

# HPS

## DIGITAL CONTROLLABLE AC/DC HIGH VOLTAGE POWER SUPPLIES

Out: 1 kV - 100 kV | 300 W - 10 kW | Ripple: best:  $< 1 \cdot 10^{-4} \cdot V_{nom}$  | up to 93% eff.

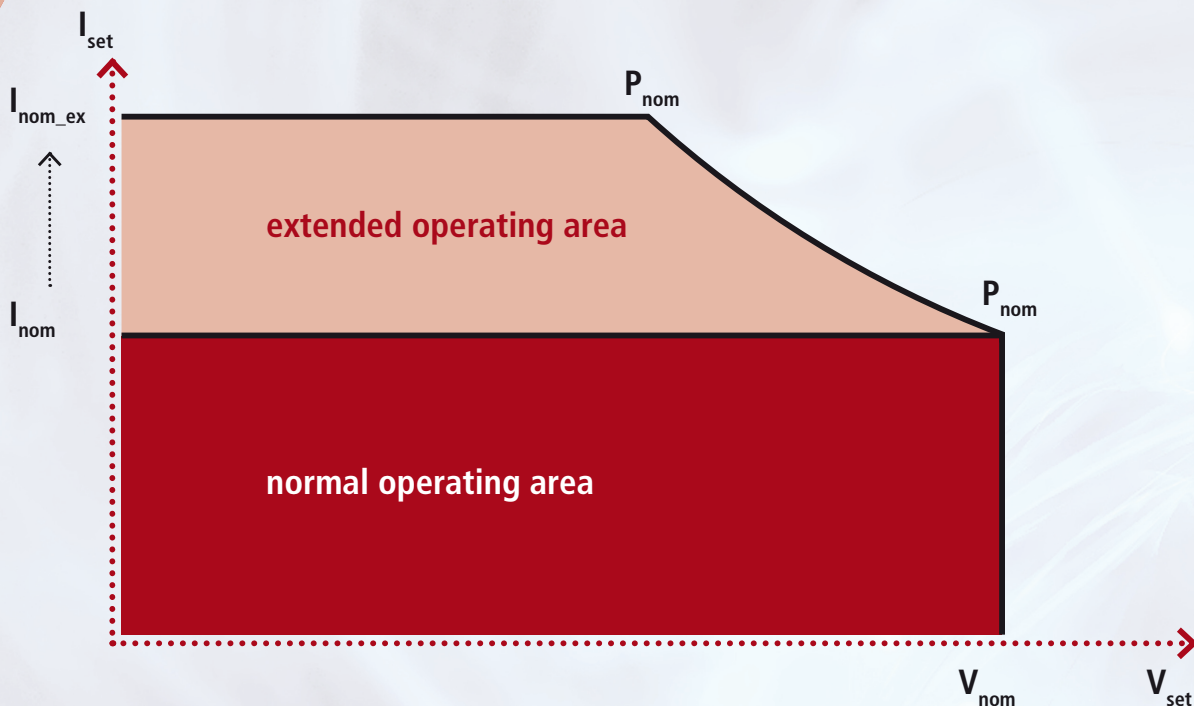


AC/DC

- AIO
- DIO
- CUSTOM

- ▶ 300 W - 10 kW / 1kV - 100 kV versions
- ▶ 19" rack mountable or compact box version
- ▶ best control characteristics
- ▶ multiple interface options
- ▶ capacitor charger option (option CLD )
- ▶ ultrafast ARC management (optional ARC/ARCpro)
- ▶ very low ripple and noise, very low EMI
- ▶ parallel operation for power increase

HPS devices are digitally controlled AC driven high voltage power supplies with high power density at best output characteristics. The processor controlled supplies can flexibly be adapted to any kind of application by configuring many options. PWM controlled output parameters, small ripple and noise and stored energy, up to 93% efficiency and almost loss free switching of semiconductors makes HPS devices the most advanced AC/DC HV power supply for industrial and research applications.



