High Voltage Power Supply
AHVAC3KVR5MABT3

Figure 1. Physical Photo of AHVAC3KVR5MABT3

FEATURES

- High precision
- High efficiency
- 3-Channels Output
- High output voltage stability
- Linear modulation of output voltage
- Overcurrent protection
- Short circuit protection
- Digital display for output voltage

APPLICATIONS

The AHVAC3KVR5MABT3 is specifically designed for AC-DC conversion, transforming AC voltage into high DC voltage. It can be used for:

- X-ray Machine
- Spectral Analysis
- Nondestructive Inspection
- Semiconductor Manufacturing Equipment
- Particle Accelerator
- Capillary Electrophoresis
- Particles Injection
- Physical Vapor Phase Deposition
- Electrospinning Preparation of Nanofiber
- Glass/ Fabric Coating
- DC Reactive Magnetron Sputtering

DESCRIPTION

To operate the high voltage power supply, first connect the AC 90~230V input, and then turn on the power. Ensure the potentiometer is set to "0" before opening the high voltage switch. Next, adjust the potentiometer in a clockwise direction while observing the digital display value. The output voltage = the display value. When the required voltage is reached, rotate the potentiometer lock in a clockwise direction to lock the potentiometer. This will prevent accidental adjustments to the potentiometer, which could alter the output voltage. High voltage connection wire is used for high voltage output.

SAFETY PRECAUTIONS

To ensure safe operation, the high voltage power supply must be reliably grounded. Under no circumstances should the high voltage wire be touched unless the power supply is switched off and the load and internal capacitors are fully discharged. After switching off the power supply, it is recommended to wait for at least 5 minutes to allow all capacitors to fully discharge.

The power supply should not be operated in a humid environment, and the operator should not be connected to ground. Although the power supply includes internal protection circuits, high voltage short circuits must be avoided.

It is important to ensure that the circuit is properly insulated, particularly between the high voltage output and the surrounding environment, to prevent electric shock.

SPECIFICATIONS

Table 1. Characteristics.

T_A = 25°C, unless otherwise noted

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
AC Input Power Supply Voltage	V_{VPS}		90	110	230	V_{AC}
Input Power Supply Quiescent Current	I_{VPS_QC}	I_{VOUT} = 0mA VPS = 110V		≤70		mA
		I_{VOUT} = 0mA VPS = 220V		≤50		mA
Input Power Supply Current at Full Load	I_{VPS_FL}	I_{VOUT} = 0.5mA VPS = 110V		≤220		mA
		I_{VOUT} = 0.5mA VPS = 220V		≤110		mA
Input Voltage Regulation Ratio	$\Delta V_{OUT}/\Delta VPS$	VPS = 90V ~ 230V		0.05		%
Output Voltage Range	V_{VOUT}	I_{VOUT} = 0 ~ 0.5mA	0		3000	V
Output Current Range	$I_{VOUTMAX}$	V_{VPS} = 90V ~ 230V	0		0.5	mA
Output Load Resistance Range			$\frac{V_{VOUT}}{I_{VOUT}}$		∞	MΩ
Output Modulation Linearity				≤0.1		%
Output Voltage Temperature Coefficient	TC_{VOUT}	V_{VPS} = 90V ~ 230V V_{VOUT} = 3kV I_{VOUT} = 0.5mA T_A = −20°C ~ 55°C		≤0.01		%/°C
Output Voltage Range v.s. Temperature	$V_{VOUT}(T)$	V_{VPS} = 90V ~ 230V V_{VOUT} = 3kV I_{VOUT} = 0.5mA T_A = −20°C ~ 55°C	$0.99V_{VOUT}$	V_{VOUT}	$1.01V_{VOUT}$	V

