User Manual

APS-4000&APS-7000 series

AC Frequency Conversion Power Supply

MATRIX TECHNOLOGY INC.

Chapter 1 Safety Regulations

You should note safety regulations and matters when using it!

Safety signs

Caveat

It reminds users to pay attention to certain operation procedures, practices, conditions and other matters that may cause personal injury.

Note

It reminds the user of procedures, practices, conditions, etc. that may cause instrument damage or permanent data loss.


Body ground symbol


Ground symbol


High voltage hazard. (Non-professionals are not allowed to open the machine)


Refer to the warnings in the relevant documents and pay attention to the tips.

(High voltage, please do not touch during operation, beware of touching Electricity, do not use the machine in unsafe places)

1 Safety instructions

-Before using this AC variable frequency power supply, please read this operating instruction completely, and fully understand the safety signs used by this machine for safety.

-Please select the correct input voltage specification before turning on the input power switch of this machine.

To prevent accidental injury or death, professionals must connect the input or output lines. When moving and using the machine, be sure to observe clearly before operating■

2 Maintenance

User maintenance

To prevent electric shock, please do not open the cover of the instrument. All parts inside the instrument absolutely do not require user maintenance. If an abnormal situation occurs in the instrument, please seek maintenance from our company or its designated distributor. The attached circuit and block diagram are for reference only.

Regular maintenance

The AC power supply, the relevant accessories of the input power cord, etc. must be carefully checked and calibrated at least once a year to protect the safety of users and the accuracy of the instrument.

User modification

The user must not change the circuit or parts of the machine by themselves. If it is changed, the warranty period of the machine will automatically expire and our company is not responsible. The use of parts or accessories not approved by our company is also not guaranteed. If the machine returned for inspection is found to be changed, our company will restore the circuit or parts of the machine to the original design and charge a repair fee.

Chapter 2 Installation Essentials

Rules for product unpacking, inspection, preparation before use, and storage**.**

2.1 Unpacking and inspection

1. Unpack the AC inverter power supply, please check the attached accessories,

Accessories：

1. User Manual
2. Warranty Card
3. Power cable

2. The package of this product is protected by pearl cotton. If the customer receives a damaged box, please check the appearance of the machine for deformation, scratches, or damage to the panel.

3. If there is damage, please notify our company or its distributor immediately. And please keep the packing box and pearl cotton. Our service center will help you repair or replace the new machine. Do not return the product immediately without notifying our company or its distributor.

2.2 Check before use

1. Before the input power supply wiring, the power required for this machine, all switches should be placed in OFF position. Please connect the wiring according to the logo.
2. Please make sure all the wiring is correct before starting.
3. The model will be displayed on the screen when the computer is turned on, and the CPU will call the last setting value before shutting down, because the setting value has been memorized in the EEPROM of the machine after leaving each setting state .

Input voltage requirements and options

APS series AC variable frequency power supply uses single-phase 220V power supply. Before turning on the power switch of the machine, please confirm the choice of power supply. At the same time, you must use a regular fuse (already equipped at the factory). The specification of the fuse has been marked on the back panel of the instrument.

Before replacing the fuse, the input power must be turned off to avoid danger.

Input power requirements

Before connected to the input power, power must first confirm the ground line has been properly connected and also connected to the ground **| WARN** "on the ground terminal body. The power plug on the instrument can only be plugged into a power socket with a ground wire. Such as

I WAKZ1 [If you use an extension cord, you must pay attention to whether it has a ground wire. This AC variable frequency power supply uses a three-core power cord. When the cable is plugged into a socket with a ground wire, the body is grounded.

Environmental conditions of use

1. Temperature: 0 ◦C-40t
2. Relative humidity: W80% RH
3. High degree: at an altitude of 2000 meters above sea level.
4. No gas, vapor, chemical deposit, dust, dirt and other explosive and corrosive media that seriously affect the machine at the installation site;
5. The installation site should be free from severe vibration or bumps.

