

0.5kV - 30kV; 12W
REGULATED, HIGHLY STABLE
HIGH VOLTAGE POWER SUPPLIES

▪ **FEATURES**

- Precise high voltages up to 30kV at max. 12W
- Patented resonance converter technology
- Very low ripple and noise
- Very low EMI
- 3U cassette
- Modified versions available on request
- Made in Germany



The HEC modules are highly stable, analog controlled high voltage power supplies with fixed output polarity. The HEC series covers output voltages of up to 30kV in a 3U cassette. A version in a compact metal box is available too (HMC series). The maximum output power is 12W.

The HV output is brought out via an HV connector. The supply and control voltages are connected via an H15 connector. Analog I/O is provided for remote monitoring and control of output voltage and current by means of analog control voltages or potentiometers (internal reference voltage). An INHIBIT input and current and voltage limits are provided. The patented resonant converter technology guarantees high efficiency and low EMI.

Output Voltage V_{NOM}	Max. Output Current I_{NOM}	Model		Ripple / Noise $@f > 10\text{Hz}$ typ.
		Positive Polarity Output	Negative Polarity Output	
0 – 500V	20mA	HEC-0.5P20-24-#	HEC-0.5N20-24-#	10mV _{PP}
0 – 1000V	10mA	HEC-1P10-24-#	HEC-1N10-24-#	20mV _{PP}
0 – 1500V	8mA	HEC-1.5P8-24-#	HEC-1.5N8-24-#	30mV _{PP}
0 – 2000V	6mA	HEC-2P6-24-#	HEC-2N6-24-#	40mV _{PP}
0 – 3000V	4mA	HEC-3P4-24-#	HEC-3N4-24-#	60mV _{PP}
0 – 4000V	3mA	HEC-4P3-24-#	HEC-4N3-24-#	80mV _{PP}
0 – 5000V	2mA	HEC-5P2-24-#	HEC-5N2-24-#	100mV _{PP}
0 – 7000V	1.5mA	HEC-7P1.5-24-#	HEC-7N1.5-24-#	140mV _{PP}
0 – 10000V	1mA	HEC-10P1-24-#	HEC-10N1-24-#	200mV _{PP}
0 – 15000V	0.6mA	HEC-15P0.6-24-#	HEC-15N0.6-24-#	300mV _{PP}
0 – 20000V	0.5mA	HEC-20P0.5-24-#	HEC-20N0.5-24-#	400mV _{PP}
0 – 30000V	0.3mA	HEC-30P0.3-24-#	HEC-30N0.3-24-#	600mV _{PP}

#: set/monitor voltage range designator: "5" or "10" for 0-5V or 0-10V respectively

■ SPECIFICATIONS

Input Supply Voltage (V_{IN}):	24V _{DC} ± 5% (max 0.8A)		
Output Current Limit (I_{LIMIT}):	(1.2-1.5) * I_{NOM}		
Line Regulation:	0.5kV-7kV models: < 5 * 10 ⁻⁵ * V_{NOM}	($\Delta V_{OUT} / \Delta V_{IN}$)	min to max supply voltage)
	10kV-30kV models: < 1 * 10 ⁻⁴ * V_{NOM}		
Load Regulation:	0.5kV-7kV models: < 2 * 10 ⁻³ * V_{NOM}	($\Delta V_{OUT} / \Delta R_{LOAD}$)	no load to rated load)
	10kV-30kV models: < 2 * 10 ⁻⁴ * V_{NOM}		
Temperature Coefficient:	< 1 * 10 ⁻⁴ /K		
Supply / Control Connector:	DIN 41612 H15 male		
Output Connector:	0.5kV – 7kV models:	SHV	
	10kV models:	HB11	
	15kV – 20kV models:	HB21	
	30kV models:	HB31	
Control:	analog control signals: VSET, ISET, VMON, IMON 5V control inputs: INH, KILL_ENA		
Reference Voltage (REF):	option "5":	$V_{REF} = 5.0V$ (max 1mA)	
	option "10":	$V_{REF} = 10.0V$ (max 1mA)	
	This reference voltage is intended for external potentiometers to program the output voltage and/or current (connect wipers to VSET, ISET respectively)		
Voltage Setting (VSET):	$V_{VSET} = 0$ to V_{REF} results in $V_{OUT} = 0$ to $V_{NOM} \pm 1\%$ (input impedance: 1M Ω)		
Current Limit Setting (ISET):	$V_{ISET} = 0$ to V_{REF} results in $I_{LIMIT} = 0$ to $I_{NOM} \pm 1\%$ Open input results in $I_{LIMIT} = I_{NOM}$ The output current is not limited to I_{NOM} internally V_{ISET} must not exceed V_{REF} !		
Voltage Monitor (VMON)	$V_{OUT} = 0$ to V_{NOM} results in $V_{VMON} = 0$ to $V_{REF} \pm 1\%$ (output impedance: 10k Ω)		
Current Monitor (IMON)	$I_{OUT} = 0$ to I_{NOM} results in $V_{IMON} = 0$ to $V_{REF} \pm 1\%$ (output impedance: 10k Ω)		
Kill (KILL_ENA):	5V level, active High (10k Ω pulldown)		
	High:	$V_{OUT} = 0$ without ramp if signal INHIBIT is active or $I_{OUT} > I_{LIMIT}$ The output voltage stays off as long as KILL_ENA = High	
	Low or open:	V_{OUT} according to V_{VSET} or V_{ISET}	
Inhibit (INH)	5V level, active Low		
	Low:	$V_{OUT} = 0$	
	High or open:	V_{OUT} according to V_{VSET} with ramp ca. $V_{NOM} / 4s$	
Protection:	Overload, arc and output short circuit. Only one short circuit or arc event per second allowed! In case of higher arc/S.C. frequency the RMS output current must be limited to I_{NOM}		
Operating temperature:	0°C to +50°C		
Storage temperature:	-20°C to +60°C		
Dimensions:	see table		