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage Drift	Short Term Drift	$\frac{\lvert \Delta V_{VOUT}/V_{VOUT} \rvert}{\Delta t\ (min)}$	V_{VPS} = 90V ~ 230V V_{VOUT} = 3kV I_{VOUT} = 0.5mA T_A = −20°C ~ 55°C		≤0.05		%/min
	Long Term Drift	$\frac{\lvert \Delta V_{VOUT}/V_{VOUT} \rvert}{\Delta t\ (h)}$			≤0.05		%/h
Mean Time Between Failure		MTBF			1M		h
Instantaneous Short Circuit Current at the Output		I_{VOUT_SC}			≤0.1		mA
Load Regulation		$\frac{\lvert \Delta V_{VOUT}/V_{VOUT} \rvert}{\Delta I_{VOUT}}$	V_{VOUT} = 3kV I_{VOUT} = 0 ~ 0.5mA		≤0.05		%/mA
Full Load Efficiency		η	V_{VPS} = 90V ~ 230V V_{VOUT} = 3kV I_{VOUT} = 0.5mA		≥70		%
Operating Temperature Range		T_{opr}		−20		55	°C
Storage Temperature Range		T_{stg}		−20		80	°C
External Dimensions				350×304×125			mm
				13.78×11.96×4.92			inch
Weight					4000		g
					8.82		lbs
					141.10		Oz

