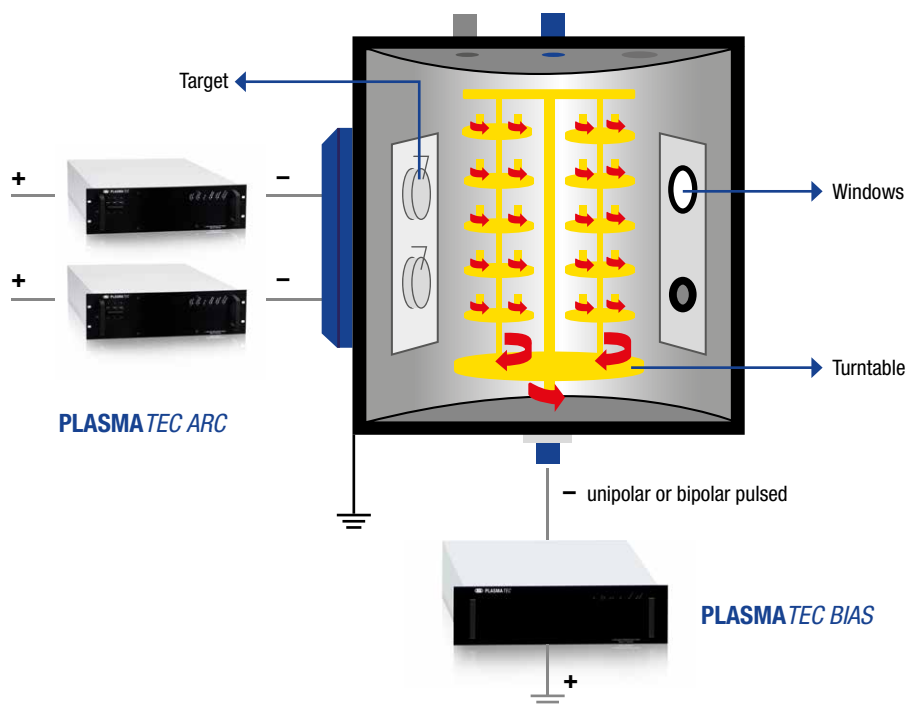
At unipolar pulsed mode the device provides an output frequency of 1 to 30 kHz. In bipolar pulsed mode the output frequency is adjustable from 1 to 15 kHz. The duty cycle from 1 to 95 % of the frequency can be flexibly adjusted via interface.

Positive and negative pulses have the same output voltage but the duty cycle can be adjusted separately. The device is available with 7.5 or 15 kW. In parallel mode the power can be increased.

The **PLASMA TEC BIAS** supplies feature a sophisticated flexible adjustable arc management, a high power density and an incomparable robustness.

- Optimized for pulsed ion etching
- Better film density and adhesion
- Adaptable to a wide range of process requirements
- Water-cooled
- Multiple units combinable for high power requirements
- High performance DSP regulator

