

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

▪ **FEATURES**

- Precise high voltages up to 30kV at max. 60W
- Positive or negative polarity
- Output voltage and current control
- Internal reference voltage
- Stable output voltage
- Low ripple and noise
- Low EMI
- Inhibit and ON inputs
- Capacitor charger and arc management options
- Patented resonance converter technology
- Metal case
- Modified versions available on request
- Made in Germany



Output Voltage V_{NOM}	Max. Output Current I_{NOM}	Model	Ripple / Noise $\Delta f > 10\text{Hz}$ typ.	Internal Capacitance nominal	Internal Capacitance at V_{NOM}	Damping Resistor	Discharge Resistor
				Basic Model			
				Capacitor Charger (option C)			
0 – 500V	120mA	HME-0.5x120-24-5	0.1V _{PP}	3000nF 2000nF	2000nF	0.02kΩ 0.11kΩ	5MΩ 5MΩ
0 – 1 000V	60mA	HME-1x60-24-5	0.1V _{PP}	1200nF 220nF	220nF	0.1kΩ 0.4kΩ	55MΩ 55MΩ
0 – 1 500V	40mA	HME-1.5x40-24-5	0.1V _{PP}	750nF 150nF	150nF	0.1kΩ 1.5kΩ	55MΩ 55MΩ
0 – 2 000V	30mA	HME-2x30-24-5	0.2V _{PP}	600nF 200nF	200nF	0.1kΩ 1.5kΩ	55MΩ 55MΩ
0 – 3 000V	20mA	HME-3x20-24-5	0.5V _{PP}	140nF 60nF	12nF	1kΩ 2kΩ	55MΩ 55MΩ
0 – 4 000V	15mA	HME-4x15-24-5	2V _{PP}	64nF 24nF	9nF	1kΩ 2kΩ	55MΩ 55MΩ
0 – 5 000V	12mA	HME-5x12-24-5	2.5V _{PP}	64nF 24nF	6nF	1.4kΩ 2.35kΩ	500MΩ 500MΩ
0 – 6 000V	10mA	HME-6x10-24-5	0.5V _{PP}	64nF 24nF	5nF	3.6kΩ 10.5kΩ	500MΩ 500MΩ
0 – 8 000V	7mA	HME-8x7-24-5	4V _{PP}	22.0nF 7.6nF	3.2nF	9.0kΩ 13.5kΩ	500MΩ 250MΩ
0 – 10 000V	6mA	HME-10x6-24-5	1V _{PP}	22.0nF 7.6nF	2.6nF	9.0kΩ 13.5kΩ	500MΩ 250MΩ
0 – 15 000V	4mA	HME-15x4-24-5	120V _{PP}	6.8nF 6.8nF	2.8nF	13.5kΩ 13.5kΩ	330MΩ 330MΩ
0 – 20 000V	3mA	HME-20x3-24-5	400V _{PP}	3.0nF 3.0nF	1.4nF	55kΩ 55kΩ	330MΩ 330MΩ
0 – 30 000V	2mA	HME-30x2-24-5	500V _{PP}	2.2nF 2.2nF	0.9nF	68kΩ 68kΩ	330MΩ 330MΩ

x: output voltage polarity designator: "P" or "N" for positive or negative respectively

HME modules are versatile, precise and stable analog controlled high voltage power supplies with multiple options. The HME series covers output voltages of up to 30kV in a compact metal box. A version in a 3U/12HP cassette is available too (HEE series). The maximum output power is 60W; for models with higher output power please see the HME 150W series. The HV output is brought out via an HV cable. The control voltages and analog I/O are connected via a D-Sub 9 connector. The control of output voltage and current is achieved by means of control voltages or potentiometers (internal reference voltage). Remote ON and Inhibit inputs, as well as output voltage and output current monitoring outputs, are provided. The HME modules can be equipped as capacitor charger with very low output voltage overshoot (option C). They also can be protected against high-frequency arcs (option A). For medium quantities the devices can be equipped with a Safety-Interlock loop. The patented resonant converter technology and the metal box shielding guarantee high efficiency and low EMI. The HME modules can be used as standalone DC/DC converters or combined into THQ series multichannel AC/DC HV power supplies.