PANNEL INSTRUCTIONS

Front Panel

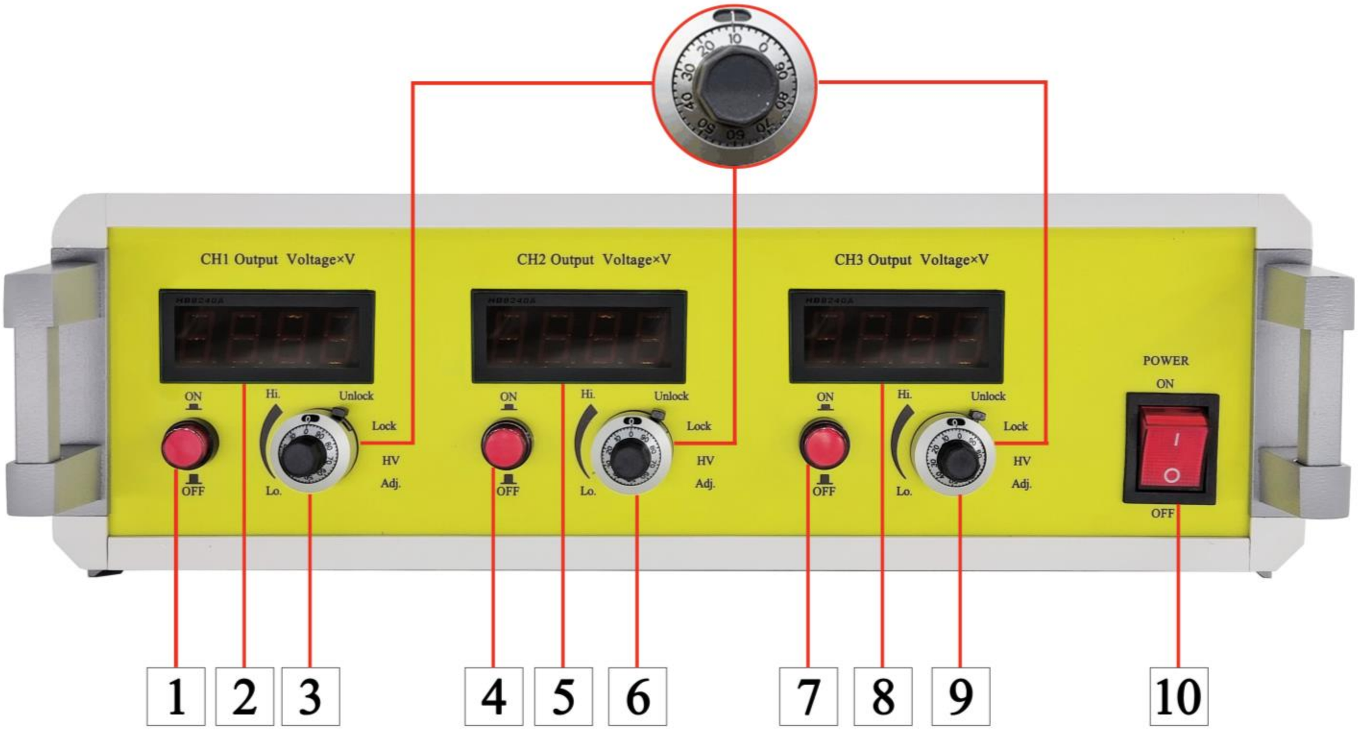

Figure 2. Front Panel

1. CH1 High Voltage Output ON/OFF Switch.
2. Display the CH1 output voltage: Digital display for the output voltage. The actual output voltage = the reading.
3. CH1 HV adjustment: 10-turn potentiometer for adjusting output voltage. Rotate it clockwise to increase the output voltage, and the potentiometer resistance = the corresponding scale × 20Ω+N × 2kΩ. The number of turns (N) is shown in the frame above the scale. For example, as Figure 2 shows, when the scale is 10, and the frame above the scale shows 1 (2kΩ), then the resistance =10×20Ω+1×2kΩ=2.2kΩ, and the like.
4. CH2 High Voltage Output ON/OFF Switch.
5. Display the CH2 output voltage: Digital display for the output voltage. The actual output voltage = the display value.
6. CH2 HV adjustment: 10-turn potentiometer for adjusting output voltage. Rotate it clockwise to increase the output voltage, and the potentiometer resistance = the corresponding scale × 20Ω+N × 2kΩ. The number of turns (N) is shown in the frame above the scale. For example, as Figure 2 shows, when the scale is 10, and the frame above the scale shows 1 (2kΩ), then the resistance =10×20Ω+1×2kΩ=2.2kΩ, and the like.
7. CH3 High Voltage Output ON/OFF Switch.
8. Display the CH3 output voltage: Digital display for the output voltage. The actual output voltage = the display value.

9. CH3 HV adjustment: 10-turn potentiometer for adjusting output voltage. Rotate it clockwise to increase the output voltage, and the potentiometer resistance = the corresponding scale × 20Ω+N × 2kΩ. The number of turns (N) is shown in the frame above the scale. For example, as Figure 2 shows, when the scale is 10, and the frame above the scale shows 1 (2kΩ), then the resistance =10×20Ω+1×2kΩ=2.2kΩ, and the like.