TYPICAL APPLICATION



TECHNICAL DATA

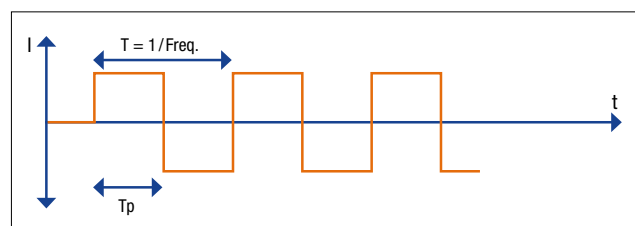
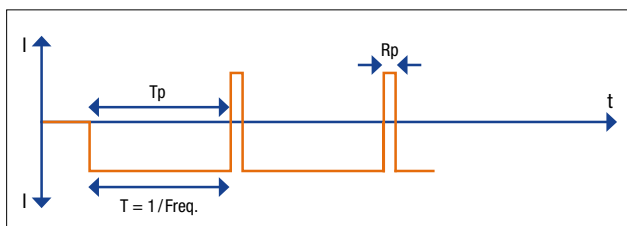
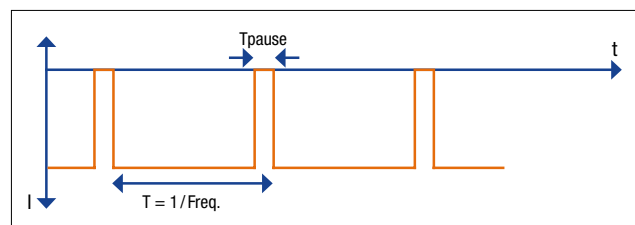
PRODUCT NAME	PLASMA ^{TEC} BIAS 1k07k5 [7.5 kW]	PLASMA ^{TEC} BIAS 1k015k [15 kW]
ARTICLE NUMBER	NDCR1726F01002	NDCR1727F01002
MAINS		
Input voltage	3 x 400 V AC +/- 10 %	
Nominal frequency	50 / 60 Hz +/- 5 %	
Max. input current	34 A	34 A
OUTPUT		
Nominal output voltage [Vav]	300 – 1000 V DC	300 – 1000 V DC
Nominal output power [kW]	7.5 kW	15 kW
Nominal output current [Aav]	25 – 7.5 A	50 – 15 A
Frequency of output voltage	DC 1 kHz to 30 kHz unipolar pulsed 1 kHz to 15 kHz unipolar pulsed	
Duty cycle in pulsed mode	see table below	
Connection in parallel	Up to 2 units	
Interfaces (optional interfaces see page 18)	I/O interface / RS232 interface	
Dimensions (h x w x d)	133.35 x 482.6 x 600 (725 plug included) mm 3HU x 19" x 600 mm	

BACK VIEW



DC POSITIVE OR DC NEGATIVE			
1 – 6 kHz	3 – 99 %	21 – 26 kHz	3 – 96 %
7 – 13 kHz	3 – 98 %	27 – 30 kHz	3 – 95 %
14 – 20 kHz	3 – 97 %	DC not pulsed	100 %
BIPOLAR			
Frequency	Tp Pos. pulse	Rp Neg. pulse	Pos. + neg pulse max.
1 – 2 kHz	3 – 98 %	1 – 96 %	99 %
3 – 4 kHz	3 – 97 %	1 – 95 %	98 %
5 – 6 kHz	3 – 96 %	1 – 94 %	97 %
7 – 8 kHz	3 – 95 %	1 – 93 %	96 %
9 – 10 kHz	3 – 94 %	1 – 92 %	95 %
11 – 12 kHz	3 – 93 %	1 – 91 %	94 %
13 – 14 kHz	3 – 92 %	1 – 90 %	93 %
15 kHz	3 – 91 %	1 – 89 %	92 %

OUTPUT

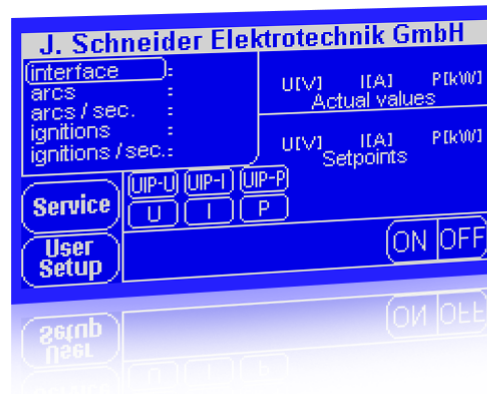


PLASMA^{TEC}: OPTIONS

OPTION 1: TOUCH PANEL IN FRONT PLATE

The touch panel makes the input of more precise settings and parameters possible and displays the current system status.