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Comparison HPS with and without Extended Operating Area Option (EOA)

SPECIFICATIONS / SPEZIFIKATION							
	HPS COMPACT	HPS 300 W	HPS 800 W	HPS 1.5 kW	HPS 3 kW	HPS 6 kW	HPS 10 kW
Power	350 W	300 W	800 W	1,500 W	3,000 W	6,000 W	10,000 W
Polarity	factory fixed, positive or negative						
Ripple and noise [f > 10 Hz]	$< 2 \cdot 10^{-3} \cdot V_{nom}$	$< 1 \cdot 10^{-4} \cdot V_{nom}$ [V <sub>nom</sub> ≤ 8 kV] $< 5 \cdot 10^{-4} \cdot V_{nom}$ [V <sub>nom</sub> > 8 kV]		$< 3 \cdot 10^{-3} \cdot V_{nom}$ **	$< 5 \cdot 10^{-3} \cdot V_{nom}$ **		$< 9 \cdot 10^{-3} \cdot V_{nom}$ **
Stability	0.02 %		0.02 %*		0.05 %*		0.05 %*
Voltage regulation [ $\Delta V_{out} / \Delta V_{in}$ ]	0.02 % [V <sub>out</sub> ≥ 5 V]		0.01 % [V <sub>out</sub> ≥ 5 V]		0.01 % [V <sub>out</sub> ≥ 5 V]		0.01 % [V <sub>out</sub> ≥ 5 V]
Temperatur coefficient	$< 2 \cdot 10^{-4} / K$						
Supply voltage	85 - 264 VAC with PFC			170 VAC - 264 VAC with PFC		3 x 400 VAC ± 10%	
Efficiency	up to 85%			up to 93%		up to 93%	
Switching frequency	30 - 70 kHz			80 - 130 kHz	70 - 90 kHz	60 - 80 kHz	
Set / monitor voltage	0 - 5 V   opt. 0 - 10 V						
Protection	overload, ARC and short circuit protected, INTERLOCK, INHIBIT, overvoltage/overtemp protection						
ARC Management	ARC			ARCpro		ARCpro	
Interfaces	USB, CAN, opt.: IEEE488.2, Ethernet, RS232, AIO isolated			USB, AIO isolated, opt: IEEE 488.2, Ethernet, RS232, CAN, SPS (0-10V)			
Filament supply	not available			optional		optional	
Case	metal box	19" rack mountable			19" rack mountable		
Dimensions (L/W/H)	280/254/107 mm	410 mm / 19" / 1U		410-550 mm / 19" / 2-4U		500 mm/ 19" / 4U	
* for 8h, after 0.5h warmup   **   option VLN: $< 5 \cdot 10^{-4} \cdot V_{nom}$ (not available for all configurations)							

### CONFIGURATIONS / KONFIGURATIONEN

MODEL	V <sub>nom</sub>	I <sub>nom</sub>	HEIGHT	HV CONNECTOR
<b>HPS COMPACT</b>				
HPx 10 357 y	1 kV	350 mA	107 mm	GES HB11
HPx 20 177 y	2 kV	175 mA	107 mm	GES HB11
HPx 30 127 y	3 kV	120 mA	107 mm	GES HB11
HPx 50 706 y	5 kV	70 mA	107 mm	GES HB11
HPx 80 456 y	8 kV	45 mA	107 mm	GES HB11
HPx 100 356 y	10 kV	35 mA	107 mm	GES HB11
HPx 150 236 y	15 kV	23 mA	107 mm	GES HB31
HPx 200 186 y	20 kV	18 mA	107 mm	GES HB31
HPx 250 146 y	25 kV	14 mA	107 mm	GES HB31
HPx 300 126 y	30 kV	12 mA	107 mm	GES HB31
HPx 400 905 y	40 kV	9 mA	107 mm	E70
HPx 500 705 y	50 kV	7 mA	107 mm	E70
HPx 600 605 y	60 kV	6 mA	107 mm	E70
HPx 700 505 y	70 kV	5 mA	107 mm	E70
<b>HPS 19" - 300 W</b>				
HPx 10 307 y	1 kV	300 mA	1U	SHV
HPx 20 157 y	2 kV	150 mA	1U	SHV
HPx 30 107 y	3 kV	100 mA	1U	SHV
HPx 40 756 y	4 kV	75 mA	1U	SHV
HPx 60 506 y	6 kV	50 mA	1U	SHV
HPx 80 356 y	8 kV	35 mA	1U	SHV
HPx 120 256 y	12 kV	25 mA	1U	LEMO ERA1Y416.CLL
HPx 150 206 y	15 kV	20 mA	1U	LEMO ERA1Y416.CLL
HPx 200 156 y	20 kV	15 mA	1U	LEMO ERA3Y425.CLL
HPx 300 106 y	30 kV	10 mA	1U	LEMO ERA3Y425.CLL
<b>HPS 19" - 800 W</b>				
HPx 10 807 y	1 kV	800 mA	1U	SHV
HPx 20 407 y	2 kV	400 mA	1U	SHV
HPx 30 257 y	3 kV	250 mA	1U	SHV
HPx 40 207 y	4 kV	200 mA	1U	SHV
HPx 60 137 y	6 kV	130 mA	1U	SHV
HPx 80 107 y	8 kV	100 mA	1U	SHV
HPx 120 656 y	12 kV	65 mA	1U	LEMO ERA1Y416.CLL
HPx 150 506 y	15 kV	50 mA	1U	LEMO ERA1Y416.CLL
<b>HPS 19" - 1.5 kW</b>				
HPx 10 158 152	1 kV	1.5 A	2U	SHV
HPx 20 757 152	2 kV	750 mA	2U	SHV
NEW HPx 30 507 152	3 kV	500 mA	2U	SHV
HPx 40 387 152	4 kV	380 mA	2U	SHV
HPx 80 197 152	8 kV	200 mA	2U	LEMO PSA.3S.CTA.C62
HPx 100 157 152	10 kV	150 mA	2U	LEMO PSA.3S.CTA.C62
HPx 120 137 152	12 kV	125 mA	2U	GES HB21

