

1kV - 6kV; 8W REGULATED, PCB MOUNTABLE HIGH VOLTAGE POWER SUPPLIES

FEATURES

- Precise high voltages up to 6kV at max. 8W
- Very low ripple and noise
- Very low EMI
- Inhibit input
- PCB mountable module in metal case
- Modified versions available on request
- Made in Germany



The HML series is a family of highly stable, analog controlled high voltage DC to DC converters with fixed output polarity. The series covers output voltages of up to 6kV at 8W output power in a compact, PCB mountable, moulded metal package. Analog I/O is provided for control of output voltage and current limit by means of analog control voltages or potentiometers connected to the reference voltage output (VREF). The output can be shut down via the inhibit input (INH) by means of a TTL level signal.

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

Output Voltage V_{NOM}	Max. Output Current I_{NOM}	Model	Internal Capacitance Nominal	Damping Resistor	Discharge Resistor	Ripple / Noise @ $f > 10\text{Hz}$ max. ^{*/}
0 – 1000V	8.0mA	HML-1x8-24-5	110nF	0.22k Ω	55M Ω	2.5mV _{PP}
0 – 2000V	4.0mA	HML-2x4-24-5	45nF	1k Ω	55M Ω	5.0mV _{PP}
0 – 3000V	2.5mA	HML-3x2.5-24-5	33nF	1.5k Ω	55M Ω	7.5mV _{PP}
0 – 4000V	2.0mA	HML-4x2-24-5	24nF	1.5k Ω	200M Ω	10.0mV _{PP}
0 – 6000V	1.3mA	HML-6x1.3-24-5	18nF	5.1k Ω	200M Ω	15.0mV _{PP}

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

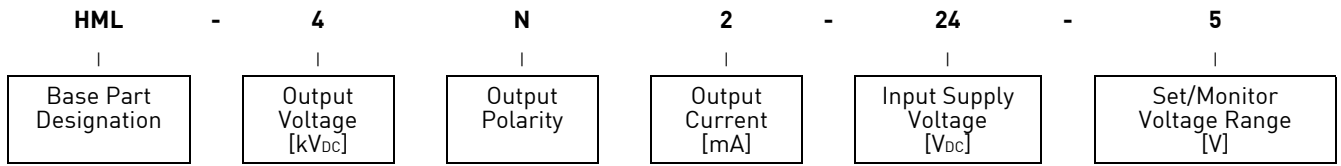
SPECIFICATIONS

Input Supply Voltage (V_{IN}):	+24V _{DC} \pm 5%	referenced to 0V (Pin 2)
Input Supply Current:	25mA max. 450mA max.	(@ $V_{OUT} = 0$) (@ $V_{OUT} = V_{NOM}$, max load)
Line Regulation:	$< 5 * 10^{-5} * V_{NOM}$	(ΔV_{OUT} at $V_{IN} = 24V-5\%$ to $24V+5\%$) ^{*/}
Load Regulation:	$< 2 * 10^{-4} * V_{NOM}$	(ΔV_{OUT} at no load to rated load) ^{*/}
Temperature Coefficient (V_{OUT}):	50ppm/K	
Control:	analog control/monitoring signals: VSET, ISET, VMON, IMON	
Reference Voltage (VREF):	5.0V	
Voltage Setting (VSET):	$V_{VSET} = 0$ to V_{REF} results in $V_{OUT} = 0$ to $V_{NOM} \pm 1\%$	
Current Limit Setting (ISET):	$V_{ISET} = 0$ to V_{REF} results in $I_{LIMIT} = 0$ to $I_{NOM} \pm 1\%$ The output current is not limited to I_{NOM} internally	
Voltage Monitor (VMON)	$V_{OUT} = 0$ to V_{NOM} results in $V_{VMON} = 0$ to $V_{REF} \pm 1\%$	
Current Monitor (IMON)	$I_{OUT} = 0$ to I_{NOM} results in $V_{IMON} = 0$ to $V_{REF} \pm 1\%$	
Inhibit (INH)	5V level, active Low	(internal pull-up)
	Low:	$V_{OUT} = 0$ with ramp ca. $0.25 * V_{NOM} / s$
	High or open:	V_{OUT} according to V_{VSET} with ramp 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 S.C. or arc frequency the RMS output current must be limited to I_{NOM}	
Temperature Range:	Operating: 0°C to +40°C Storage: -20°C to +60°C	
Humidity:	$\leq 70\%$	
Dimensions:	see drawing	

All voltages are referenced to GND, except for V_{IN} .

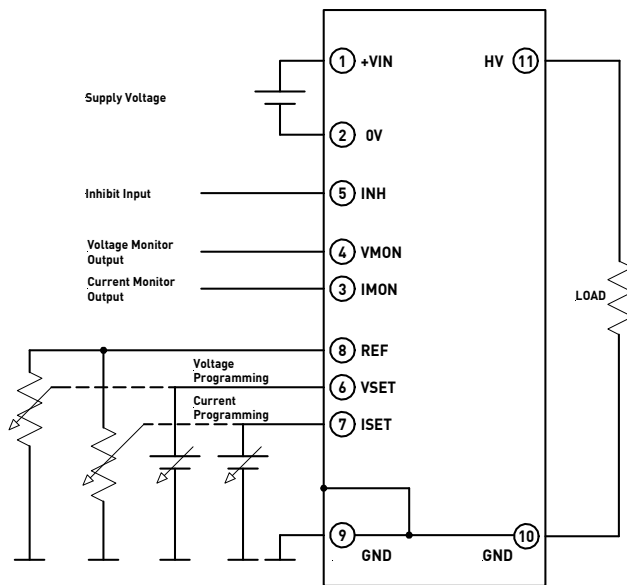
^{*/} Operation and specifications for stability, ripple and noise are valid in the range $2\% * V_{NOM} < V_{OUT} \leq V_{NOM}$, $I_{SET} \geq 1\% * I_{NOM}$, 25°C, after 1h warm up.

