

0.5kV - 30kV; 60W/80W
VERSATILE, PRECISION REGULATED
HIGH VOLTAGE POWER SUPPLIES

▪ **FEATURES**

- Precise high voltages up to 30kV at 60W/80W
- Positive or negative polarity
- Output voltage and current control
- Internal reference voltage
- Stable output voltage
- Low ripple and noise
- Low EMI
- Capacitor charger option (-C)
- ARC management option (-ARC)
- Patented resonance converter technology
- 3U/12HP cassette
- Modified versions available on request
- Made in Germany



HEE modules are versatile, precise and stable analog controlled high voltage power supplies. The HEE series covers output voltages of up to 30kV (the >10kV models are preliminary) in a 3U/12HP cassette. A version in a compact metal box is available too (HME series). The maximum output power is 60W, and 80W on selected models.

The HV output is brought out via SHV, HB11, HB21 or HB31 connectors, depending on the output voltage. 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). Inhibit, Kill Enable and remote ON inputs are provided.

The HEE modules can be equipped as capacitor charger with very low output voltage overshoot (option C). The patented resonant converter technology guarantees high efficiency and low EMI.

Output Voltage V _{NOM}	Max. Output Current I _{NOM}	Model		Ripple / Noise @f>10Hz max.	Output Connector
		Positive Polarity Output	Negative Polarity Output		

0 – 500V	120mA	HEE-0.5P120-24-#	HEE-0.5N120-24-#	0.25V _{PP} *	SHV
0 – 1 000V	60mA	HEE-1P60-24-#	HEE-1N60-24-#	0.5V _{PP} *	SHV
0 – 1 500V	40mA	HEE-1.5P40-24-#	HEE-1.5N40-24-#	0.75V _{PP} *	SHV
0 – 2 000V	30mA	HEE-2P30-24-#	HEE-2N30-24-#	1V _{PP} *	SHV
0 – 2 000V	40mA	HEE-2P40-24-#	HEE-2N40-24-#	1.5V _{PP}	SHV
0 – 3 000V	20mA	HEE-3P20-24-#	HEE-3N20-24-#	1.5V _{PP} *	SHV
0 – 4 000V	15mA	HEE-4P15-24-#	HEE-4N15-24-#	2V _{PP} *	SHV
0 – 5 000V	12mA	HEE-5P12-24-#	HEE-5N12-24-#	2.5V _{PP} *	SHV
0 – 6 000V	10mA	HEE-6P10-24-#	HEE-6N10-24-#	3V _{PP} *	SHV
0 – 8 000V	7mA	HEE-8P7-24-#	HEE-8N7-24-#	4V _{PP}	HB11
0 – 10 000V	6mA	HEE-10P6-24-#	HEE-10N6-24-#	5V _{PP}	HB11
0 – 15 000V	4mA	HEE-15P4-24-#	HEE-15N4-24-#	300V _{PP}	HB21
0 – 20 000V	3mA	HEE-20P3-24-#	HEE-20N3-24-#	400V _{PP}	HB21
0 – 30 000V	2mA	HEE-30P2-24-#	HEE-30N2-24-#	600V _{PP}	HB31

#: set/monitor voltage range designator: "5" for 0-5V. "10" for 0-10V on request (minimum order quantity applies).

*: available with reduced ripple on request (minimum order quantity applies).

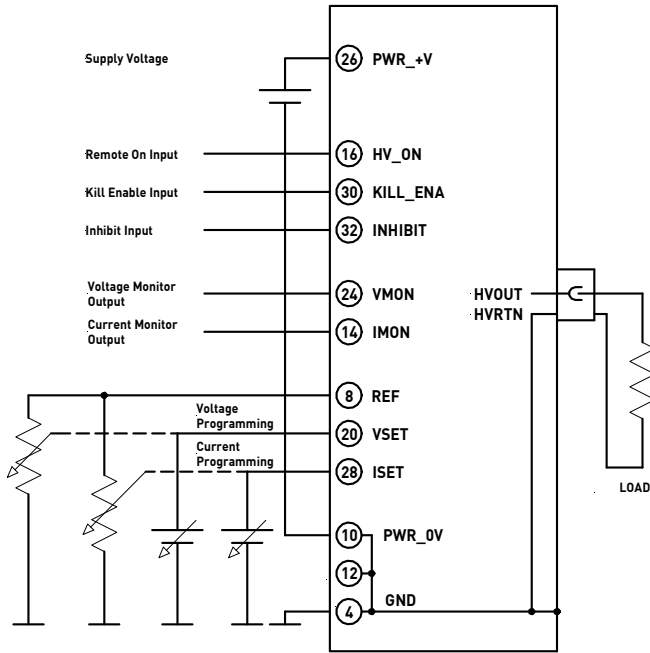
Standard models shown in **bold**. Minimum order quantity applies for non-standard models.