### CONFIGURATIONS / KONFIGURATIONEN

MODEL	V <sub>nom</sub>	I <sub>nom</sub>	HEIGHT/DEPTH	HV CONNECTOR
HPx 150 107 152	15 kV	100 mA	2U 410 mm	GES HB21
HPx 200 756 152	20 kV	75 mA	2U 410 mm	GES HB21
HPx 300 506 152	30 kV	50 mA	3U 410 mm	GES HB40
HPx 400 386 152	40 kV	38 mA	3U 410 mm	GES HB40
HPx 500 306 152	50 kV	30 mA	3U 410 mm	GES B160
HPx 600 256 152	60 kV	25 mA	3U 410 mm	GES B160
NEW HPx 800 206 152	80 kV	20 mA	4U 550 mm	GES B1100
NEW HPx A00 156 152	100 kV	15 mA	4U 550 mm	GES B1100
<b>HPS 19" - 3 kW</b>				
HPx 10 308 302	1 kV	3 A	2U 410 mm	SHV
HPx 20 158 302	2 kV	1.5 A	2U 410 mm	SHV
NEW HPx 30 108 302	3 kV	1 A	2U 410 mm	SHV
HPx 40 757 302	4 kV	750 mA	2U 410 mm	SHV
HPx 80 387 302	8 kV	375 mA	2U 410 mm	LEMO PSA.3S.CTA.C62
HPx 120 257 302	12 kV	250 mA	2U 410 mm	GES HB21
HPx 150 207 302	15 kV	200 mA	2U 410 mm	GES HB21
HPx 200 157 302	20 kV	150 mA	2U 410 mm	GES HB21
HPx 300 107 302	30 kV	100 mA	3U 410 mm	GES HB40
HPx 400 756 302	40 kV	75 mA	3U 410 mm	GES HB40
HPx 500 606 302	50 kV	60 mA	3U 410 mm	GES B160
HPx 600 506 302	60 kV	50 mA	3U 410 mm	GES B160
NEW HPx 800 386 302	80 kV	38 mA	4U 550 mm	GES B1100
NEW HPx A00 306 302	100 kV	30 mA	4U 550 mm	GES B1100
<b>HPS 19" - 6 kW</b>				
HPx 10 608 602	1 kV	6 A	4U 500 mm	GES HB11
HPx 20 308 602	2 kV	3 A	4U 500 mm	LEMO PSA.3S.CTA.C62
NEW HPx 30 208 602	3 kV	2 A	4U 500 mm	LEMO PSA.3S.CTA.C62
NEW HPx 40 158 602	4 kV	1.5 A	4U 500 mm	LEMO PSA.3S.CTA.C62
HPx 50 128 602	5 kV	1.2 A	4U 500 mm	LEMO PSA.3S.CTA.C62
NEW HPx 60 108 602	6 kV	1 A	4U 500 mm	LEMO PSA.3S.CTA.C62
NEW HPx 80 757 602	8 kV	750 mA	4U 500 mm	LEMO PSA.3S.CTA.C62
HPx 100 607 602	10 kV	600 mA	4U 500 mm	LEMO PSA.3S.CTA.C62
HPx 200 307 602	20 kV	300 mA	4U 500 mm	GES HB21
<b>HPS 19" - 10 kW</b>				
HPx 10 109 103	1 kV	10 A	4U 500 mm	GES HB11
HPx 20 508 103	2 kV	5 A	4U 500 mm	LEMO PSA.3S.CTA.C62
NEW HPx 30 348 103	3 kV	3.4 A	4U 500 mm	LEMO PSA.3S.CTA.C62
NEW HPx 40 258 103	4 kV	2.5 A	4U 500 mm	LEMO PSA.3S.CTA.C62
HPx 50 208 103	5 kV	2 A	4U 500 mm	LEMO PSA.3S.CTA.C62
NEW HPx 60 178 103	6 kV	1.7 A	4U 500 mm	LEMO PSA.3S.CTA.C62
NEW HPx 80 138 103	8 kV	1.3 A	4U 500 mm	LEMO PSA.3S.CTA.C62
HPx 100 108 103	10 kV	1 A	4U 500 mm	LEMO PSA.3S.CTA.C62
HPx 200 507 103	20 kV	500 mA	4U 500 mm	GES HB21

