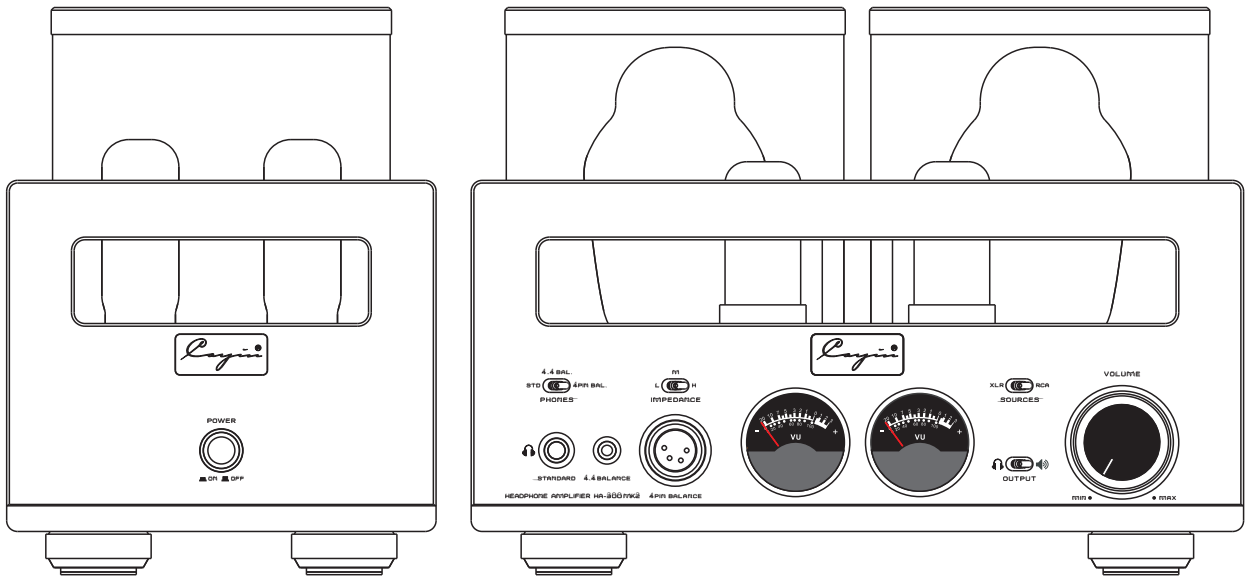


Cayin®



HA-300 MK2 | HEADPHONE AMPLIFIER

User's Manual

REV: 1.0



Thank you for choosing Cayin HA-300 MK2 Direct Heated Triode Tube Headphone Amplifier

We have inserted protective foam inside the Vacuum Tube Cage in order to protect the vacuum tubes during transportation. Please remove these foams before you connect the amplifier into your sound system. Fail to do so might cause serious damage to the amplifier or disaster such as fire accident.

We have prepared this user manual to help you understand the features and get familiar with the operation of the amplifier. We suggest all customers read through this manual before they start to use the device.

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Package Contents

Please place the box in upright position according to the marking of the package. Please examine the product package before you open it, the package should be free from any physical damage or water stain. You should find the following items when you open the package:

1. Cayin HA-300 MK2 x1
2. Product User Manual x1
3. Warranty Card x1
4. AC Power Cord x1
5. Umbilical Power cable x1
6. Spare Fuses:
 - ①.External Main Fuse x2 (~ 220V-240V : T1.6AL250V; ~ 100V-120V: T3.15AL250V)
 - ②.External Fuse for 300B Tube x4 (T100mAE250V)

Safety Precautions

1. Unplug the power cord if you are not going to use the product for an extended period of time.
2. The machine will become hot after working for a long time. Please keep the unit's ventilation open and install the amplifier at a well-ventilated place to avoid troubles and fire hazard.
3. Forbidden to operate when the output is open or shorted.
4. Do not attempt to service this product yourself. Opening the cover may expose you to dangerous voltage or other hazards.
5. We are not responsible for any problems caused by checking and opening without permission of our company. For service, Please contact a qualified service technician.
6. Do not place any objects filled with liquids such as vases or some others on the top or around.
7. Clean only with dry cloth.
8. Please move the amplifier carefully not to drop the unit or be subject to other strong shocks.

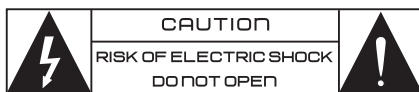


Product Features

- ◆ TUNG-SOL 6SN7GTB x 2 for voltage amplification (driver tube).
- ◆ Gold Lion Genalex PX300B x 2 for single-ended class A power amplification (output tube).
- ◆ RCA 22DE4 x 4 vacuum tubes for high voltage rectification.
- ◆ Balanced (XLR) and single-ended (RCA) input.
- ◆ High-quality Neutrik 6.35mm single-ended, Nippon Dics 4.4mm balanced, Neutrik 4-pin balanced headphone socket.
- ◆ High, Medium and Low, three levels of impedance options, perfectly match the impedance of various headphones to ensure optimal performance.
- ◆ Powerful headphone output, handle demanding headphones with ample headroom.
- ◆ Upgraded version of toroidal power transformer in-house designed and manufactured for HA-300MK2.
- ◆ Upgraded version of the high-quality frequency response EI output transformer in-house designed and manufactured for HA-300MK2.
- ◆ Purist tube circuitry fully handmade with point-to-point welding.
- ◆ Outboard power supply provides pure and steady power for the amplification circuit with minimum interference.
- ◆ Independent graded power supply, voltage amplification circuit adopts independent voltage regulated power supply, which effectively minimizes the interference to the power supply, and ensures the optimal performance of the amplification circuit and best acoustic fidelity.
- ◆ Improved circuit ensures the purity of the music and the distinctive charm of the single-ended amplification circuit.
- ◆ Premium grade AUDIOCAPX (MultiCap) coupling capacitor improves resolving capability and soundstage.
- ◆ High-Precision JRC MUSES72320V electronic volume controller with 41-steps ALPS balanced potentiometer to provide low noise and accurate volume control.
- ◆ A set of speaker terminals as alternative output.
60sec startup delay circuit to enhance circuit protection and minimize pop noise when startup.
- ◆ Lock on and quick-release aviation grade copper connectors with silver plated Teflon umbilical cable provides low internal resistance, low dissipation, and more stable transmission for outboard power supply connection.
- ◆ High-quality anti-shock buffer between critical tube components, chassis mainframe and tube socket, remove microphonic of 300B direct-heated triode effectively and provide quiet and realistic playback from sensitive headphones.
- ◆ Proper layout of the internal components and isolation shielding to ensure excellent performance of the amplifier.
- ◆ Detachable vacuum tube shielding cage, easy to detach and install.