▪ SPECIFICATIONS

Input Supply Voltage (V_{IN}):	$+24V_{DC} \pm 5\%$ (max 3.5A - 60W models, max. 4.5A - 80W models)
Output Current Limit:	$(1.02 - 1.04) * I_{NOM}$
Line Regulation:	$< 1 * 10^{-4} * V_{NOM}$ (min to max supply voltage)
Load Regulation:	$< 2 * 10^{-4} * V_{NOM}$ (no load to rated load)
Temperature Coefficient:	$2 * 10^{-4}/K$
C-Charger Repeat Accuracy:	$< 2 * 10^{-2} * V_{NOM}$
Supply / Control Connector:	DIN 41612 H15 male
Control:	analog control signals: VSET, ISET, VMON, IMON 5V control inputs: HV_ON, KILL_ENA, INHIBIT
Reference Voltage (V_{REF}):	5.0V (max. 1mA); 10.0V (max. 1mA) optionally for -10 models. This reference voltage is intended for external potentiometers to program the output voltage and/or current (connect wiper to VSET, ISET)
Voltage Setting (VSET):	$V_{SET} = 0$ to V_{REF} results in $V_{OUT} = 0$ to $V_{NOM} \pm 1\%$
Current Limit Setting (ISET):	$V_{SET} = 0$ to V_{REF} results in $I_{OUT} = 0$ to $I_{NOM} \pm 1\%$
Voltage Monitor (VMON)	$V_{OUT} = 0$ to V_{NOM} results in $V_{VMON} = 0$ to V_{REF}
Current Monitor (IMON)	$I_{OUT} = 0$ to I_{NOM} results in $V_{IMON} = 0$ to V_{REF}
Remote ON (HV_ON)	5V level, active Low Low: V_{OUT} according to V_{SET} with ramp ca. $V_{NOM}/4s$ High or open: $V_{OUT} = 0$ with ramp ca. $V_{NOM}/4s$
Kill (KILL_ENA)	5V level, active High High: $V_{OUT} = 0$ without ramp if signal INHIBIT is active Restoring the output voltage is only possible after applying INHIBIT or HV_ON again Low or open: V_{OUT} according to V_{SET}
Inhibit (INH)	5V level, active Low Low: V_{OUT} off High or open: V_{OUT} according to V_{SET}
Protection:	Overload, arc, output short circuit, over-voltage, over-temperature. 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}
Cooling:	Convection cooling; has to be sufficient under load conditions
Dimensions:	Euro cassette 3U x 12HP x 160mm

All voltages are referenced to GND

CONNECTION DIAGRAM



PIN FUNCTION DESCRIPTIONS

Pin No.	Designation	Function
4	GND	Signal Ground
8	REF	Reference Voltage Output
10, 12	PWR_0V	Supply Voltage Ground
14	IMON	Current Monitor Output
16	HV_ON	Remote On Input
20	VSET	Voltage Programming Input
24	VMON	Voltage Monitor Output
26	PWR_+V	Input Supply Voltage
28	ISET	Current Programming Input
30	KILL_ENA	Kill Enable Input
32	INHIBIT	Inhibit Input

GND, PWR_0V and HVRTN are internally connected; the case is connected to GND.

OPTIONS

C capacitor charger with very low output voltage overshoot

ORDERING INFORMATION

HEE	-	2	P	30	-	24	-	5	-	C
Base Part Designation		Output Voltage [kV _{DC}]	Output Polarity	Output Current [mA]		Input Supply Voltage [V _{DC}]		Set/Monitor Voltage Range [V _{DC}]		Options (if applicable)

Examples: HEE-2P30-24-5 (HEE series, 2kV, positive polarity, 30mA, 24V supply, 5V reference)

HEE-2P30-24-5-C (HEE series, 2kV, positive polarity, 30mA, 24V supply, 5V reference, capacitor charger option)

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!