2.3 Storage and transportation

Surroundings

APS series AC variable frequency power supply can be stored and transported under the following conditions:

Ambient temperature the Temp 20C to to 60C

The height of the Height 7620 meters

This machine must avoid abrupt changes in temperature, which may cause moisture to condense inside the body.

Packing

Original package

Please keep all the original packaging materials, if the machine must be returned to the factory for repair, please use the original packaging materials. And please contact our company's maintenance center first. When sending for repair, please be sure to return all accessories such as the power cord together, please indicate the symptoms and causes. Also, please note in the package "Easy Scrap" Please handle with care.

Other packaging

If you cannot find the original packaging materials to pack, please follow the instructions below:

1, first with EPE bag or bubble pack the machine properly.

2, then the machine is placed can withstand 150Kg multilayer carton packaging.

3, around the machine must be filled shockproof material, a thickness of about 70 to 100mm.

4, properly sealed box.

5, marked "easy and scrap" Please handle with care.

Chapter 3 Technical Specifications

3.1 Main technical specifications

Technical specification table:

Model		APS-4000A	APS-4000B	APS-4000C
Power		350VA	700VA	1200VA
Working		SPWM（ Sinusoidal Pulse Width Modulation ）		
INPUT				
Phase		1 Φ2W		
Voltage		220V±10%		
Frequency		47Hz-63Hz		
OUTPUT				
Voltage		**0-150VAC / 0-300VAC AUTO**		
Frequency		**45-250Hz(0.01 Step)**		
Maximum Current	L=120V	3A	6A	10A
	H=240V	1.5A	3A	5A
Load		1%		
T.H.D		2% (low -end 120V, high-end 240V, with pure resistive load)		
Frequency stability		0.01%		
LED Display		Voltage Vrms, current Arms, frequency, power, power factor		
Voltage resolution		0.01V		
Frequency resolution		0.01Hz		
Current resolution		0.001A		
Memory		M1-M5CV-F-A)		
Measurement accuracy	voltage	±0.5%FS+5dgt		
	current	+ 0.5%FS+5dgt		
	frequency	±0.01%FS+5dgt		
	power	±0.5%FS+5dgt		
Setting accuracy	voltage	±1%FS		
	frequency	±0.1 %FS		
I-LIM Set		0-Max Current (＞The maximum current is: maximum capacity / 240V is P / 240)		
Output protection		Overcurrent, over temperature, overload, short circuit		
Weight (Kg)		12.7	15	18.5

Volume W*H*D (mm)	365x150x430
Operating Environment	0-40℃ 20-80%RH

3.2 Main technical specifications

Technical specification table:

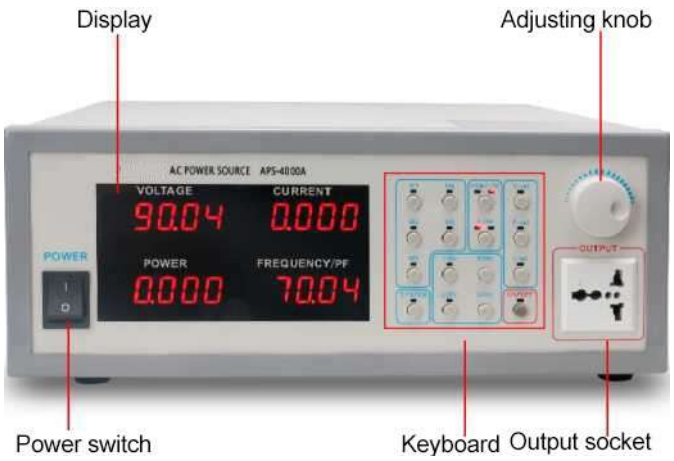
Model		APS-7105	APS-7100	APS-7200	APS-7300	APS-7500	APS-7110
Capacity		500VA	1KVA	2 KVA	3KVA	5KVA	10KVA
Production method		SPWM (Sinusoidal Pulse Width Modulation)					
INPUT							
Phase		1 Φ2W					
Voltage		220V ± 10%					
frequency		47Hz - 63Hz					
OUTPUT							
Voltage		0-150VAC / to 0-310 VAC AUTO(0-600V can be customized					
frequency		45-500Hz (0.1Step)					
Maximum current	**L = 120V**	4.2A	8.4A	16.8A	25A	42A	84A
	H = 240V	2.1A	4.2A	8.4A	12.5A	21A	42A
Load regulation rate		1%					
T.H.D		2% (low -end 120V, high-end 240V, with pure resistive load)					
Frequency stability		0.01%					
Significantly small		Voltage Vrms , current Arms , frequency Fre , power Watt x power factor PF					
Voltage resolution		0.01V					
Frequency resolution		0.01Hz					
Current resolution		0.001 A					
Memory		M1 (V_F_A) , M2 (V_F_A) , M3 (V_F_A) M4 ^ M5					
	voltage	± 0.5% FS + 5dgt					

