

Figure 1. Physical Photo of A1UHVACP5KV4MARM

FEATURES

- High precision
- High efficiency
- High output voltage stability
- Linear modulation of output voltage
- Overcurrent protection
- Arc and Short circuit protection
- Digital display for output voltage and current
- OEM Customization Available

APPLICATIONS

A1UHVACP5KV4MARM, is designed for achieving AC-DC conversion from AC voltage to high DC voltage. This series high voltage power supply is rack-mounted, and is mainly used in ion beam injection, semiconductor technology, electron beam welding, capacitor charging, high power radio frequency transmitter, accelerator, CW laser, high voltage insulation test, lithography technology, X-ray system, electrostatic applications, scientific experiments, industrial applications and other fields.

DESCRIPTION

The power supply comes with high stability, high reliability, high accuracy of output voltage regulation, and continuously adjustable output voltage; low time drift and temperature drift; it adopts modular design inside the power supply, with

protection against overvoltage, overcurrent, and arcing; the control interface uses industrial interface, with industrial design from circuit schematic to the overall structure; high integration and high detection accuracy; it has functions such as start-up soft-start and control; convenient for control, easy operation; the internal transformation of the power supply can be made based on the actual needs of the customer

SAFETY PRECAUTIONS

High voltage power supply must be connected to ground reliably.

Do not touch the high voltage wire, unless the high voltage power supply is powered off, and the load and internal capacitors are fully discharged.

When the high voltage power supply is powered off, wait for another 5 minutes for fully discharging all the capacitors inside the power supply.

Do not operate the power supply in humid environment, and do not connect the operator to ground.

The internal protection circuit is provided in the high voltage power supply, but the high voltage short circuit shall be avoided.

Make sure the circuit is insulated perfectly, especially between the high voltage output and the surroundings so as to avoid electronic shock.



SPECIFICATIONS

Table 1. Characteristics. $T_A = 25^\circ\text{C}$, unless otherwise noted

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit/Note
AC Input Voltage		V_{VPS}		100		230	V_{AC}
Quiescent Input Current		I_{INQQ}	$I_{OUT} = 0\text{mA}$ $V_{VPS} = 110 V_{AC}$	70	80	90	mA
Full Load Input Current		I_{INFLD}	$I_{OUT} = 4\text{mA}$ $V_{VPS} = 110 V_{AC}$	240	250	260	mA
Output Voltage		V_{OUT}	$I_{OUT} = 0 \sim 4\text{mA}$	0		5000	V
Maximum Output Current		I_{OUTMAX}	Full load			4	mA
Ripple			$I_{OUT} = 4\text{mA}$		<0.01		% V_{P-P}
Load					1.25		$M\Omega$
Potentiometer Adjustment				10k potentiometer or remote control 0 ~ +5V			
Output Modulation Linearity					<0.01		%
Voltage Regulation	Load		$I_{OUT} = 0 \sim 4\text{mA}$		<0.01		%+500mV
	Input		$V_{VPS} = 110\text{V} \sim 120\text{V}$		<0.01		%+500mV
Current Regulation	Load		$I_{OUT} = 0 \sim 4\text{mA}$		<0.01		%+100uA
	Input		$V_{VPS} = 110\text{V} \sim 120\text{V}$		<0.01		%
Instantaneous Short Circuit Current		I_{SC}			<20		mA
Full Load Efficiency		η			≥ 70		%
Temperature Coefficient		TCV_O	0 ~ 50°C		<0.005		%/°C
Time Drift	Short Time Drift		After 30 minute warm up		<0.05		%/ min
	Long Time Drift			<0.05		%/h	
Output Voltage Temperature Stability			0 ~ 50°C		< ± 0.01		%
Operating Temperature Range		T_{opr}		0		50	°C
Storage Temperature Range		T_{stg}		-40		85	°C
Humidity				20%-85% relative humidity non-condensing			
External Dimensions				483×350×44			mm
				19×13.78×1.73			inch
Weight					3.6		kg
					7.93		lbs
					126.98		Oz