### ORDER & OPTIONS / BESTELLINFORMATIONEN

OPTION	ORDER INFO	EXAMPLE
Polarity	positive: <b>x = p</b> , negative: <b>x = n</b>	HPp 10 357 05
Capacitor charger	<b>CLD</b>	
ARC management	<b>ARC</b>	
Interface options	Ethernet: <b>ETH</b>   IEEE 488: <b>IEE</b>   RS232: <b>RS2</b>	
<b>HPS COMPACT / 300 W / 800 W only options</b>		
Set / monitor voltage	0-5 V (standard): <b>y = 05</b> , 0-10 V (optional): <b>y = 10</b>	HPp 10 357 10
AIO isolated	<b>AIO</b>	
Rear HV connector (SHV only)	<b>HVR</b>	
Note: other product configurations and customizing on request		

### HPS 1.5 kW / 3 kW / 6 kW / 10 kW only options

Front panel operation with LCD	<b>FP</b>
Interface options	<b>CAN   SPS</b>
Very low noise: $< 5 \cdot 10^{-4} \cdot V_{nom}$ (*not available for all configurations)	<b>VLN</b>
ARC current limitation	<b>ACL</b>
Two HV output connectors	<b>2HC</b>
Integrated filament supply	<b>FCS</b>
Integrated magnet supply	<b>MCS</b>
Extend operating area	<b>EOA</b>

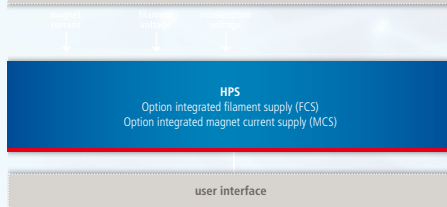
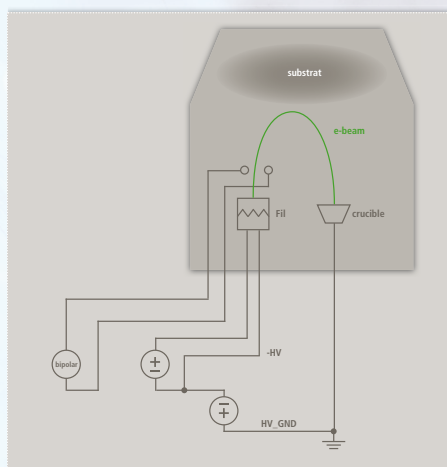
- ▶ HV supply with up to 2 integrated filament supply units and up to 2 integrated magnet current supplies for e-beam coating applications
- ▶ filament supply on internal HV potential
- ▶ all HPS features and options available
- ▶ optional front panel operation with LCD

HPS high voltage power supplies with one or two integrated filament supplies (option FCS) and integrated magnet current supplies (option MCS) are best prepared to fit major requirements in e-beam coating applications. The filament voltage is superimposed on top of the accelerating high voltage internally. This leads to following benefits:

- ▶ only one high voltage cable / connection
- ▶ less control effort
- ▶ lower system cost



10 kW HPS WITH FILAMENT AND MAGNET CURRENT SUPPLY OPTION FOR E-BEAM COATING



All in one solution

- Only one high voltage cable
- Only one high voltage connection
- Less control effort
- Lower system cost



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