

0.5kV - 10kV; 5W - 9W
COMPACT, PRECISION REGULATED
HIGH VOLTAGE POWER SUPPLIES

■ **FEATURES**

- Precise high voltages up to 10kV at max. 9W
- Very compact metal case
- Very low ripple and noise
- Inhibit input
- Very low EMI
- Patented resonance converter technology
- Modified versions available on request
- Made in Germany



The HMM modules are highly precise and highly stable, analog controlled high voltage power supplies with fixed output polarity. The HMM series covers output voltages of up to 10kV in a very compact metal box. The maximum output power is 9W.

The HV output is brought out either via an HV cable or via a high voltage connector. 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). To protect the connected load an inhibit input is provided.

The patented resonant converter technology and the metal box shielding guarantee high efficiency and low EMI.

Output Voltage V_{NOM}	Max. Output Current I_{NOM}	Model	Internal Capacitance Nominal	Damping Resistor	Discharge Resistor
0 – 500V	15mA	HMM-0.5x15-24-R	450nF	0.10k Ω	3.3M Ω
0 – 1000V	8mA	HMM-1x8-24-R	425nF	0.22k Ω	50M Ω
0 – 2000V	4mA	HMM-2x4-24-R	44nF	1.0k Ω	50M Ω
0 – 3000V	3mA	HMM-3x3-24-R	33nF	1.5k Ω	50M Ω
0 – 4000V	2mA	HMM-4x2-24-R	22nF	1.5k Ω	50M Ω
0 – 6000V	1mA	HMM-6x1-24-R	12nF	18k Ω	200M Ω
0 – 8000V	1mA	HMM-8x1-24-W	5nF	36k Ω	500M Ω
0 – 10000V	0.5mA	HMM-10x0.5-24-W	4nF	54k Ω	500M Ω
0 – 10000V	1mA	HMM-10x1-24-W	4nF	54k Ω	500M Ω

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

W / R: output implementation designator: “W” or “R” for cable or connector respectively

The standard output implementation for 0.5kV – 6kV units is an SHV connector, the 8kV and 10kV units are equipped with a shielded HV cable.

8kV and 10kV / 0.5mA versions on request only; minimum order quantities apply.

■ SPECIFICATIONS

Input Supply Voltage (V_{IN}):	24V _{DC} ± 5%	
Input Supply Current:	50mA max. (at $V_{OUT} = 0$) 600mA max. (at $V_{OUT} = V_{NOM}$, max load)	
Line Regulation:	$< 1 * 10^{-5} * V_{NOM}$	($\Delta V_{OUT} / \Delta V_{IN}$ min to max supply voltage)
Load Regulation:	$< 1 * 10^{-5} * V_{NOM}$	($\Delta V_{OUT} / \Delta R_{LOAD}$ no load to rated load)
Temperature Coefficient:	50ppm/K	
Ripple:	typ. $\leq 3mV_{PP}$, max. 10mV _{PP}	(at $f > 10Hz$)
Supply / Control Connector:	D-Sub 9 male	
Output:	0.5kV to 6kV models: SHV connector 8kV, 10kV models: shielded HV cable	
Control:	analog control signals: VSET, ISET, VMON, IMON 5V control inputs: INH	
Reference Voltage (V_{REF}):	5.0V ± 1% (max 2.5mA) 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 $I_{NOM} \pm 1\%$	
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)
Inhibit (INH):	5V level, active Low Low: $V_{OUT} = 0$ High or open: V_{OUT} according to V_{VSET}	
Voltage Ramp up/down:	ca. 0.25 V _{NOM} /s	
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 +40°C Storage: -20°C to +85°C	
Humidity:	$\leq 70\%$	
Dimensions:	see drawing	

All voltages are referenced to GND.