Measuring Accuracy	current	± 0.5% FS + 5dgt					
	frequency	± 0.01% FS + 5dgt					
	power	± 0.5% FS + 5dgt					
Setting accuracy	voltage	± 1% FS					
	frequency	± 0.1% FS					
Interface		RS232C					
Current limit setting		0-Max Current (the maximum current is: maximum capacity / 240V , ie P / 240)					
Output protection		Overcurrent, Over Current, Over Temperature, Over Temp, Overload, Over Load short-circuit, Short Circuit					
Weight (Kg)		20.6	23	30.5	33.3	48	80
WxHxD (mm)		480x135x515		480x225x53.5		480*240*590	430*590*810
Operating environment		0~40° C 20-80% RH					

Chapter 4 Introduction of Operation Panel

4.1 Panel function introduction

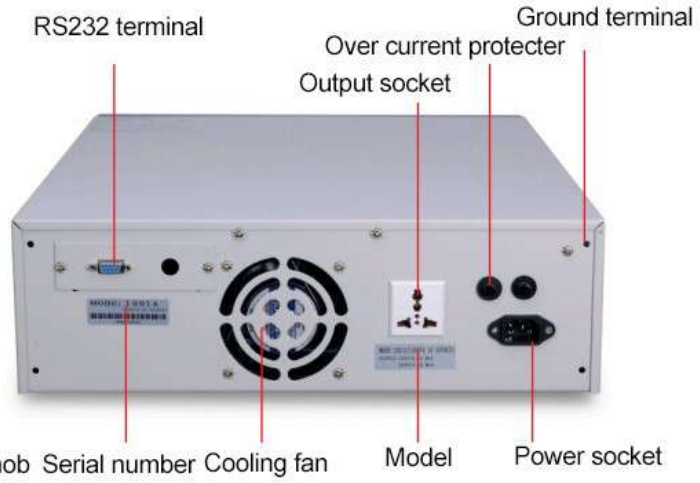
APS-4000 series front panel



APS-4000 series rear panel

APS-7000 series front panel

APS-7000 series rear panel



Chapter 5 Operating Instructions

5.1 Button layout

APS4000 Series

APS-7000 Series

Key Description

Key position	Key function description
110V	110V setting shortcut
220V	220V setting shortcut key
50Hz	50Hz setting shortcut
60Hz	60Hz setting shortcut
VSET	Voltage setting key
FSET	Frequency setting key
I SET	Maximum current setting key
SYSTEM	System setting key
HIGH / LOW	High and low gear switching key
P / PF	Power & power factor switch
▲	Setting parameter up key (APS5000AS column)
▼	Setting parameter down key (APS5000AS column)
	Save key
M2	Save key
M3	Save key
M4	Save key (APS4000S column)
M5	Save key (APS4000 series)
ON / OFF	Output switch & reset button

5.3 Voltage setting

In the standby or output state, press the VSET key and or key to adjust the voltage value (APS5000A ^ U only). It can also be set by adjusting the knob. The voltage range is divided into high and low gears, and the low gear voltage can be set as 0-150V, the high-end voltage can be set in the range of O ^ OOV; if you want to adjust the voltage above the low gear, remember to switch the voltage to the high gear to adjust, otherwise the voltage will be displayed at the highest voltage of the low gear.