10. AC Main Power ON/OFF Switch.

Back Panel

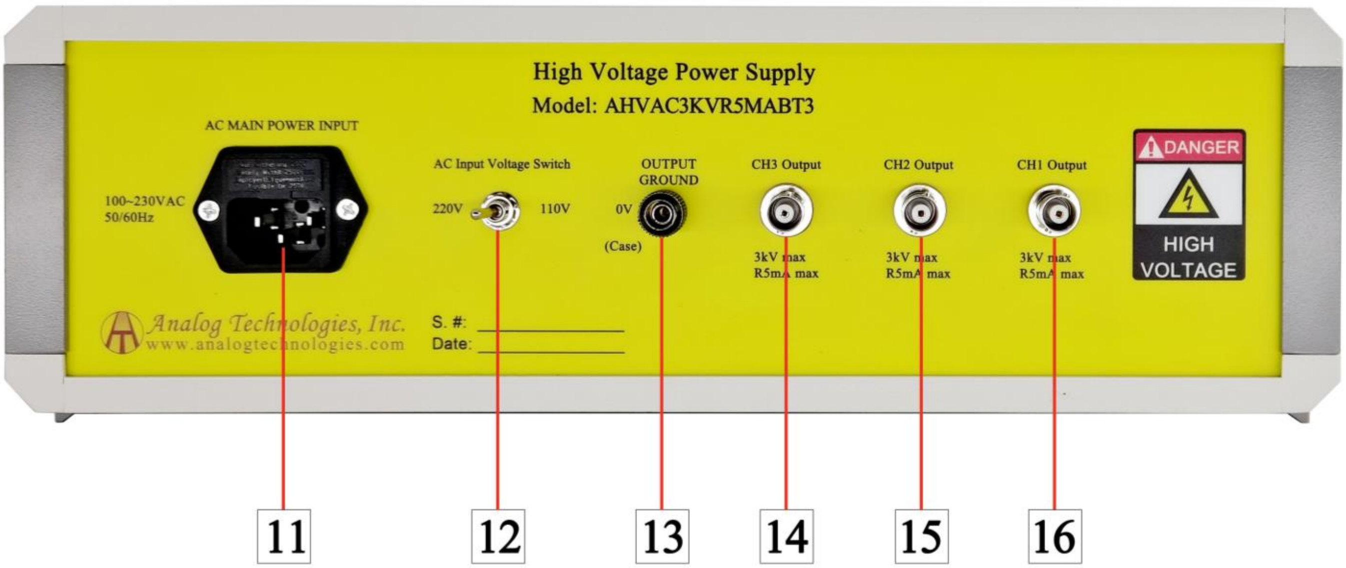

Figure 3. Front Panel

11. Input connector: AC input 90 ~ 230V 50/60Hz connector.

12. AC input voltage switch: check the input AC voltage is 110V or 220V before connecting the AC power supply.

13. Output ground: high voltage power supply output ground terminal.

14. CH1 HV output: 1m long connection wire outputs 3kV and 0.5mA.

15. CH2 HV output: 1m long connection wire outputs 3kV and 0.5mA.

16. CH3 HV output: 1m long connection wire outputs 3kV and 0.5mA.

TESTING DATA

Test conditions: V_{VPS} = 90 ~ 230V_{AC}, T_A = 25°C, R_{LOAD} = 6MΩ

The measured output voltage, V_{VOUT}, corresponding to the control port input voltage, V_{CTRL}, is shown in Figure 4.