Specifications

TYPE	ITEM	SPECIFICATIONS
Headphone Output	【Rated Output】	STD 1200mW+1200mW (L) ; 2200mW+2200mW (M) ; 5000mW+5000mW (H)
		4.4 BAL. 800mW+800mW (L) ; 2000mW+2000mW (M) ; 4500mW+4500mW (H)
		4PIN BAL. 2000mW+2000mW (L) ; 2400mW+2400mW (M) ; 6000mW+6000mW (H)
	【Frequency Range】	10Hz~45kHz ±3dB
	【TH+D】	1%(1kHz)
	【Sensitivity】	200mV~650mV
	【S/N Ratio】	100dB (A-Weighted)
	【Headphone	L: 8~64Ω; M: 65~250Ω; H: 251~600Ω
【Headphone	6.35mm x1 ; 4.4mm BALANCEx1; 4pin XLR x1,	
Speaker Output	【Rated Output】	8W+8W
	【Frequency Response】	10Hz~40kHz ±3dB
	【TH+D】	1%(1KHz)
	【S/N Ratio】	95dB (A-Weighted)
	【Input Sensitivity】	400mV
	【Output Impedance】	4~8Ω
	【Input Impedance】	50kΩ
Others	【Input Connector】	XLR,RCA
	【Tube used】	TUNG-SOL 6SN7GTB×2, Genalex PX300B×2, RCA 22DE4×4
	【Dimension】	Power Supply: 159×345×210mm ³ AMPLIFIER : 286×368×210mm ³
	【Net Weight】	Power Supply: 10KG AMPLIFIER: 19KG
	【Fuse】	~ 220V-240V : T1.6AL250V; ~ 100V-120V: T2.5AL250V
	【External Fuse for 300B】	T100mAE250V
	【Power Consumption】	185W
	【Working Condition】	Temp : 0°C ~ 40°C Humidity : 20% ~ 80%
【Storage Condition】	Temp : -20°C ~ 70°C Humidity : 20% ~ 90%	



- ◆ To reduce the risk of electric shock, do not remove the cover.
- ◆ No user serviceable parts inside. Refer servicing to qualified service personnel.
- ◆ To reduce the risk of fire or electronic shock, do not expose the unit to rain or moisture.



The lightning flash with arrowhead symbol is intended to alert user to the presence of uninsulated “dangerous voltage” within the product's enclosure that may be of a risk shock to persons.



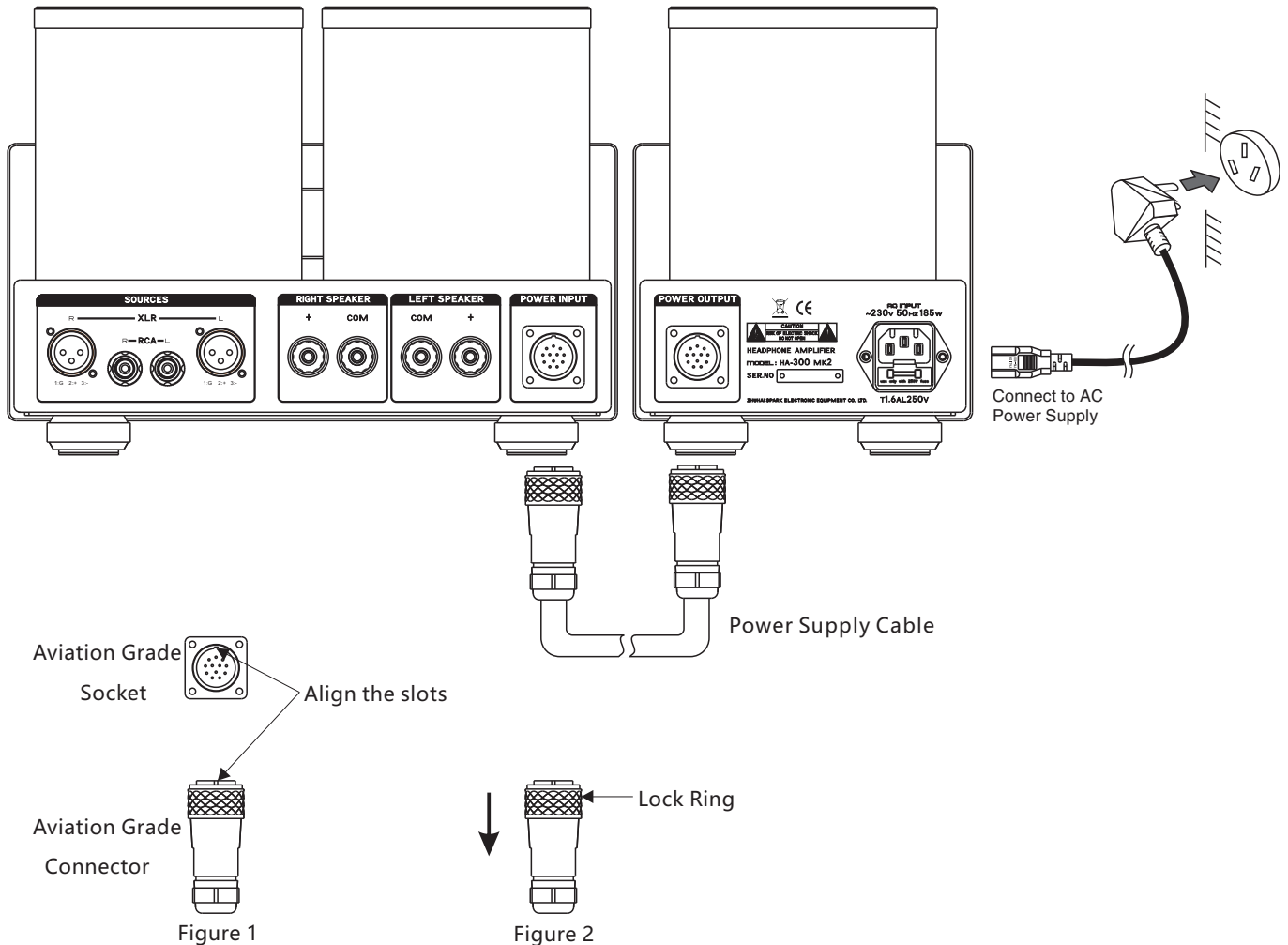
The exclamation point is intended to alert user to the presence of important operation and maintenance (servicing) instructions accompanying the appliance.