PANEL INSTRUCTIONS

Front Panel

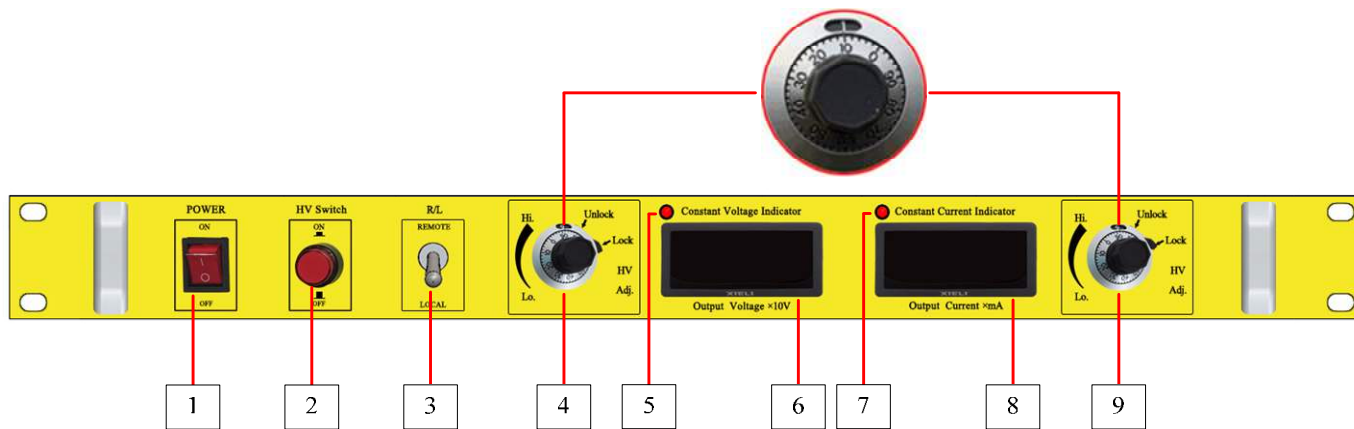


Figure 2. Front Panel

Table 2. Definitions of front panel keys

No.	Signal	Signal Parameters
1	Power	When the power is turned on, the indicator is on; when the power is turned off, the indicator is off.
2	HV Switch	High voltage ON, the indicator is on.
3	R/L	When the switch is in Remote, it is controlled remotely; when the switch is in Local, it is controlled locally.
4	HV Adjustment	10-turn potentiometer for adjusting output voltage. Rotate it clockwise to increase the output voltage, and the potentiometer resistance = the corresponding scale $\times 10\Omega$. For example, when the scale is 10, and the frame above the scale shows 1 (1k Ω), then the resistance = $10 \times 10\Omega + 1k\Omega = 1.1k\Omega$, and the like. HV output: 1.5m long connection wire outputs 5kV.
5	Constant Limit Indicator	When the voltage exceeds the preset voltage, the indicator is on.
6	Output Voltage Display	Digital display for the output voltage. The actual output voltage = the reading $\times 10V$.
7	Constant Limit Indicator	When the current exceeds the preset current, the indicator is on.
8	Output Current Display	Digital display for the output current. The actual output current = the reading $\times mA$.
9	Current Adjustment	10-turn potentiometer for adjusting output voltage. Rotate it clockwise to increase the output voltage, and the potentiometer resistance = the corresponding scale $\times 10\Omega$. For example, when the scale is 10, and the frame above the scale shows 1 (1k Ω), then the resistance = $10 \times 10\Omega + 1k\Omega = 1.1k\Omega$, and the like. HV output: 1.5m long connection wire outputs 4mA.



Back Panel



Figure 3. Front Panel

Table 3. Definitions of back panel function keys

No.	Signal	Signal Parameters
10	HV Output	High voltage output port with removable 1m long connection wire outputting 5kV and 4mA.
11	Output Ground	High voltage power supply output ground terminal.
12	Remote	8-pin connector. Refer to the following Table 4 and Figure 4 for remote control function.
13	Ac Input Voltage Switch	110V or 220V Input voltage selector switch
14	AC Main Power Input	AC input 110V\220V 50/60Hz connector.



Figure 4. 8-pin Connector

Table 4. 8-pin connector.

Pin	Signal	Signal Parameters	Lead the color
P1	Remote Voltage Program In	0 to 5V=0 to 100% rated output.	White
P2	Remote Current Program In	0 to 5V=0 to 100% rated output.	Yellow
P3	Voltage Monitor	0 to 5V=0 to 100% rated output.	Green
P4	Current Monitor	0 to 5V=0 to 100% rated output.	Blue
P5	Shutdown	A logic low <0.8V or a 0V on the SDN pin will turn the device off. When SDN is in logic high >1.2V or left unconnected, the product is working well.	Brown
P6	GND	Signal ground	Black



P7	Voltage Reference	+5VDC Reference	Red
P8	NC	No connection	

TESTING DATA

High voltage power supply testing data (Test condition: the load is 1.25MΩ).