- 320 x 240 pixel touch panel with blue-white LED-backlight
- Input of voltage, current and rating
- Display of number of arcs, arcs/sec, ignitions, ignitions/sec
- Display of error messages
- Release can be issued



OPTION 2: INTERFACES

For easy communication with a PLC there are 4 different fieldbus slave modules available:

CANopen:

1 x Sub-D9 male,
up to 1 Mbit/s



PROFIBUS DP:

1 x Sub-D9 female,
DP-V1, up to 12 Mbit/s

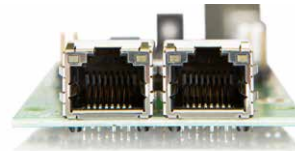


PROFINET I/O-RT:

2 x RJ45,
100 Mbit/s, Class B Slave

EtherCAT:

2 x RJ45,
100 Mbit/s, up to 1 ms cycle time



NECESSARY CHANGES AT THE ORDER NUMBER FOR THE OPTIONS

NACR1436F 01 0 01

01 = Standard Digital- / Analogue-Interface
20 = Additional PROFIBUS DP
30 = Additional CANopen
40 = Additional EtherCAT
50 = Additional PROFINET

0 = Without Touch panel in front plate
1 = With Touch panel in front plate

PLASMA^{TEC}: INPUT / OUTPUT CONNECTORS

INPUT CONNECTORS

ARTICLE NUMBER	USABLE FOR	CABLE TYP	CABLE LENTH
NDC70739F01002	PLASMA^{TEC} DC (5, 10 kW) PLASMA^{TEC} DC_p (5, 10 kW) PLASMA^{TEC} A_p PLASMA^{TEC} AC (5, 10, 12 kW) PLASMA^{TEC} M_p PLASMA^{TEC} ARC (6 kW)	non	0 meter
NDC41117F02002		Oiflex 5 x 4 mm ²	2 meter
NDC41117F04002		Oiflex 5 x 4 mm ²	4 meter
NDC41117F06002		Oiflex 5 x 4 mm ²	6 meter
NDC41117F08002		Oiflex 5 x 4 mm ²	8 meter
NDC41117F10002		Oiflex 5 x 4 mm ²	10 meter
NDC71018F01002	PLASMA^{TEC} DC_p (20 kW) PLASMA^{TEC} AC (15, 20 kW) PLASMA^{TEC} ARC (12 kW)	non	0 meter
NDC41018F02002		Oiflex 5 x 6 mm ²	2 meter
NDC41018F04002		Oiflex 5 x 6 mm ²	4 meter
NDC41018F06002		Oiflex 5 x 6 mm ²	6 meter
NDC41018F08002		Oiflex 5 x 6 mm ²	8 meter

OUTPUT CONNECTORS

ARTICLE NUMBER	USABLE FOR	CABLE TYP	CABLE LENTH
NDC70739F01001	PLASMA^{TEC} M_p	non	0 meter
NHC41117F02001		2 x RG213	2 x 2 meter
NHC41117F04001		2 x RG213	2 x 4 meter
NHC41117F06001		2 x RG213	2 x 6 meter
NHC41117F08001		2 x RG213	2 x 8 meter
NDC71016F01001	PLASMA^{TEC} DC (5–10 kW) PLASMA^{TEC} DC_p (5–10 kW)	non	0 meter
NDC41016F02001		2 x H2010	2 x 2 meter
NDC41016F04001		2 x H2010	2 x 4 meter
NDC41016F06001		2 x H2010	2 x 6 meter
NDC41016F08001	2 x H2010	2 x 8 meter	
NDC71018F01001	PLASMA^{TEC} DC_p (10 kW) PLASMA^{TEC} BIAS (20 kW)	non	0 meter
NDC41018F02001		2 x Ecoflex 15	2 x 2 meter
NDC41018F04001		2 x Ecoflex 15	2 x 4 meter
NDC41018F06001		2 x Ecoflex 15	2 x 6 meter
NDC41018F08001	2 x Ecoflex 15	2 x 8 meter	
NAC71325F01001	PLASMA^{TEC} AC (5, 10, 12, 15 kW) PLASMA^{TEC} A_p	non	0 meter
NAC41325F02001		2 x RG213	2 x 2 meter
NAC41325F04001		2 x RG213	2 x 4 meter
NAC41325F06001		2 x RG213	2 x 6 meter
NAC41325F08001		2 x RG213	2 x 8 meter



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