Specifications for stability, ripple and noise are valid in the range $2\% * V_{NOM} < V_{OUT} \leq V_{NOM}$, $I_{SET} \geq 4\% * I_{NOM}$, 25°C, after 1h warm up

■ ORDERING INFORMATION

HMM	-	0.5	P	15	-	24	-	R
Base Part Designation		Output Voltage [kV _{DC}]	Output Polarity	Output Current [mA]		Input Supply Voltage [V _{DC}]		Output Implementation Designator

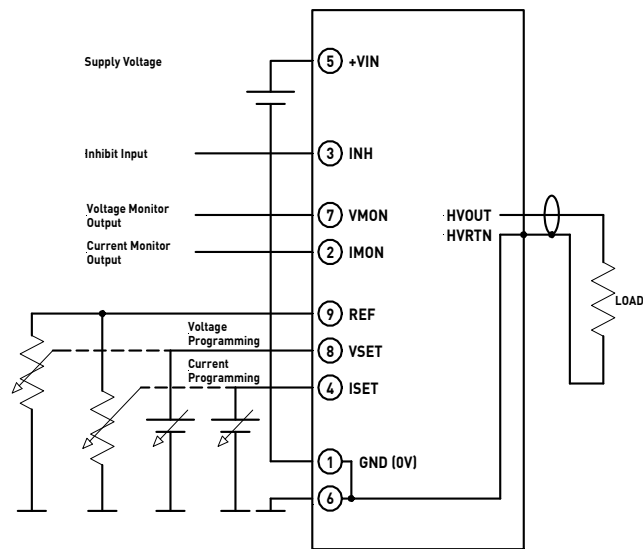
Examples: HMM-0.5P15-24-R (HMM series, 500V, positive, 15mA, 24V supply, SHV connector)

HMM-10N1-24-W (HMM series, 10kV, negative, 1mA, 24V supply, , cable output)

■ MOUNTING INSTRUCTION

The module can be mounted by two screws M3 (see drawing for max. screw-in depth) in horizontal or upright position. The power loss is dissipated via the base surface of the module (62.5mm or 74mm wide). If the module is mounted on this surface, low thermal resistance between the module and the assembling plane must be ensured!