The specific operations are as follows:

1. Press the "VSET" key in the standby or output state , the voltage window flashes, at this time you can use the or key to adjust the voltage value;

2. In standby or output state, press the "V-SET" key. When the voltage window flashes, you can also change the setting value by turning the knob to the left or right. Lightly press the knob to move the digit you want to set. When you press continuously, you can move from right to left Circular movement

3. If the voltage setting value is not changed for about 2 seconds, the voltmeter will flash once, and the new voltage value after memory will be memorized and then automatically leave the setting screen.

5.4 Frequency setting

In the standby or output state, press FSET and or key to adjust the frequency value (APS5000A ^ column only). At the same time, it can also be set by adjusting the knob. In the range of 45 ~ 250HZ, the minimum change is Q1HZ / STEP, (others are the same as the voltage setting method).

5.5 High and low voltage switching

The voltage high / low switch button, when the low-level output, the rated current of the output is large, and when the high-end output, the rated current of the output is halved (refer to Chapter 3 Product Specifications). Switching the high / low range will not affect the voltage setting value, but if switching when the input is ON , the output will be temporarily powered off (at least 20mS) , and it should be avoided as much as possible. Unreasonable switching will not be accepted by the Model Version (for example, if the voltage is set to 300V, you want to switch to low gear).

5.6 Current limit setting

Press the ISET key in standby or output state to display the preset current limit value, if you press the "eight" or key again to adjust the value, (others are the same as the voltage setting method).

When the output current exceeds a set value, the machine buzzer alarm, stops output, ON / OFF of the LED blink, by ON / OFF for key reset.

5.7 P/PF Selection Key

Press the P / PF selection key at any time to select the power or power factor to be observed.

5.8 ON/OFR

The ON / OFF state of the output can be switched. When the ON / OFF light is on, there is output, and when the light is off, there is no output. When the output is abnormal, the output will be turned to the OFF state. The ON / OFF

LED indicator flashes. If you press the first button to clear the buzzer alarm, press the second button to reset the error message and restore the output.

5.9 M1. M2. M3. M4. M5

Five groups of memory modes (three groups for APS5000A series) can store the setting state of voltage and frequency in any group of memory modes. To memorize, press and hold any key of M1, M2, M3, M4, M5 for more than one second, the indicator flashes, then it can be stored in the memory. To call / click any one of M1, M2, M3, M4, M5 You can call the stored memory condition.

5.10 Setting of system parameters

In the OFF standby state, press the "SYSTEM" button on the panel to enter the parameter item setting, press the "eight" or button to change the selection of the item setting (APS4000A series can be changed by turning the knob left and right Select), press the "SYSTEM" button will turn to the next parameter setting item, as shown below:

The baud rate, communication protocol, and communication address settings are invalid for the APS4000 series. For communication, please select the APS5000A series

Show small content	Description of content
bPS	Set the baud rate, use the up and down keys to change the setting, in order: 2400 , 4800 , 9600 , 19200 , 38400
LocH	Press K to set K, Lake to open, PFF "to be off, and F to F to only "ON / OFF " , and " SYSTEM " button.
P-UP	Power-on output state setting, " off" means no output, " ON" means automatic power-on output, and "last" means the last state
PLc	Communication protocol selection, use the up and down keys to change the setting "0" to close the communication function, ASCII protocol , "2" to Hex protocol
AnGLE	Not yet developed
S-LE	Output delay setting, use the up and down keys (knob) to change the setting (in seconds)
Add	Communication address setting, use the up and down keys (knob) to change the setting ª 1-30 ʷ

Precautions:

• Before using this instrument, please read this operating manual carefully and completely.

