HMM Series

hivolt.de

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-#**	450nF	0.10kΩ	3.3MΩ
0 – 1000V	8mA	**HMM-1x8-24-#**	425nF	0.22kΩ	50MΩ
0 – 2000V	4mA	**HMM-2x4-24-#**	44nF	1.0kΩ	50MΩ
0 – 3000V	3mA	**HMM-3x3-24-#**	33nF	1.5kΩ	50MΩ
0 – 4000V	2mA	**HMM-4x2-24-#**	22nF	1.5kΩ	50MΩ
0 – 6000V	1mA	**HMM-6x1-24-#**	12nF	18kΩ	200MΩ
0 – 8000V	1mA	**HMM-8x1-24-#**	5nF	36kΩ	500MΩ
0 – 10000V	0.5mA	**HMM-10x0.5-24-#**	4nF	54kΩ	500MΩ

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

#: output implementation designator: "**W**" or "**R**" for cable or connector respectively

The standard output implementation for 0.5kV – 6kV units is a SHV connector, the 8kV and 10kV units are equipped with a shielded HV cable. Other versions are available on request; minimum order quantity may apply.

hivolt.de GmbH & Co. KG
Oehleckerring 40 • D-22419 Hamburg • Germany • ✆ +49 40 537122-0 • 🖷 +49 40 537122-99 • info@hivolt.de • www.hivolt.de

▪ SPECIFICATIONS

Input Supply Voltage (V_{IN}):	$24V_{DC}$ ± 5%	
Input Supply Current:	50mA max.	(@ V_{OUT} = 0)
	600mA max.	(@ V_{OUT} = V_{NOM}, max load)
Line Regulation:	< 1 ∗ 10^{-5} ∗ V_{NOM}	(ΔV_{OUT} / ΔV_{IN} min to max supply voltage)
Load Regulation:	< 1 ∗ 10^{-5} ∗ V_{NOM}	(ΔV_{OUT} / ΔR_{LOAD} no load to rated load)
Temperature Coefficient:	50ppm/K	
Ripple:	typ. ⩽ $3mV_{PP}$, max. $30mV_{PP}$	(@ f>10Hz)
Supply / Control Connector:	D-Sub 9 male	
Output option "**W**":	shielded HV cable	
option "**R**":	0.5kV to 8kV models:	SHV connector
	10kV model:	KINGS 1064-1 connector
Control:	analog control signals: VSET, ISET, VMON, IMON	
	5V control inputs: INH	
Reference Voltage (V_{REF}):	5.0V ±1% (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%	
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 +40°C
	Storage:	-20°C to +85°C
Humidity:	⩽ 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} ⩽ V_{NOM}, I_{SET} ⩾ 4% * I_{NOM}, 25°C, after 1h warm up

▪ ORDERING INFORMATION

HMM	-	0.5	P	15	-	24	-	W
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-W (HMM series, 500V, positive, 15mA, 24V supply, cable output)

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

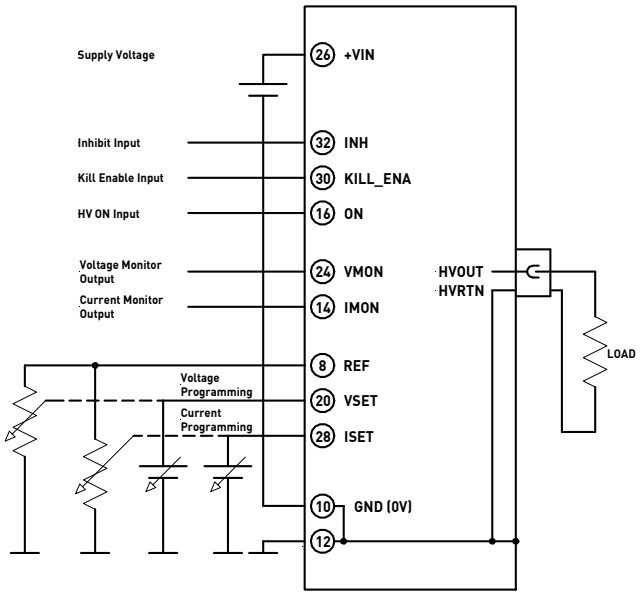
HMM-10N0.5-24-R (HMM series, 10kV, negative, 0.5mA, 24V supply, KINGS connector)