Recommendation: Cayin HA-300 MK2 Direct Heated Triode Tube Headphone Amplifier is designed and manufactured with our original parts and reaching the best results. We are not responsible for problems and damages caused by non-original parts replacement in the amplifier. Please keep all packaging materials for future use as you may need to repackage the amplifier in the future.

Please fill in the product warranty card immediately and mail it to authorized dealer to safeguard your after- sales service.

Note: Please make sure local voltage level is matched with the input level of the amplifier, which indicates on the rear panel. Too low or too high voltage may cause problem. Please contact our company or our local agent if you've found improper voltage.

Precautions



1. Connecting the power supply unit and AC socket.

After connected amplifier with the speakers and audio source, connect the quick-release power supply cable between the main unit and the outboard power supply unit, then connect with power supply unit to an AC power supply socket with the power cable.

2. Connecting and disconnecting of the quick-release power supply cable.

Connecting: Align the slots (marked with the red dot) of the connector with the slot (marked with the red dot) of the socket of the power input/output on the machine (Figure 1), and plug the power cable to connect.

Disconnecting: Firmly hold the lock ring of the connector and pull it out (Figure 2), the power supply cable would be disconnected.

There should be sufficient space around the power outlet to facilitate plugging and unplugging the power cord.

Front Panel Functional Description

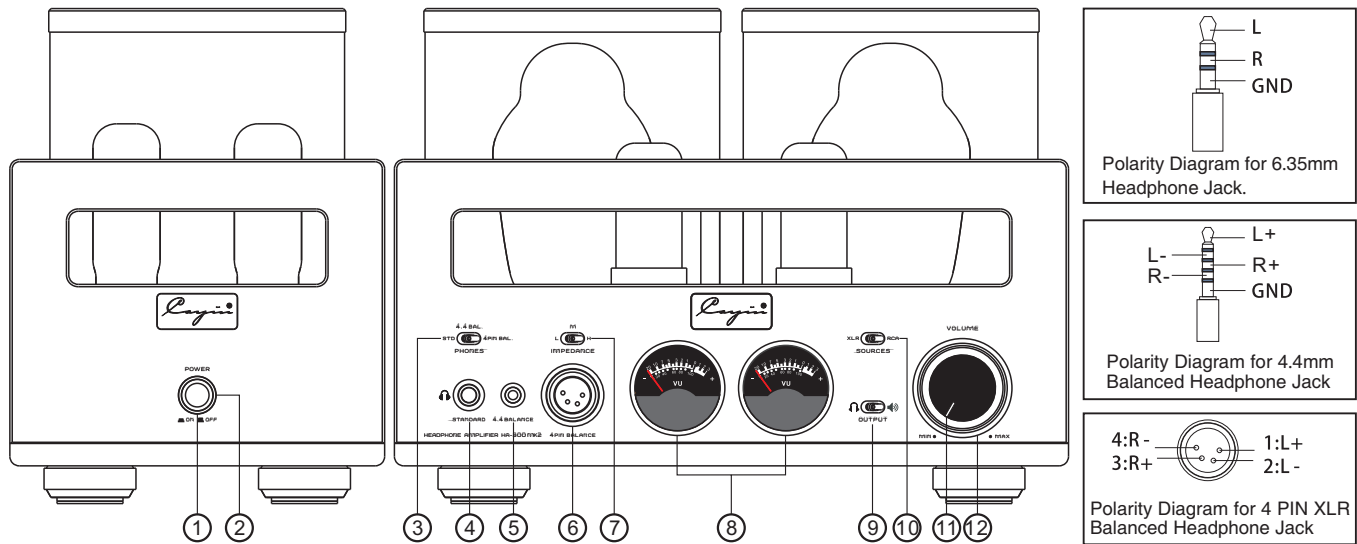


Diagram 1: HA-300 MK2 Front Panel

- ①. **Power On/Off:** Turn on and off the amplifier. Press “down” the button to turn on the amplifier, Press again the button will resume to original position and the amplifier will power off.
- ②. **Power Indicator:** Indicate the working status: The indicator will remain always on when the amplifier is in regular operation