• The instrument must use a power cord and output cord that meet the rated voltage and current standards.

• The input and output cables of the instrument must be in good contact to avoid fire due to poor contact.

• The instrument is prohibited to be used in flammable, explosive or corrosive environments.

• The instrument must be operated within the range that the operator can monitor. The power supply should be cut off when there is no personnel monitoring to ensure the safety of personnel and property.

• Connect the load to the output terminal, and confirm that everything is correct before turning on the power output switch.

• the machine with overload or short circuit protection device to protect the circuit when the overload or short circuit immediately starts (the machine automatically cut off the power supply output, an alarm buzzer sound and the alarm indicator light,), the first output switch OFF, to check whether the use of overloading . (If there is overload, please reduce the load) Reset again. After everything returns to normal, confirm that it is correct before you can continue to use it.

Chapter 6 Appendix Information

6.1 Fault repair

1. Phenomenon: No voltage output, all display lights on the panel are off.

Reason: No power input

Exclusion: A, check switch is turned on.

B, check the fuse is blown.

C, the input power is properly plugged into the socket or power outage.

2. Phenomenon: No voltage output, frequency meter display flashes, voltage display "0" and buzzer sound

Causes: A, overload or abnormal load.

B, the load starting current is too large.

Exclusion: Turn off the switch, press ON / OFF, after reducing or checking the load, just turn on the output switch.

3. If there is a failure that cannot be eliminated, please notify the maintenance department of our company, and we will do good after-sales service for you.

6.2 Product maintenance

1. The quality guarantee period of this product is twelve months, during which non-human faults can be guaranteed free of charge.
2. If the quality guarantee period is exceeded, only Victoria's cost will be charged.
3. Long-term tracking and service, and establish files for customers.
4. Can undertake customized batches and special specifications.

6.3 APS5000A series product communication protocol

Agreement 1

Instruction list:

Integer Reader Command

instruction	Parameter range	Explanation
?MAXPOW		Machine power
?MAXVOL		Maximum voltage of the machine
?MAXCUR		Maximum current of the machine
?MAXFRE		Maximum frequency of the machine
?MINFRE		Machine minimum frequency
? MODEL		Read machine model

instruction	Parameter range	Explanation
PON		start up
POFF		stop
SVOL n		Set voltage
SFRE n		Set frequency
SCUR n		Set current
? SVOL		Read current set voltage
? SFRE		Read the current set frequency
? SCUR		Read current set current
? MVOL		Read current measurement voltage
? MFRE		Read the current measurement frequency
? MCUR		Read current measurement current
? MPF		Read the current measured PF value
? MP0W		Read current measurement power
SSHIFTL		Switch low gear
SSHIFTH		Switch upscale

Remarks: The communication protocol can be selected in the "PLC" item in the "SYSTEM" menu. Use the up and down keys to change the setting. "0" is to close the communication function, "1" *is the* ASCII protocol, and "2" is the Hex protocol.

Agreement 2

The format of the host computer (PC) sending data to the power supply:
Device number ID (1 byte) + command code (1 byte) + operation code (1 byte) + data (4 byte) + check code (1 byte)

Device ID	1-28		ID number corresponding to each inverter power supply
Command code	ASCII	HEX	
	R	0x52	Read data
	W	0x57	Write data
	X	0x58	Software reset
Opcode	There is a description behind		Operation object
data	The low byte is in the front, the high bytes are in the back, there is a detailed description later		Write command: data written to the lower computer
			Read command: data returned to the host computer
			Reset command: ignored
Check code			Sum of the first 7 bytes of data

1. The data format of the power supply response to the host computer:

Device number ID (1 byte) + command code (1 byte) + operation code (1 byte) + data (4 byte) + check code (1 byte)

Device ID	1-28		ID number corresponding to each inverter power supply
Command code	ASCII	HEX	
	R '	0x52	Read response
	W	0x57	Write response
Opcode	There is a detailed description later		Operation object
data	The low byte is in the front, the high bytes are in the back, there is a detailed description later		4- byte data returned
Check code			Sum of the first 7 bytes of data

Note: The power supply will not return the response command after receiving the software reset command.