ORDERING INFORMATION



Example: **HML-4N2-24-5** (HML series, 4kV, negative, 2mA, 24V supply, 5V reference)

CONNECTION DIAGRAM



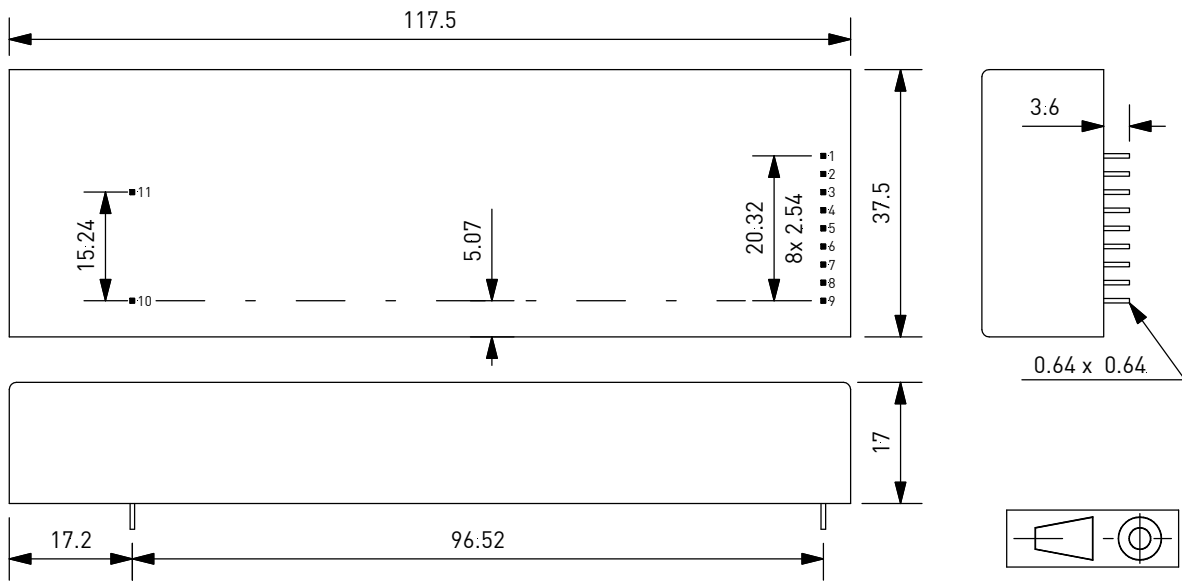
PIN FUNCTION DESCRIPTIONS

Pin No.	Designation	Function
1	+VIN	Input Supply Voltage #/
2	0V	Supply Voltage Ground #/
3	IMON	Current Monitor Output
4	VMON	Voltage Monitor Output
5	INH	Inhibit Input
6	VSET	Voltage Programming Input
7	ISET	Current Programming Input
8	REF	Reference Voltage Output
9	GND	Signal Ground
10	GND	High Voltage Return
11	HV	High Voltage Output

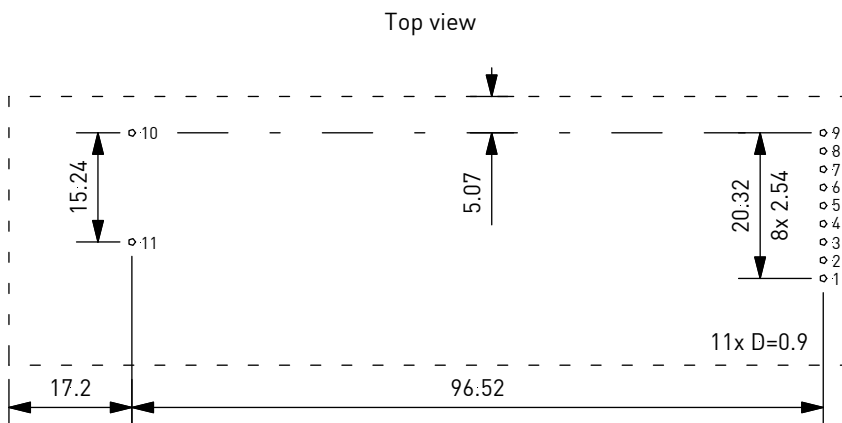
Pins 9 and 10 are internally connected and connected to the case.

#/ The supply voltage inputs (pin 1 VIN, pin 2 0V) are isolated from GND.
 Maximum voltage difference between 0V and GND: 50V.
 The 24V supply voltage source should be connected to GND externally.

▪ DIMENSIONS



▪ FOOTPRINT



Dimensions are 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!