- ③. **Headphone Output Selector:** With the switch you can select the suitable type of headphone output. HA-300 MK2 offers three types output.
- ④. **STANDARD:** Output for headphones terminated in 6.35mm TRS connector
- ⑤. **4.4 Balance Output:** 4.4 balance output for headphone terminated in 4.4mm connector.
- ⑥. **4PIN BALANCE:** Output for headphones terminated in 4pins XLR connector
- ⑦. **IMPEDANCE:** Select the most desirable: impedance-matched output from the amplifier, three options were offered: (L:8~64Ω; M:65~250Ω; H: 251~600Ω)
- ⑧. **VU meter:** monitor output level of the amplifier
- ⑨. **Triode/ Ultralinear Indicator**
When the TR Indicator is on: Triode working state
When the UL Indicator is on: Ultralinear working state
- ⑩. **SOURCES:** select balanced or single-ended input
- ⑪. **Working State Indicator/Mute Indicator**
Used to indicate the working state. The indicator will be on when it is working normally. The indicator will flicker for 30 seconds when it delays to work. The indicator will keep flickering when it is at mute state.
- ⑫. **Volume Knob**
Used to control volume

Attention:

- ◆ If your want to connect a 3.5mm terminated headphone to the amplifier, you need a 3.5mm to 6.3mm adapter (not included in the package).
- ◆ Listening through headphones at a high volume for extended periods of time can result in hearing impairments.
- ◆ Please do not use mono (TS) phone plug with this amplifier as this might cause serious damage such as short circuit in the amplifier.
- ◆ Please unplug the power plug from AC power circuit if the amplifier is not used for a long time

Rear Panel Functional Description

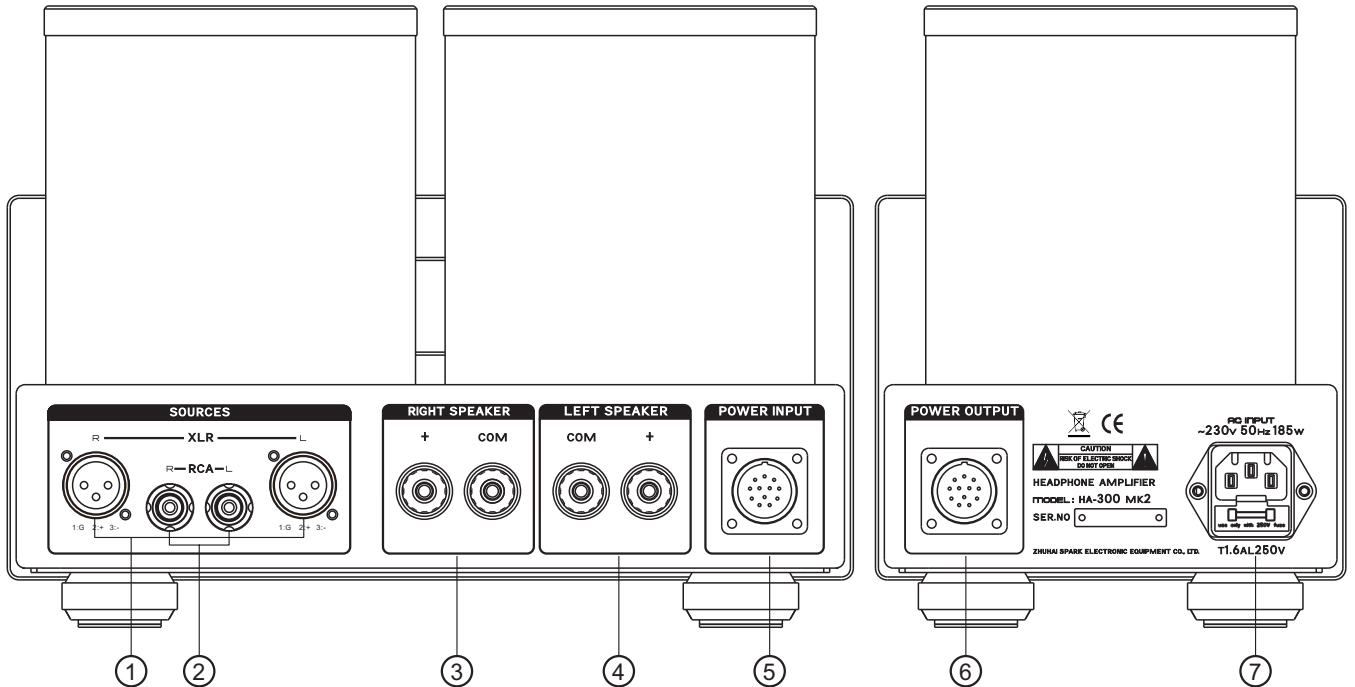


Diagram 2: HA-300 MK2 Rear Panel

①. Balanced input (XLR)

Connect a balanced audio input to the amplifier. Please make sure the left and right channel is connected correctly

②. Single-ended input (RCA)

Connect a single-ended audio input to the amplifier. Please make sure the left and right channel is connected correctly