2. Instructions

Opcode	Function Description	the data shows		Meaning of reading data	Write data meaning
0x30	Output status	byte	Whether the current is overloaded	1 : Current overload 0 : normal	0 : clear current overload sign
		Byte 1	Power failure alarm	1 : Power failure 0 : normal	1: Reset to clear the alarm mark
		Byte 2	Is it currently in high-end or low-end	1: high-end 0: low gear	be ignored
		Byte 3	Whether to output	1: output 0 : No output	be ignored
0x31	Target frequency	Frequency value of 4 bytes, unit 0.1 H B range 450-1200		Current frequency value	Updated frequency value
0x32	High-end target voltage	4 -byte value of the voltage, the unit of 0. The 1V, range 0-3000		Current voltage value	The updated voltage value, if it was low gear before, it will also switch to high gear
0x33	Automatic target voltage	4 -byte value of the voltage, the unit of 0. The 1V, range 0-3000		Current voltage value	The updated voltage value will switch between high and low gears according to the value of the set voltage. The standard for the switch is: set the voltage to 1500 to upshift, otherwise low

0x34	Maximum output current	Current value of 4 bytes, unit 0.001 A, not higher than 30000	Current threshold	Current threshold
0x35	Control output	4- byte output (read operation is valid)	1: output	Enable output
			0 : not output	
0x36	Control output	4 bytes of output status value (read operation is valid)	1: output	Output prohibited
			0 : not output	
0x4A	serial number	4- byte serial number	serial number	Not writable
0x60	Irms	4- byte current root mean square value, unit 0.001A	Square root value	Not writable
0x61	Vrms	4 bytes of voltage root mean square value, unit 0.1V	E-government root value	Not writable
0x62	Ipeak	4- byte peak current, unit 0.001A	Peak current	Not writable
0x63	Vpeak	4- byte voltage peak, unit 0.1V	Voltage peak	Not writable
0x64	Pva	4 bytes of the apparent power, the unit of 0.1 VA	Apparent power value	Not writable
0x65	Pw	4 -byte Active power of 0. 1 W	Active power value	Not writable
0x66	Pf	4- byte power factor, unit 0.001	Power factor value	Not writable
0x67	Freq	4- byte frequency value, unit 0.1 Hz	Measuring frequency	Not writable

3. Illustration (assuming ID number is 0x01, the following are 16 hexadecimal):

(1) Set the automatic gear voltage 120V: 01 57 33 B0 04 00 00 3F successful response: 01 57 33 B0 04 00 00 3F.
(2) Provided autopilot voltage 240V: 01 57 is 09 0000 3360 of the F4 success response: 01 60 0900 00 57 is 33 is the F4.
(3) Setting grade voltage 120V: 01 57 is 32 B0 04 00 00 3E success response: 01 57 is 32 B0 04 00 00 3E.
(4) Setting grade voltage 240V: 01 32 60 09 00 00 57 is F3 success response: 01 32 60 09 00 00 57 is F3.
(5) Set the frequency 60Hz: 01 57 31 58 02 00 00 E3 successful response: 01 57 31 58 02 00 00 E3.
(6)Output ON: 01 57 35 00000000 8D successful response: 01 57 35 01 000000 8E.
(7)Output OFF: 01 57 is 3.6 billion 8E success response: 01 573.6 billion 8D.
(8)Clear fault (CLEAR): 01 57 30 00 01 00 00 89 successful response: 0,157,300,000,000,088.

4. Send instructions:

(1) The data (voltage) and (frequency) must be sent first, and then the power supply (ON) is output, and the power supply responds immediately when sending data during output.
(2) Send (OFF), the power supply stops outputting.
(3) If the output short circuit or power failure, the transmission (the CLEAR), to clear the fault, the output is stopped.