▪ 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!

hivolt.de GmbH & Co. KG
Oehleckerring 40 • D-22419 Hamburg • Germany • ✆ +49 40 537122-0 • 🖷 +49 40 537122-99 • info@hivolt.de • www.hivolt.de

CONNECTION DIAGRAM (OPTION W)



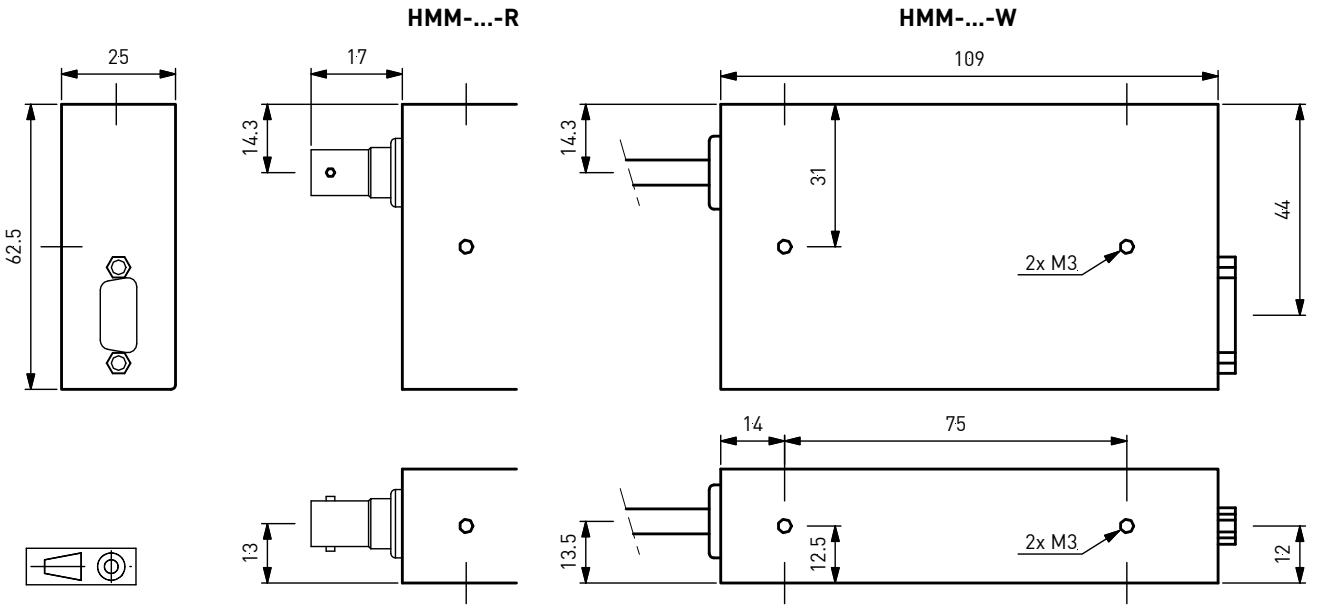
PIN FUNCTION DESCRIPTIONS

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

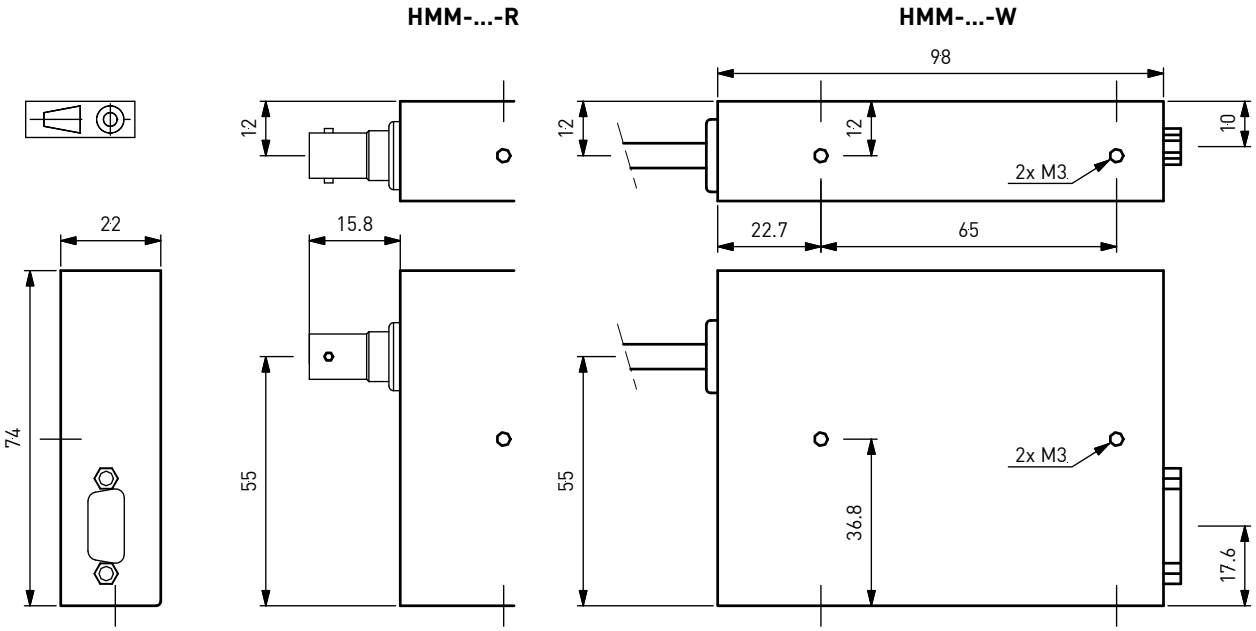
HMM-0.5 thru HMM-6



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