③. Right Channel Speaker Terminal connect to the right channel speaker

④. Left Channel Speaker Terminal connect to the left channel speaker

⑤. Power Input for Amplifier chassis

⑥. Power Output from power supply unit

⑦. **AC Power Input with Fuse Holder:** please replace fuse with the same specification

Attention:

Please make sure the AC voltage of your local power supply match the voltage of the amplifier. Cayin will not be responsible for the damage or accidents such as fire caused by incorrect input voltage

Top Panel Functional Description

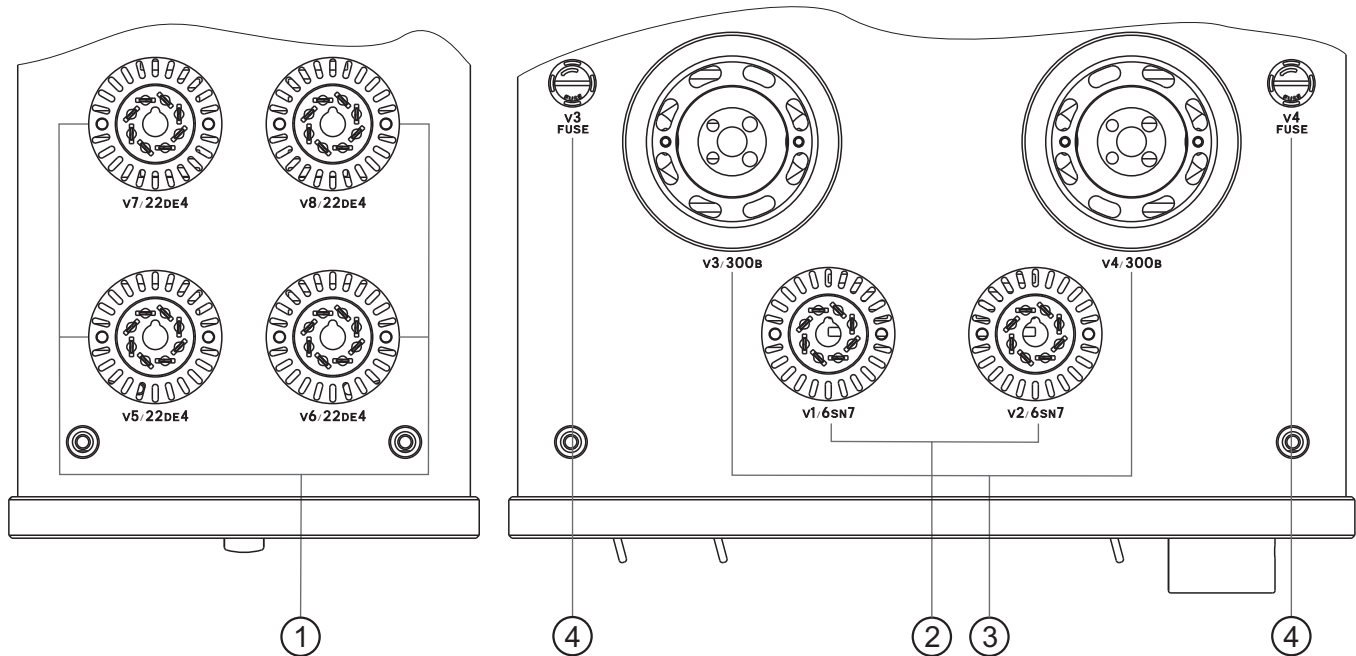


Diagram 3: HA-300 MK2 Top Panel

- ①. **V5、V6、V7、V8:** RCA 22DE4 Vacuum Tube
- ②. **V1、V2:** TUNG-SOL 6SN7GTB Vacuum Tube
- ③. **V3、V4:** Genalex PX300B Vacuum Tube
- ④. **V3、V4** 300B Vacuum Tube fuse

Attention:

- ◆ The vacuum tube will become very hot during operation, please be careful and don't get burned.
- ◆ Please turn off the amplifier for 20 minutes before replacing the vacuum tube. Hold the base of vacuum tube firmly and to avoid damaging the fragile part of the vacuum tube.
- ◆ When install vacuum tube to the amplifier, position the vacuum tube correctly according to the alignment pin before push the vacuum tube base into the socket.
- ◆ Only used matched pair 300B and 6SN7 in the HA-300 MK2 amplifier.

Vacuum Tube Substitution

Vacuum Tube	Acceptable Substitution
RCA 22DE4	22DE4
TUNG-SOL 6SN7GTB	6SN7GT、6H8C、ECC32、6N8P、CV181
Genalex PX300B	300B

System connection

Connection method of **CAYIN HA-300 MK2** with other audio equipments Take pictures below for your reference.

I. Speaker Connection:

1. Check the impedance of your speakers. When using a pair of speakers, you can use speakers with an impedance of between 4 and 8 ohms. **BE SURE TO USE THE MATCHING TERMINALS.**
2. Please notice the polarity of the cable and do not mix up the positive and the negative ends.

NOTE:

- ◆ Connect the speaker cables with the amplifier after it is well connected with the speakers.
- ◆ Connect both of the speakers to make sure of the acoustic fidelity.
- ◆ Please notice the signal direction indication of the cables.
- ◆ Do not mix up the positive and negative ends of

speaker cables or it will cause short circuit.