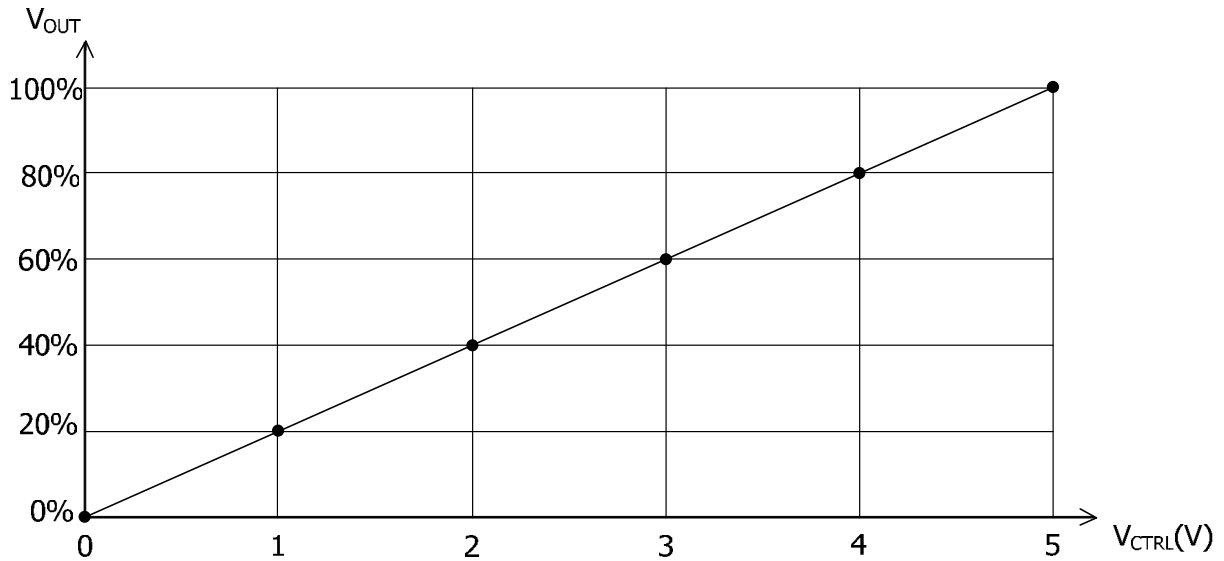


Figure 5. V_{CTRL} vs. V_{OUT}

NAMING INSTRUCTIONS

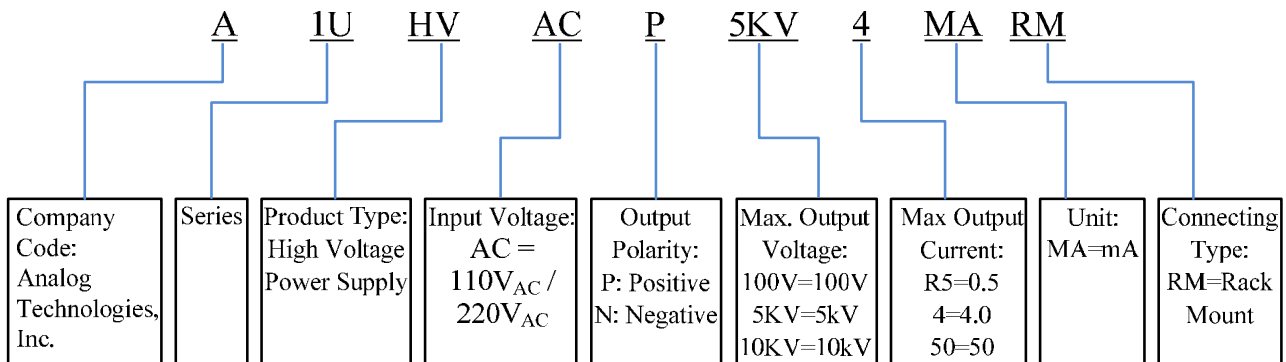


Figure 6. Naming Rules of A1UHVACP5KV4MARM



DIMENSIONS

I. Dimension of the leads.

Leads	Diameter (mm)	Length (m)
High voltage output wire	4.5	1.5
Power cord	6.5	1.8