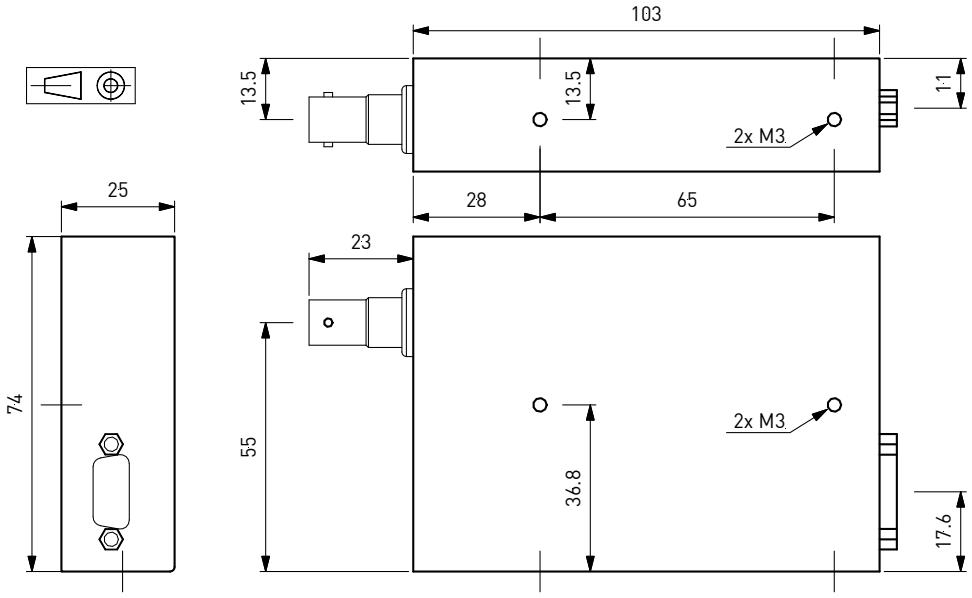
hivolt.de GmbH & Co. KG
Oehleckerring 40 • D-22419 Hamburg • Germany • +49 40 537122-0 • +49 40 537122-99 • info@hivolt.de • www.hivolt.de

HMM-8...-R, HMM-8...-W and HMM-10...-W



Screw-in depth of mounting screws: 5mm

HMM-10...-R



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

hivolt.de GmbH & Co. KG
Oehleckerring 40 • D-22419 Hamburg • Germany • ✆ +49 40 537122-0 • 🖷 +49 40 537122-99 • info@hivolt.de • www.hivolt.de