II. Audio Connection:

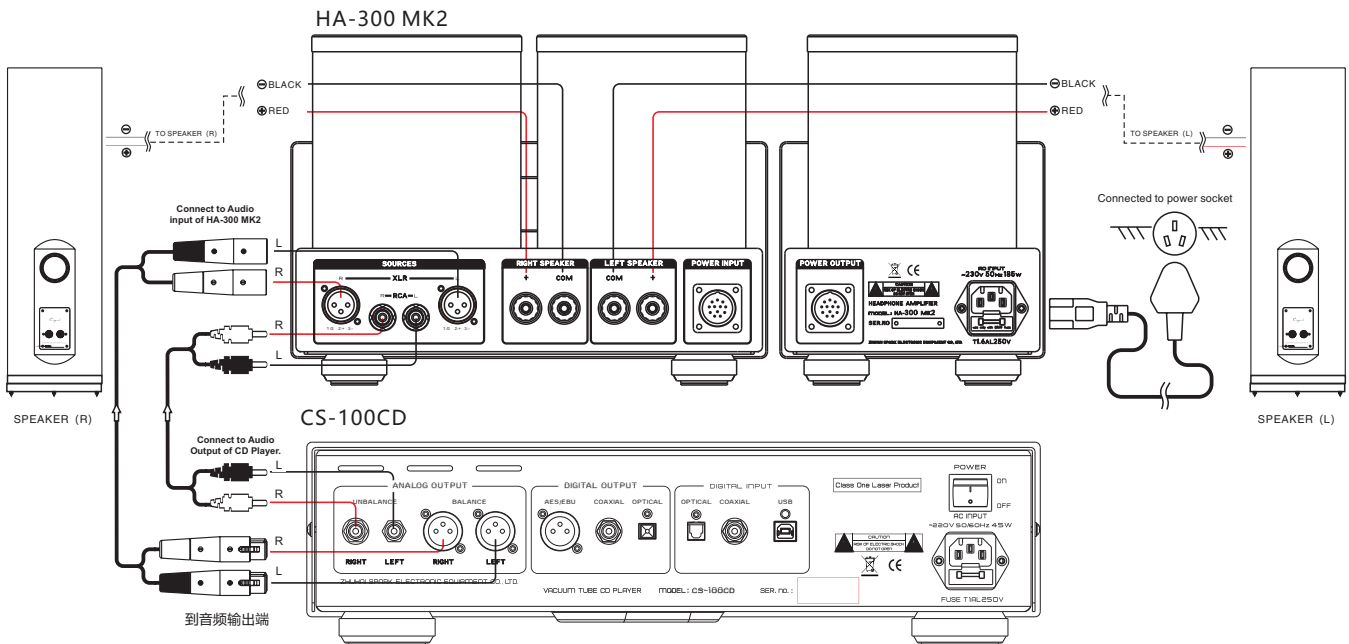
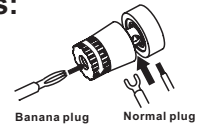
1. Please refer to the manuals of other connected equipments during the installation.
2. R refers to right channel while L represents left channel.
3. Do not fasten signal cable together with power cable and speaker cables. It will worsen the acoustic fidelity.

III. Connection of power cord:

Connect the speaker cables and signal cables first and then insert the power cord into the power socket.

IV. Connection of speaker cables:

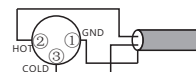
1. Unscrew the terminal knob
2. Insert the speaker cable
3. Screw the terminal knob



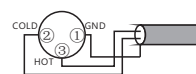
BALANCE Socket:

1. The BALANCE socket is with XLR input. The functions are following:
 - ◆ Music signal is transferred as balance signal without the outside disturbance.
 - ◆ Professional XLR connectors are used to raise reliability of connection.
2. In the following two systems, professional XLR connectors are used for inside connection.

- a. **USA System:** ① PIN1 : GND;
② PIN2 : HOT;
③ PIN3 : COLD



- b. **European System:** ① PIN1 : GND;
② PIN2 : COLD;
③ PIN3 : HOT



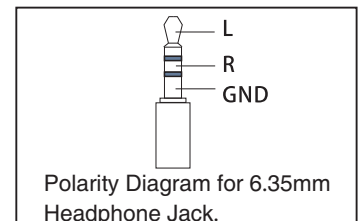
3. This amplifier uses the a USA System.
If the XLR balance connector is used by European system, the restored signal of pre-amplifier or main amplifier will be inverse. Therefore, please setup the correct phase in advance.

Connect to Headphones

Selecting Headphone Connection provided three types of headphone output: 4-pins XLR for balanced, 4.4mm Balanced, 6.35mm for single-ended, we have optimized the headphone amplifier to perform satisfactory for all outputs, user are free to use any headphone output according to their need without worrying one is better than the other.

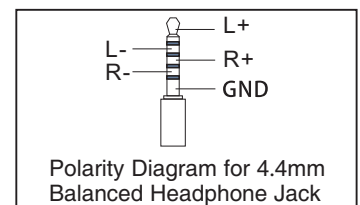
Single-ended Headphone Connection

- HA-300 MK2 provides one set of 6.35mm headphone input, the pin definition of the headphone connector is as illustrated.
- Headphones terminated with 3.5mm connector will require a 3.5mm to 6.35mm adapter in order to use it with this headphone amplifier.



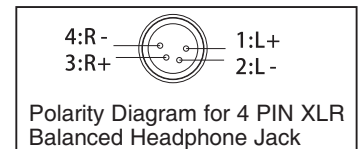
4.4mm Balanced Headphone Connection

- HA-300 MK2 provides one set of 4.4mm headphone input, the pin definition of the headphone connector is as illustrated.
- Headphones terminated with 2.5mm connector will require a 2.5mm to 4.4mm adapter in order to use it with this headphone amplifier.



XLR Balance Headphone Connections

- HA-300 MK2 provide one set of 4-pin XLR headphone input, the pin definition of the XLR connector is as illustrated.
- Headphones terminated with dual XLR (3-pins), 4.4mm or 2.5mm balanced headphone connectors will require corresponding XLR4 adapter in order to use it with this headphone amplifier.