II. Dimension of A1UHVACP5KV4MARM.

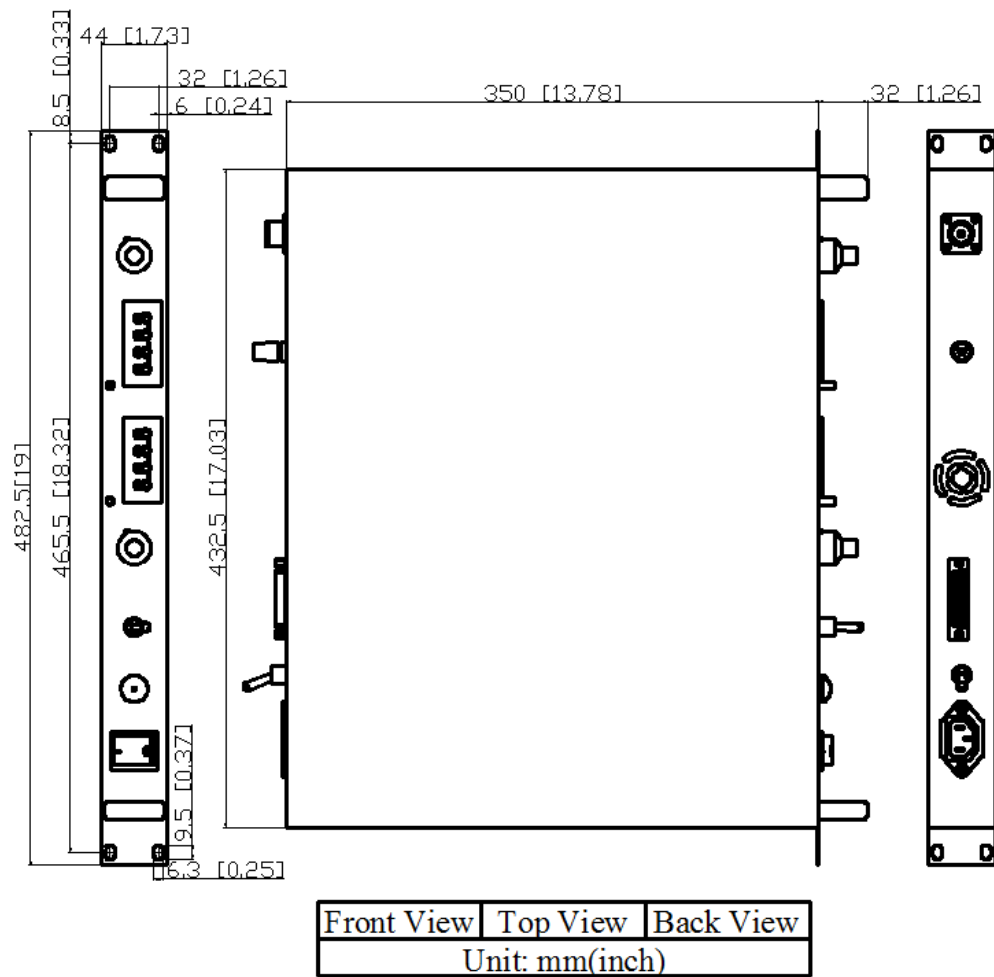


Figure 7. Dimensions for A1UHVACP5KV4MARM



NOTICE

1. ATI warrants performance of its products for one year to the specifications applicable at the time of sale, except for those being damaged by excessive abuse. Products found not meeting the specifications within one year from the date of sale can be exchanged free of charge.
2. ATI reserves the right to make changes to its products or to discontinue any product or service without notice, and advise customers to obtain the latest version of relevant information to verify, before placing orders, that information being relied on is current and complete.
3. All products are sold subject to the terms and conditions of sale supplied at the time of order acknowledgment, including those pertaining to warranty, patent infringement, and limitation of liability. Testing and other quality control techniques are utilized to the extent ATI deems necessary to support this warranty. Specific testing of all parameters of each device is not necessarily performed, except those mandated by government requirements.
4. Customers are responsible for their applications using ATI components. In order to minimize risks associated with the customers' applications, adequate design and operating safeguards must be provided by the customers to minimize inherent or procedural hazards. ATI assumes no liability for applications assistance or customer product design.
5. ATI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right of ATI covering or relating to any combination, machine, or process in which such products or services might be or are used. ATI's publication of information regarding any third party's products or services does not constitute ATI's approval, warranty or endorsement thereof.
6. IP (Intellectual Property) Ownership: ATI retains the ownership of full rights for special technologies and/or techniques embedded in its products, the designs for mechanics, optics, plus all modifications, improvements, and inventions made by ATI for its products and/or projects.