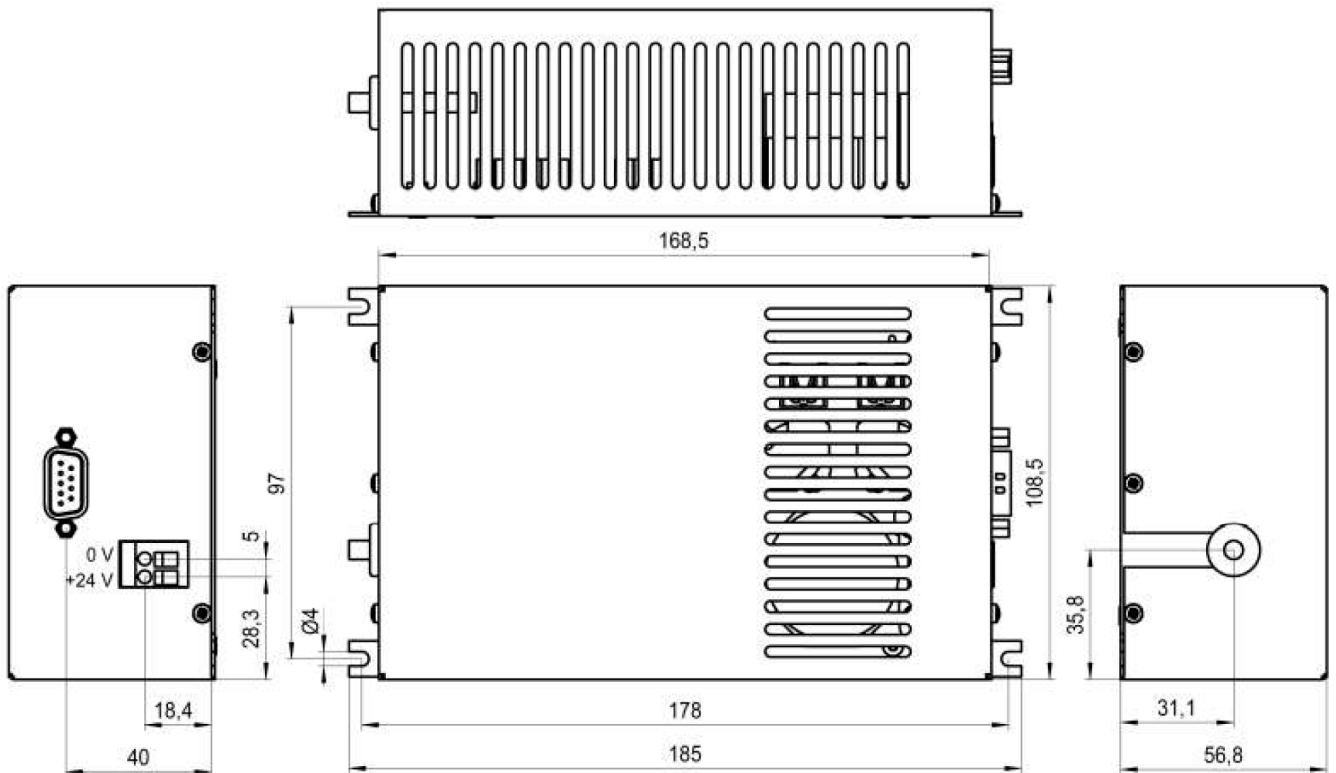
■ SPECIFICATIONS

Input Supply Voltage (V _{IN}):	+22.8V _{DC} to +26.4V _{DC} (max 3.5A)		
Output Polarity:	positive or negative; factory fixed		
Line Regulation:	standard:	$< 1 * 10^{-4} * V_{NOM}$	($\Delta V_{OUT} / \Delta V_{IN}$ min to max supply voltage)
	option C:	$< 2 * 10^{-4} * V_{NOM}$	
Load Regulation:	$< 2 * 10^{-4} * V_{NOM}$		($\Delta V_{OUT} / \Delta R_{LOAD}$ no load to rated load)
Temperature Coefficient:	2 * 10 ⁻⁴ /K		
Control:	analog control signals: VSET, ISET, VMON, IMON 5V control inputs: INH, ON		
Reference Voltage (REF):	V _{REF} =5V	(at 10kΩ load)	
	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 _{VSET} = 0 to V _{REF} results in V _{OUT} = 0 to V _{NOM} ±1%		(R _i : 10MΩ pull-down)
Voltage Ramp Up/Down:	standard:	ca. 0.25 * V _{NOM} / s	
	capacitor charger models (C):	< 50ms to V _{NOM}	
Current Limit Setting (ISET):	V _{ISET} = 0 to V _{REF} results in I _{OUT} = 0 to I _{NOM} ±1%		(R _i : 10MΩ pull-up against V _{REF})
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}		
Repeat Accuracy:	< 1% * V _{OUT}		(capacitor charger models)
Efficiency:	> 80%		(at rated output power)
Remote ON (ON):	active Low	(10kΩ pull-up to +5V)	
	Low (0V to 1V):	V _{OUT} according to V _{VSET}	
	High (3.5V to 10V) or open:	V _{OUT} = 0	
	The output voltage ramps up/down at ramp speed given above.		
Inhibit (INH):	active Low	(10kΩ pull-up to +5V)	
	Low (0V to 1V):	V _{OUT} off	
	High (3.5V to 10V) or open:	V _{OUT} according to V _{VSET}	
	The output will be shut off immediately without ramp by INH=Low.		
	After power-on or shutdown due to an error condition (input voltage out of range, over-temperature, output overvoltage) INH must be held Low for >300ms to re-establish normal operation.		
	Remote ON (ON) or Inhibit (INH) signals must not be used for safety-relevant shut down!		