IMPEDANCE matched output

- Headphones are currently available from 8 to 600 , in view of this wide range of impedance rating, HA-300 MK2 provides three sets of impedance matched outputs (L:8~64 ; M:65~250 ; H: 251~600) to ensure the headphone amplifier can handle vast variety of headphones satisfactory.
- We recommend users to start with the output setting that match the impedance rating of your headphone.
- It is technically safe to select any impedance setting for your headphone. You can try other impedance setting without worrying causing any damage to your headphone.

Attention:

- ◆ Balanced headphones can convert into single-ended headphone with appropriate converter and use the 6.35mm headphone output.
- ◆ Single-ended headphone cannot use an adapter to plug into the XLR4 balanced headphone output of the HA-300 MK2, it can cause damage to your headphone and/or headphone amplifier.
- ◆ Turning the volume to the minimum when you exchange the Headphone.



Turning On

Before turning on the amplifier please make sure all connections are right and power supply is stable.

- ◆ Turn on the amplifier, the power indicator will be on and the working indicator will keep flickering.
- ◆ The working indicator will be on after 60 seconds. It means that the amplifier is working normally. If the working indicator is off, please turn off the power and contact with our local agent or our company.
- ◆ Select the right audio source channel, adjust the volume to a certain position and then you can enjoy the music you prefer.

NOTE: 1. When the audio system is under working state, don't unplug the signal cable or speaker cables, or it will cause damage to the amplifier and other equipments.
2. It should at least takes 2 minutes before you turn on the power again, or it will cause damage to the vacuum tubes.

Small Tips

Read the Manual — Please read the user's manual carefully before installation and operation.

Keep the Manual — Please keep the manual for future reference.

Warning Signs — Don't tear off or rub off the serial number.

Operation — Do the operations as you are instructed in the Manual.

Parts — If you are going to use parts not supplied by our company like power cord, fuses etc please make sure that parts you used are compatible with the safety requirements. Or it will cause fire or electric shock.

Placement — Put the amplifier on a level place. Make sure that it doesn't bring damage to the children, adults and the amplifier itself.

Power — Please make sure the local voltage is the same level as indicated on the rear panel.

Overload — If the power socket is overloaded with other equipment, it will cause fire or electric shock.

Warranty Service — Do not open the product and change the components inside yourself. Opening the cover may expose you to dangerous voltage or other hazards. The warranty doesn't extend to any product that has been opened by you without permission of our company.

Troubleshooting — If you encounter any abnormal behavior during setup or playback, please refer to the advice in next pages of this manual to recover your amplifier back to normal operation. If you fail to rectify the problems after that, please contact your authorized dealer for technical support.

Warranty Service

1. The Product is warranted for a period of twelve (12) months from the date of original purchase (the "Warranty Period"). Replacement Products are warranted for the remainder of the original twelve (12) month warranty period. Six-month warranty on stock vacuum tubes.
2. The defective product must be returned to your dealer or our company for repairing when your dealer or our company accepts your requirement.
3. The warranty doesn't extend to any product that has been opened by you without permission of our company.

NOTE: The information in this manual is subject to change without further notice.

Basic Operation

Please make sure all connections are correct and power supply voltage is stable before turn on the amplifier.

1. Turn on the amplifier, the power indicator will light up.
2. When the power indicator remains lighted up steadily, the amplifier is ready for operation. If the power indicator will become steady (always ON). It means that the amplifier is ready for operation. If the power indicator did not light up, the amplifier is malfunction, please turn off the power and contact your local dealer for service support.
3. The tubes regulated power supply might require around 30-60 seconds to ramp up the voltage gradually, it is normal if you heard ting-ting noise from your headphone or speaker during this time.
4. The vacuum tube might require 10 minutes of warm up before they reach optimum performance.
5. Select your input source: XLR for balanced input, RCA for single-ended input.
6. If you are using single-ended headphone, insert the 6.35mm connector of your headphone into the STANDARD headphone output on the front panel. Switch the headphone output selector (PHONES) to STA.
7. If you are using a 4.4mm balanced headphone, insert the 4.4 connector of your headphone into the 4.4 BALANCE headphone output on the front panel. Switch the headphone output selector (PHONES) to 4.4 BAL.
8. If you are using a 4pin XLR balanced headphone, insert the XLR4 connector of your headphone into the 4 PIN BALANCE headphone output on the front panel. Switch the headphone output selector (PHONES) to 4 PIN BAL.
9. Select the appropriate output (L, M, or H) on the IMPEDANCE switch according to the specification of your headphone for optimized performance.
10. Adjust Volume to appropriate level and enjoy your music.

Attention:

- ◆ Please do not disconnect your interconnect when the amplifier is operating, this might cause damage to the amplifier or associated equipment
 - ◆ You can swap headphones during playback, but to avoid damaging your sensitive headphone and protect your hearing, please turn the volume down to 0 when you unplug or plug in another pair of headphone.
 - ◆ If you have turn off the amplifier, please wait 2 minutes before you turn in on again, or it might cause damage to the vacuum tubes.
-

Troubleshooting

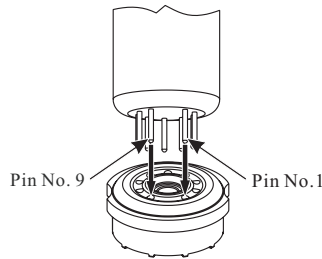
Please follow the instruction in the manual in order to keep the amplifier work in its best state. If wrongly operated and you thought that would be troubles please check according to following tips to look for the exact reasons.

