HMC Series

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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>10Hz typ.
0 – 500V	20mA	**HMC-0.5x20-24-#**	620nF	0.05kΩ	55MΩ	10mV$_{PP}$
0 – 1000V	10mA	**HMC-1x10-24-#**	250nF	0.1kΩ	55MΩ	20mV$_{PP}$
0 – 1500V	8mA	**HMC-1.5x8-24-#**	120nF	0.1kΩ	55MΩ	30mV$_{PP}$
0 – 2000V	6mA	**HMC-2x6-24-#**	65nF	0.1kΩ	55MΩ	40mV$_{PP}$
0 – 3000V	4mA	**HMC-3x4-24-#**	42nF	0.1kΩ	55MΩ	60mV$_{PP}$
0 – 4000V	3mA	**HMC-4x3-24-#**	30nF	0.2kΩ	500MΩ	80mV$_{PP}$
0 – 5000V	2mA	**HMC-5x2-24-#**	30nF	0.7kΩ	500MΩ	100mV$_{PP}$
0 – 7000V	1.5mA	**HMC-7x1.5-24-#**	5nF	0.7kΩ	500MΩ	150mV$_{PP}$
0 – 10000V	1mA	**HMC-10x1-24-#**	14nF	13kΩ	660MΩ	500mV$_{PP}$
0 – 15000V	0.6mA	**HMC-15x0.6-24-#**	3.5nF	13kΩ	660MΩ	750mV$_{PP}$
0 – 20000V	0.5mA	**HMC-20x0.5-24-#**	3nF	13kΩ	660MΩ	1000mV$_{PP}$
0 – 30000V	0.3mA	**HMC-30x0.3-24-#**	1.7nF	20kΩ	660MΩ	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

Models below 10kV will be discontinued in the near future. Please see our HMM or HMD series for suitable replacements.

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▪ SPECIFICATIONS

Input Supply Voltage (V_{IN}):	$24V_{DC}$ ± 5%	
Input Supply Current *2:	50mA max. (@ V_{OUT} = 0)	
	800mA max. (@ V_{OUT} = V_{NOM}, max load)	
Line Regulation *1:	< $1 * 10^{-4} * V_{NOM}$ ($\Delta V_{OUT} / \Delta V_{IN}$	min to max supply voltage)
Load Regulation *1:	< $2 * 10^{-4} * V_{NOM}$ ($\Delta V_{OUT} / \Delta R_{LOAD}$	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_{VSET} = 0 to V_{REF} results in V_{OUT} = 0 to V_{NOM} ±1%	(input impedance: 1MΩ)
Current Limit Setting (ISET):	V_{ISET} = 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_{ISET} 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_{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}	
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)

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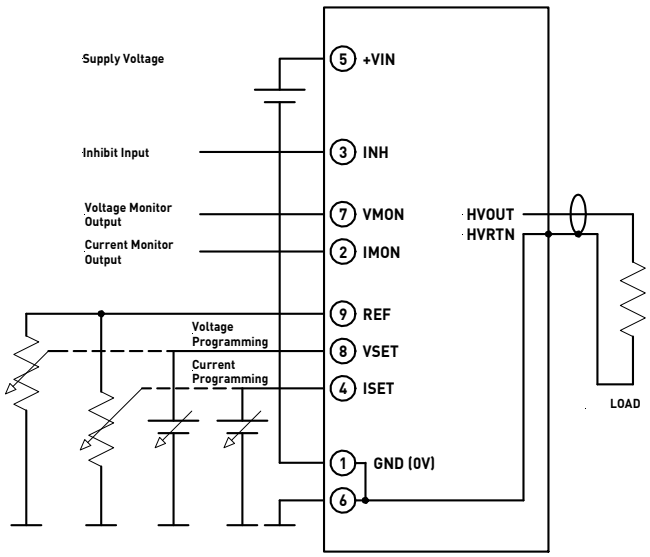
CONNECTION DIAGRAM

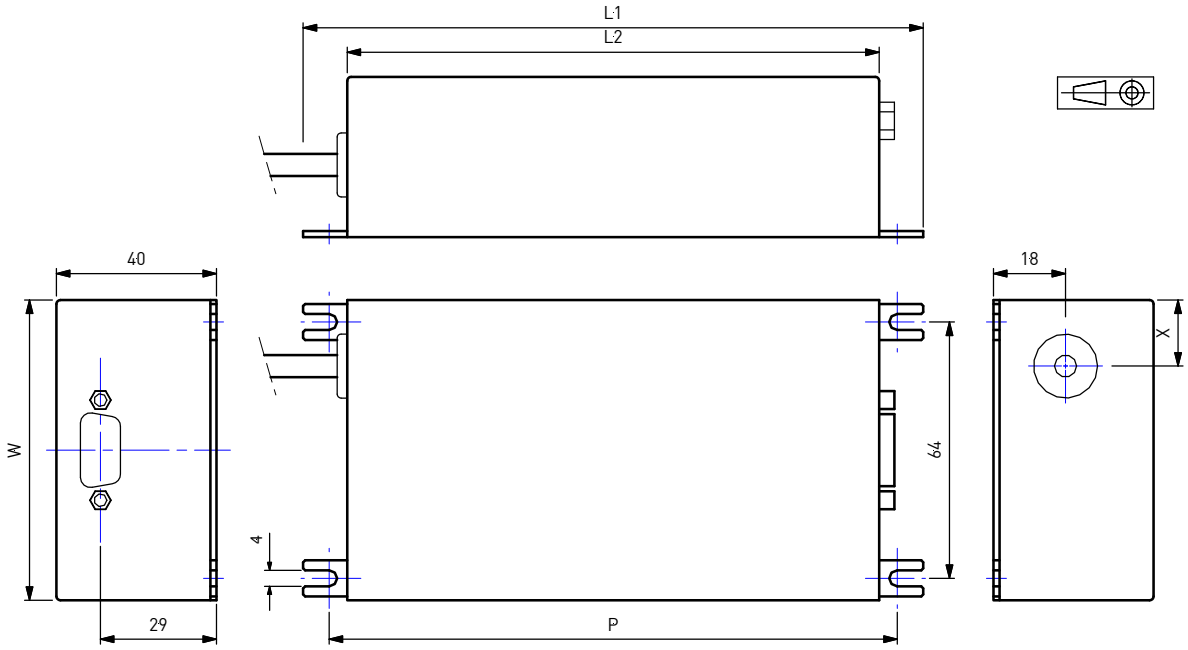


PIN FUNCTION DESCRIPTIONS

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

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