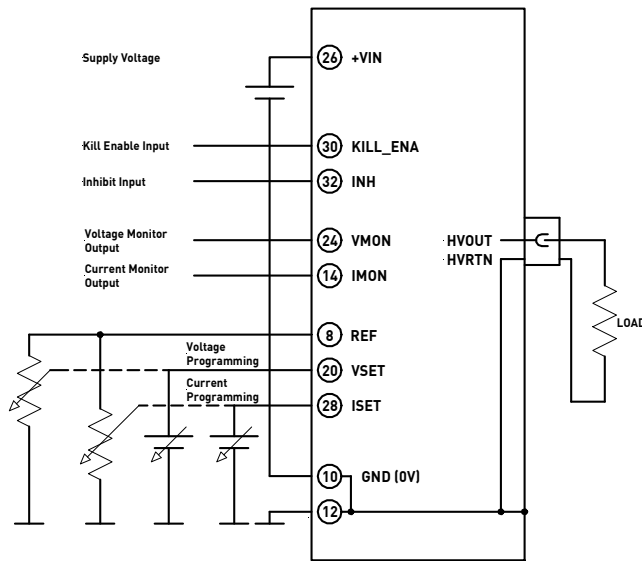
All voltages are referenced to GND

■ ORDERING INFORMATION

HEC	-	30	P	0.3	-	24	-	5
Base Part Designation		Output Voltage [kV _{DC}]	Output Polarity	Output Current [mA]		Input Supply Voltage [V _{DC}]		Set/Monitor Voltage Range [V _{DC}]

Example: HEC-30P0.3-24-5 (HEC series, 30kV, positive, 0.3mA, 24V supply, 5V reference)

CONNECTION DIAGRAM



PIN FUNCTION DESCRIPTIONS

Pin No.	Designation	Function
8	REF	Reference Voltage Output
10	GND (0V)	Power 0V (connected to pin 12)
12	GND	Signal GND (connected to pin 10)
14	IMON	Current Monitor Output
20	VSET	Voltage Programming Input
24	VMON	Voltage Monitor Output
26	+VIN	Input Supply Voltage
28	ISET	Current Programming Input
30	KILL_ENA	Kill Enable Input
32	INH	Inhibit Input

GND and HVRTN are internally connected.
The case is connected to GND.

DIMENSIONS

	Height	Width	Overall Depth
500V-7kV models	3U (128.7)	8HP (40.3)	190
10kV-30kV models	3U (128.7)	12HP (60.7)	190

Dimensions in mm

Disclaimer

The information given in this data sheet is technical data, not assured product characteristics. It has been carefully checked and is believed to be accurate; however, no responsibility is assumed for inaccuracies. The user has to ensure by adequate tests that the product is suitable for his application regarding safety and technical aspects. hivolt.de GmbH & Co. KG does not assume any liability arising out of the application or use of any product described.

Safety Advice

Design, installation and inspection of machinery and devices carrying high voltage require accordingly trained and qualified personnel. Appropriate safety rules and directives must be complied with. Improper handling of high voltage can mean severe injuries or death and may cause serious collateral damage!