Problem		Cause	Solution
No Sound after power on	Power Indicator is OFF.	Power is not connected	Connect power cord securely Check main power supply
		Main fuse is out.	Replace fuse with same specification
	Power Indicator is ON.	NO input signal .	Check source equipment is working Select input source correctly
		Volume at minimum position	Turn up volume
		Interconnect not properly connected	Connect all cables securely
		Headphone cable not properly connected	Connect headphone cable properly
		Headphone output not specified correctly	Select headphone output correctly
		Selected the wrong output	Select headphone or speaker output correctly
		Umbilical Power cable not properly connected	Reconnect the umbilical power cable, position the alignment groove correctly before tighten up the screw-threaded connector
	No sound from left or right channel	V3 or V4 300B vacuum tube fuse is broken	Replace the fuse with the same specification
		300B vacuum tube is damaged	Replace the 300B Vacuum Tube
Excessive noise	Input source badly connected	Install interconnect properly	
	Interconnect grounding disconnected	Replace interconnect	
	Equipment malfunction	Contact authorized dealer for technical support	
Soundstage and imaging not focused	Left and right channel of source equipment reversed	Reinstall related cabled correctly	
	Headphone cable polarity reversed		
	Speaker cable polarity reserved		

NOTE: *Rayii*[®] is the registered trademark of Zhuhai Spark Electronic Equipment Co., Ltd.

How to Install Vacuum Tubes

How to Install 9-Pin Vacuum Tubes

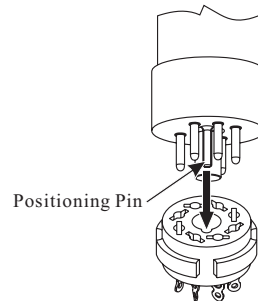


Applicable vacuum tube:
 12AU7 (ECC82)、12AX7 (ECC83)、5BK7、12BH7、
 12AT7 (ECC81)、6922 (ECC88), etc. 9-Pin vacuum tubes.

Instructions to Change and Install the vacuum tubes:
 To install a nine-pin vacuum tube, align the pins of the vacuum tube with the holes of the tube socket and insert the tube vertically up and down (as shown in the figure above).

▲ Please note that when installing the nine-pin vacuum tube, pay attention to the alignment of the vacuum tube pins with the holes of the tube socket. Otherwise wrong insertion will cause damage to the vacuum tube and prevent the amplifier from working properly, which may lead to failure of the amplifier.

How to Install 8-Pin Vacuum Tubes

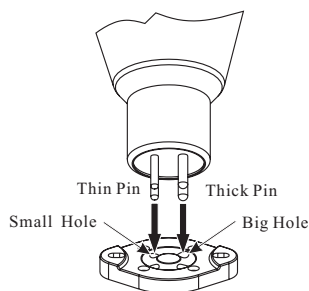


Applicable vacuum tube:
 KT150、KT170、KT88、6550、EL34、6V6、6SN7、6SL7、5AR4, etc. 8-pin vacuum tubes.

Instructions to Change and Install the vacuum tubes:
 To install an eight-pin vacuum tube, align the positioning pin of the tube with the grooves in the positioning holes of the tube socket, and install the tube by pulling up and down vertically (as shown in the figure above).

▲ Please note that when installing the eight-pin vacuum tube, pay attention to the alignment of the vacuum tube positioning pin with the positioning hole of the tube socket. Otherwise wrong insertion will cause damage to the vacuum tube and prevent the amplifier from working properly, which may lead to failure of the amplifier.

How to Install 4-Pin Vacuum Tubes

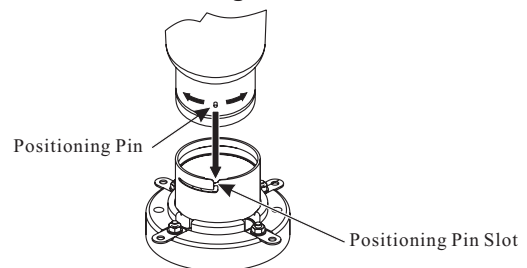


Applicable vacuum tube:
 300B、2A3 etc. 4-pin vacuum tubes .

Instructions to Change and Install the vacuum tubes:
 To install a four-pin vacuum tube, please pay attention to the thickness of different pins of the vacuum tube and the size of the tube socket hole. Thick pin should be aligned with the big hole, and the thin pin should be aligned with the small hole. Install the tube vertically up and down (as shown in the figure above).

▲ Please note that when installing the four-pin vacuum tube, pay attention to the thickness of different pins of the vacuum tube and the size of the tube socket holes. Otherwise wrong insertion will cause damage to the vacuum tube and prevent the amplifier from working properly, which may lead to failure of the amplifier.

How to Install Big 4-Pin Vacuum Tubes



Applicable vacuum tube:
 845、805、211 etc. 4-pin vacuum tubes.

Instructions to Change and Install the vacuum tubes:
 To install the big four-pin vacuum tube, align the vacuum tube positioning pin with positioning pin slot of the tube socket and then rotate 45° clockwise to tighten. (As shown in the picture above). To take out the big four-pin vacuum tube, turn the tube 45° counterclockwise and take it out upward after loosening.

▲ Please note that when installing the big four-pin vacuum tube, pay attention to the alignment of the vacuum tube positioning pin with positioning pin slot of the tube socket and then rotate 45° clockwise to tighten. It is strictly forbidden to install the vacuum tube when the positioning pin is off or missing. Otherwise wrong insertion will cause damage to the vacuum tube and prevent the amplifier from working properly, which may lead to failure of the amplifier.