Arc Indicator (ARC):	(option A models only)		
	active Low	(20kΩ pull-up to +5V plus 22kΩ series resistance)	
	Low (0V to 1V) for some ms:	Arc occurred	
	High (3.5V to 5V):	normal operation	
Protection:	Overload, output short circuit, over-voltage, over-temperature, (Interlock), arc (-A models)		
	Only one short circuit or arc event per second allowed!		
	In case of higher S.C. or arc frequency the RMS output current must be limited to I _{NOM}		

Input Supply Connector:	2-pole screw terminal block, max. 2.5mm ²
Control Connector:	D-Sub 9 male
Output Connection:	shielded HV cable (ca. 600mm); other lengths on request
Temperature Range:	Operating: -20°C to +50°C Storage: -20°C to +60°C
Humidity:	20% to 90% non-condensing
Dimensions overall (LxWxH):	185 x 108.5 x 56.8 mm ³
Weight:	1.0kg to 1.25kg, depending on model

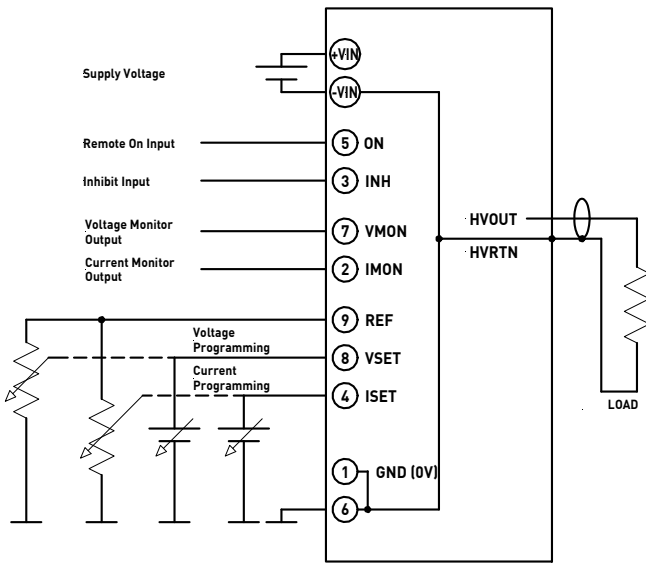
All voltages are referenced to GND

▪ DIMENSIONS



Dimensions in mm, drawing not to scale

CONNECTION DIAGRAM (STANDARD MODELS)



PIN FUNCTION DESCRIPTIONS

Pin No.	Designation	Function
1	GND (0V)	Signal GND (connected to pin 6)
2	IMON	Current Monitor Output
3	INH	Inhibit Input
4	ISET	Current Programming Input
5	ON	HV ON Input
6	GND	Signal GND (connected to pin 1)
	ARC	On models with option A: Arc Indicator Output
7	VMON	Voltage Monitor Output
8	VSET	Voltage Programming Input
9	REF	Reference Voltage Output
	+VIN	Input Supply Voltage
	-VIN	Supply Voltage Ground

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

OPTIONS

- A** protection against high-frequency arcs (for set/monitor voltage 5V only)
- C** capacitor charger with very low output voltage overshoot

ORDERING INFORMATION

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

HME-2P30-24-5-C (HME 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!