

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
- Inhibit input
- Hardware limits for voltage and current
- Metal case
- Modified versions available on request
- Made in Germany



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

The HV output is brought out via an HV cable. The supply and control voltages are connected via a D-Sub 9 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 and the metal box shielding guarantee high efficiency and low EMI.

The HMC modules can be used as standalone DC/DC converters or combined into THQ series multichannel AC/DC HV power supplies.

Output Voltage V_{NOM}	Max. Output Current I_{NOM}	Model	Internal Capacitance Nominal	Damping Resistor	Discharge Resistor	Ripple / Noise *1 $@f > 10\text{Hz}$ typ.
0 – 500V	20mA	HMC-0.5x20-24-#	620nF	0.05k Ω	55M Ω	10mV _{PP}
0 – 1000V	10mA	HMC-1x10-24-#	250nF	0.1k Ω	55M Ω	20mV _{PP}
0 – 1500V	8mA	HMC-1.5x8-24-#	120nF	0.1k Ω	55M Ω	30mV _{PP}
0 – 2000V	6mA	HMC-2x6-24-#	65nF	0.1k Ω	55M Ω	40mV _{PP}
0 – 3000V	4mA	HMC-3x4-24-#	42nF	0.1k Ω	55M Ω	60mV _{PP}
0 – 4000V	3mA	HMC-4x3-24-#	30nF	0.2k Ω	500M Ω	80mV _{PP}
0 – 5000V	2mA	HMC-5x2-24-#	30nF	0.7k Ω	500M Ω	100mV _{PP}
0 – 7000V	1.5mA	HMC-7x1.5-24-#	5nF	0.7k Ω	500M Ω	150mV _{PP}
0 – 10000V	1mA	HMC-10x1-24-#	14nF	13k Ω	660M Ω	500mV _{PP}
0 – 15000V	0.6mA	HMC-15x0.6-24-#	3.5nF	13k Ω	660M Ω	750mV _{PP}
0 – 20000V	0.5mA	HMC-20x0.5-24-#	3nF	13k Ω	660M Ω	1000mV _{PP}
0 – 30000V	0.3mA	HMC-30x0.3-24-#	1.7nF	20k Ω	660M Ω	1500mV _{PP}

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

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

■ SPECIFICATIONS

Input Supply Voltage (V _{IN}):	24V _{DC} ± 5%
Input Supply Current *2:	50mA max. (at V _{OUT} = 0) 800mA max. (at V _{OUT} = V _{NOM} , max load)
Line Regulation *1:	< 1 * 10 ⁻⁴ * V _{NOM} (ΔV _{OUT} / ΔV _{IN} min to max supply voltage)
Load Regulation *1:	< 2 * 10 ⁻⁴ * V _{NOM} (ΔV _{OUT} / ΔR _{LOAD} no load to rated load)
Temperature Coefficient:	≤ 100ppm/K
Supply / Control Connector:	D-Sub 9 male
Output:	shielded HV cable (600mm)
Control:	analog control signals: VSET, ISET, VMON, IMON 5V control inputs: INH
Reference Voltage (V _{REF}):	option "5": 5.0V (max 1mA) option "10": 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 _{SET} = 0 to V _{REF} results in V _{OUT} = 0 to V _{NOM} ±1% (input impedance: 1MΩ)
Current Limit Setting (ISET):	V _{SET} = 0 to V _{REF} results in I _{LIMIT} = 0 to I _{NOM} ±1% Open input results in I _{LIMIT} = I _{NOM} The output current is not limited to I _{NOM} internally V_{SET} must not exceed V_{REF} !
Voltage Monitor (VMON)	V _{OUT} = 0 to V _{NOM} results in V _{VMON} = 0 to V _{REF} ±1% (output impedance: 10kΩ)
Current Monitor (IMON)	I _{OUT} = 0 to I _{NOM} results in V _{IMON} = 0 to V _{REF} ±1% (output impedance: 10kΩ)
Inhibit (INH)	5V level, active Low Low: V _{OUT} = 0 High or open: V _{OUT} according to V _{SET} 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}
Temperature Range:	Operating: 0°C to +50°C Storage: -20°C to +60°C
Humidity:	≤ 70%
Dimensions:	see drawing

Notes:

All voltages are referenced to GND

*1 at 2% * V_{NOM} < V_{OUT} ≤ V_{NOM}; I_{SET} ≥ 4% * I_{NOM}

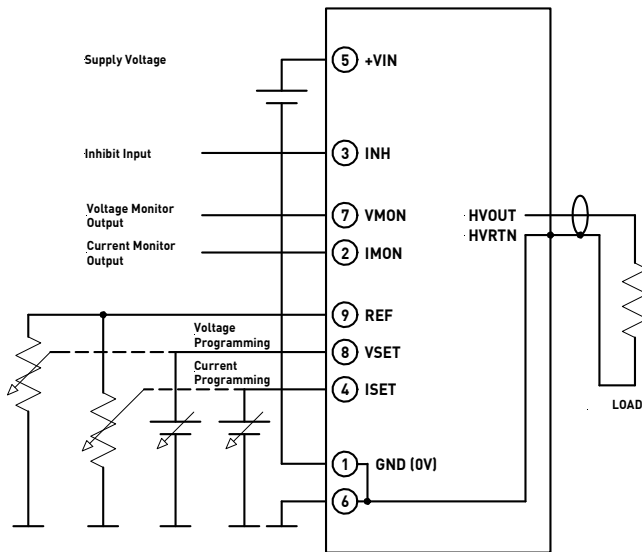
*2 at full rated output voltage, rated load, 25°C, after 1h warm up

■ ORDERING INFORMATION

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

CONNECTION DIAGRAM

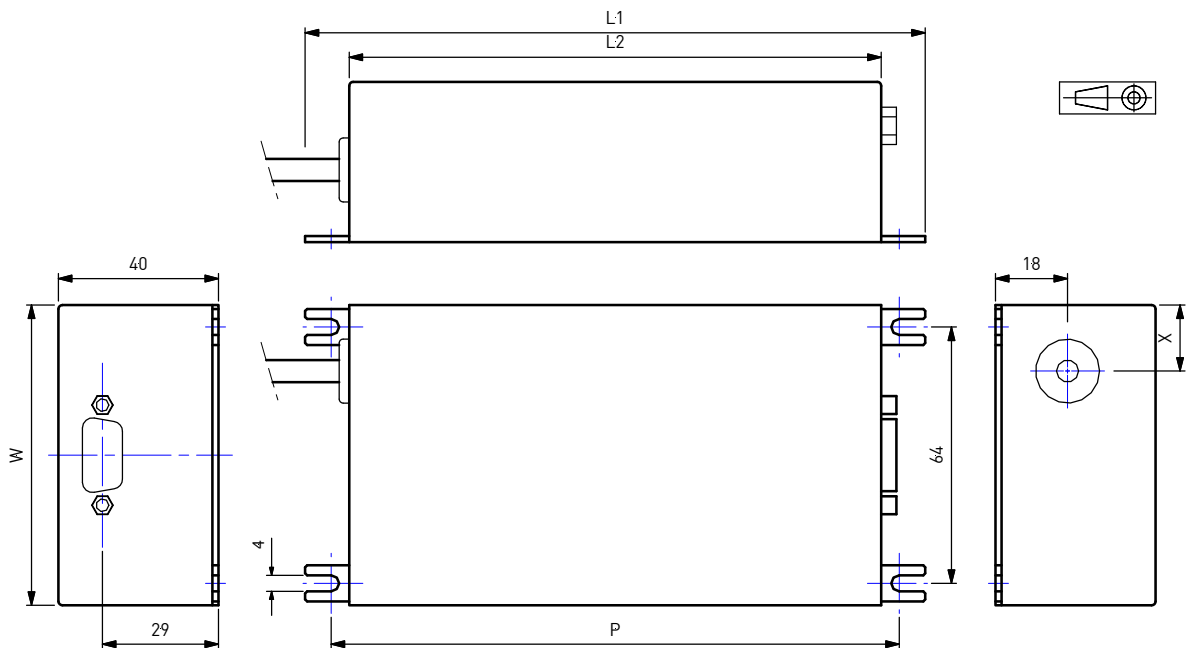


PIN FUNCTION DESCRIPTIONS

Pin No.	Designation	Function
1	GND (0V)	Power 0V (connected to pin 6)
2	IMON	Current Monitor Output
3	INH	Inhibit Input
4	ISET	Current Programming Input
5	+VIN	Input Supply Voltage
6	GND	Signal GND (connected to pin 1)
7	VMON	Voltage Monitor Output
8	VSET	Voltage Programming Input
9	REF	Reference Voltage Output

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

DIMENSIONS



Dimensions in mm

Drawing not to scale

	500V-7kV models	10kV-20kV models	30kV models
L1	155	185	185
L2	133	165.6	165.6
W	75	75.5	95.6
P	142	172	172
X	16.5	16.7	26.8

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!