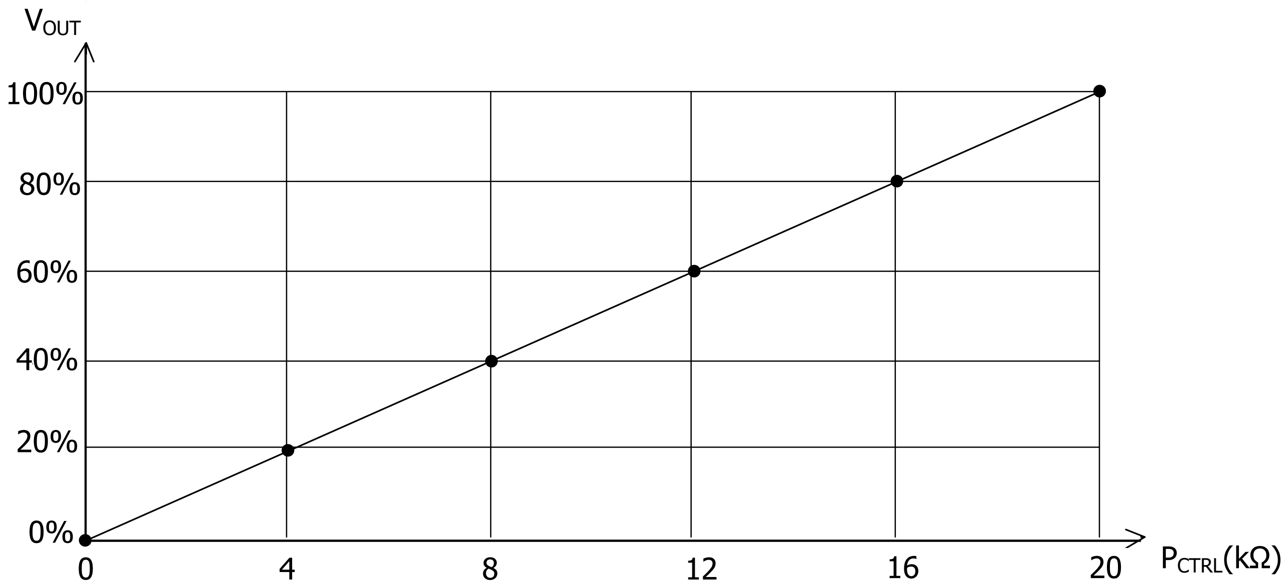

Figure 4. V_{CTRL} vs. V_{OUT}

NAMING PRINCIPLE

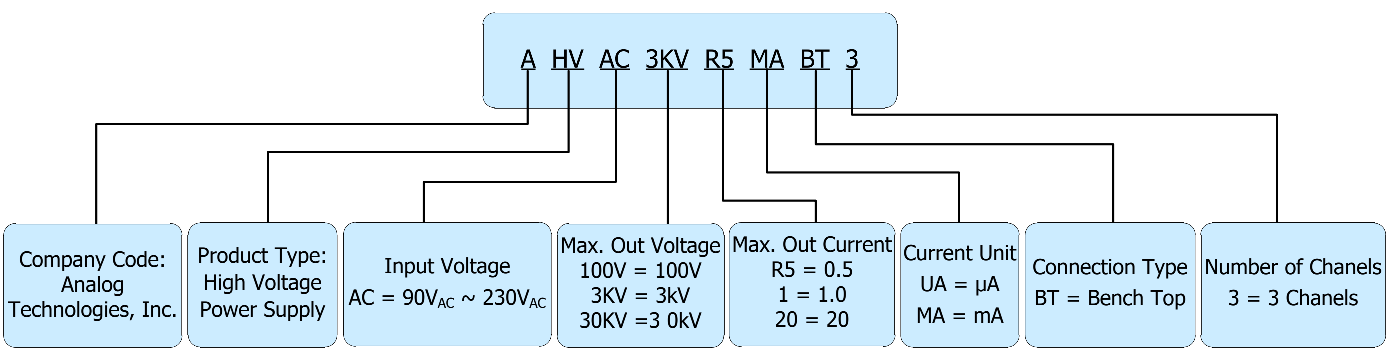

Figure 5. Naming Rules of AHVAC3KVR5MABT3

DIMENSIONS

I. Dimension of the leads.

Figure 6. Leads of AHVAC3KVR5MABT3

Lead Wires	Diameter		Length	
	mm	inch	mm	inch
Thick brown lead wire	4.5	0.177	1000	39.370
Power cord	6.5	0.256	1800	70.866

II. Outline Dimensions.

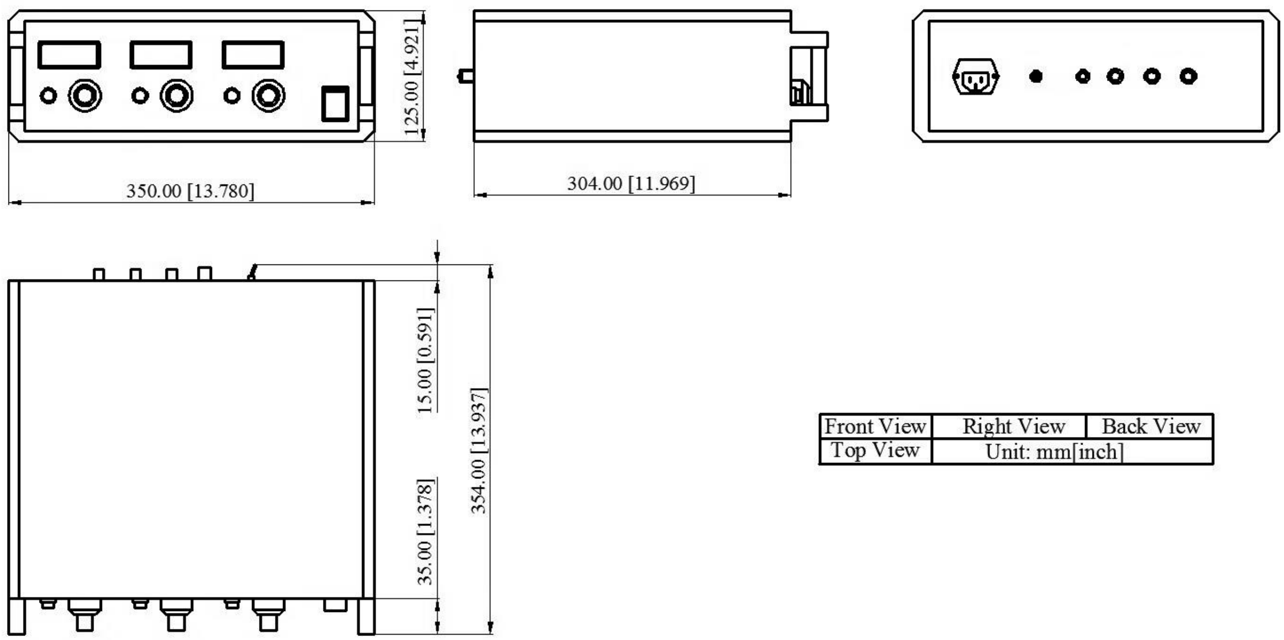

Figure 7. Outline Dimensions

ORDERING INFORMATION

Part Number	Buy Now
AHVAC3KVR5MABT3	* *

NOTICE

1. It is important to carefully read and follow the warnings, cautions, and product-specific notes provided with electronic components. These instructions are designed to ensure the safe and proper use of the component and to prevent damage to the component or surrounding equipment. Failure to follow these instructions could result in malfunction or failure of the component, damage to surrounding equipment, or even injury or harm to individuals. Always take the necessary precautions and seek professional assistance if unsure about proper use or handling of electronic components.
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