CONNECTION DIAGRAM



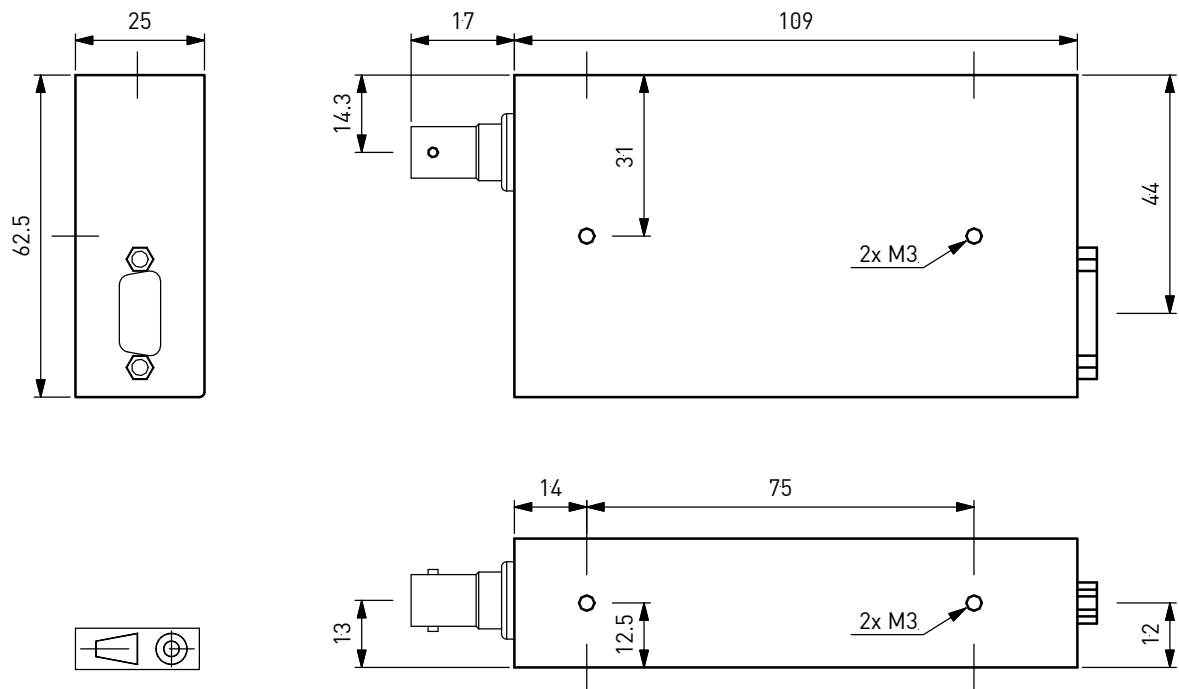
PIN FUNCTION DESCRIPTIONS

Pin No.	Designation	Function
1	GND (0V)	Supply Voltage Ground (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 Ground (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.

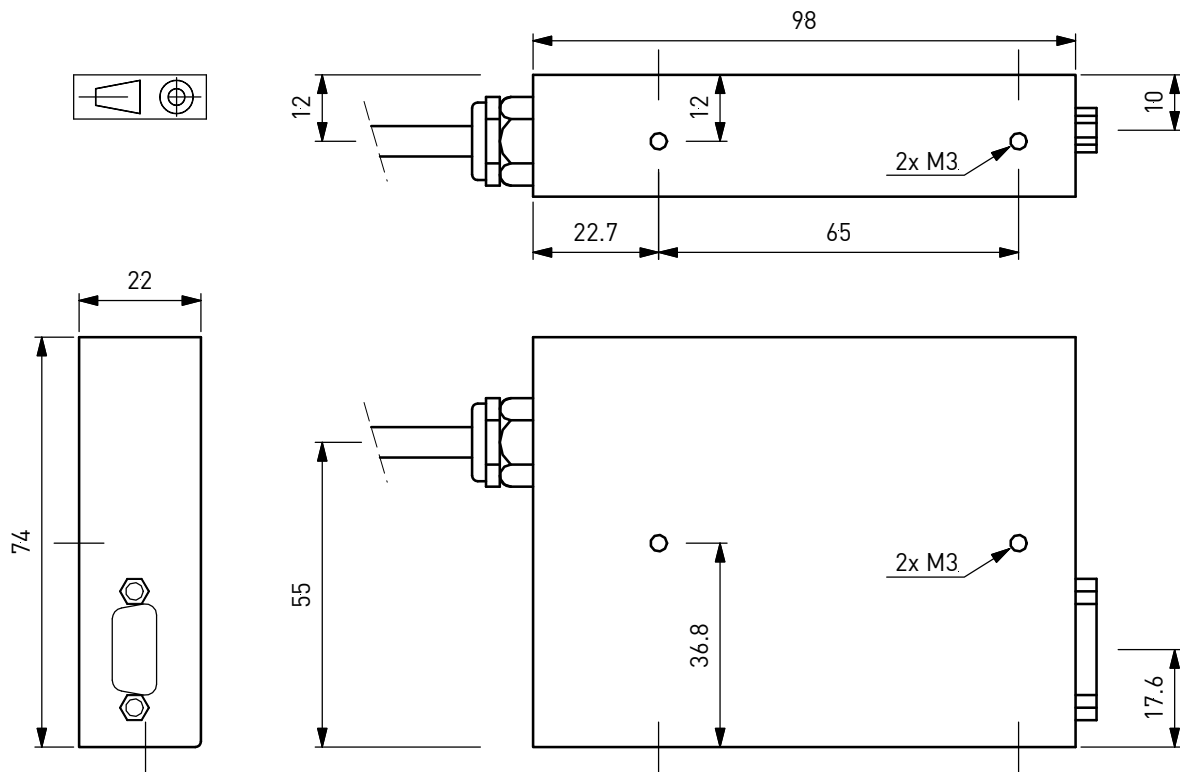
DIMENSIONS

HMM-0.5 thru HMM-6



Screw-in depth of mounting screws: 4mm
Dimensions in mm; drawing not to scale.

HMM-8 and HMM-10



Screw-in depth of mounting screws: 5mm
 Dimensions in mm; drawing not to scale.

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!