

Owner's Manual

A 4000



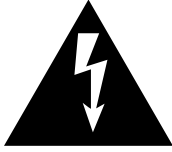
A 5000



HPA

WARNING

TO PREVENT FIRE OR SHOCK HAZARD. DO NOT USE THIS PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.
TO PREVENT FIRE OR SHOCK HAZARD. DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.
TO PREVENT ELECTRICAL SHOCK, MATCH WIDE BLADE PLUG TO WIDE SLOT FULLY INSERT.



This lightning flash with arrow-head symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

CAUTION

**RISK OF ELECTRIC SHOCK
DO NOT OPEN**

Warning: To reduce the risk of electric shock, do not remove cover (or back) no user-serviceable parts inside. Refer servicing to qualified service personnel.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

IMPORTANT SAFETY INSTRUCTIONS

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacture's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at the plugs, convenience receptacles, and at the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.



13. Unplug the apparatus during lightning storm or when unused for long periods of time.
14. Refer all servicing to qualified personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. This appliance shall not be exposed to dripping or splashing water and that no object filled with liquid such as vases shall be placed on the apparatus.
16. Caution-to prevent electrical shock, match wide blade plug wide slot fully insert.
17. Please keep a good ventilation environment around the entire unit.

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Introduction



A 4000 / A 5000

HEAVY DUTY PROFESSIONAL AMPLIFIER

Welcome.

Congratulation and thank you for the purchasing A Series, a state-of-the-art heavy duty professional amplifier.

These amplifier are designed to provide a big impact in sound reproduction and to produce the best and highest quality audio at an affordable price. We wish you great enjoyment and satisfaction when using your amplifier, whether you are an installation, or reinforcement engineer.

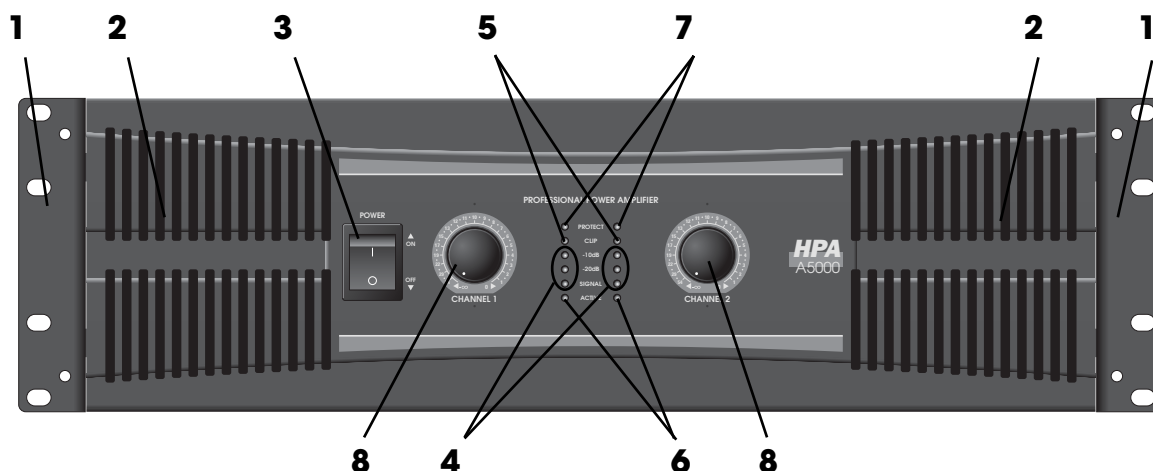
Unpacking and Installation

Although it is neither complicated to install nor difficult to operate your amplifier, a few minutes of your time is required to read this manual for a properly wired installation and becoming familiar with its features and how to use them. Please take a great care in unpacking your set and do not discard the carton and other packing materials. They may be needed when moving your set and are required if it ever becomes necessary to return your set for service. Never place the unit near radiator, in front of heating vents, to direct sun light, in excessive humid or dusty location to avoid damages and to guaranty a long reliable use. Connect your unit with the system components according to the description on the following pages.

Features

- HPA A-Series amplifier delivers the following power ratings.
A 4000 2 x 850 Watts at 8 ohm, 2 x 1400 Watts at 4 ohm and 2 x 2000 Watts at 2 ohm
A 5000 2 x 1100 Watts at 8 ohm, 2 x 1800 Watts at 4 ohm and 2 x 2500 Watts at 2 ohm
- 2-channel, parallel or bridged mono operating modes for flexible application 4000 Watts for A 4000, 5000 Watts for A 5000.
- Independent limiters for each channel reduce distortion.
- Independent input level controls for each channel allow precision adjustments.
- Precise signal and clip LED indicators to monitor performance, allow you to correct for overloading (clipping) condition.
- Low-frequency filters (30Hz or 50Hz) remove rumble and subsonic frequency.
- Twin-tunnel and two temperature-sensitivity forced-air cooling system to maintain a low, temperature working condition.
- Balanced XLR or balanced 1/4-inch TRS Combination input connector for each channel and LINK ports.
- 5-way output binding posts or Speaker connectors enable secure operation.
- High-current toroidal transformer for absolute reliability.
- Independent DC and thermal overload protection on each channel automatically protects amplifier and speaker.
- The A series can be mounted in any standard 19" rack.

Front Panel Controls



1. Rack Mounting Ears

Two front panel mounting holes are provided on each mounting ear.

2. Fan Vent

A series amplifiers are cooled by two (except for A 900) rear-mounted fans. Cool air is flowed through the front fan filters, reducing the temperature of the inside components while forcing the heat out the rear vents. Never block these vents and keep them clean at all time.

3. AC Power Switch

This switch controls the units main power.

4. Signal Indicators

These green and yellow LED will illuminate to indicate that a signal is present at the amplifier input, and that the signal is being amplified.

5. Clip Indicators

These red LED will illuminate at the clipping threshold. If it lights frequently, you maybe overloading the HPA Series and a distorted signal is probably being output. Under heavy clipping activity lower the channel gain controls to reduce the risk of damage to your speakers and amplifier.

6. Active Indicators

These blue LED indicate that AC power is connected and the amplifier is turned on.

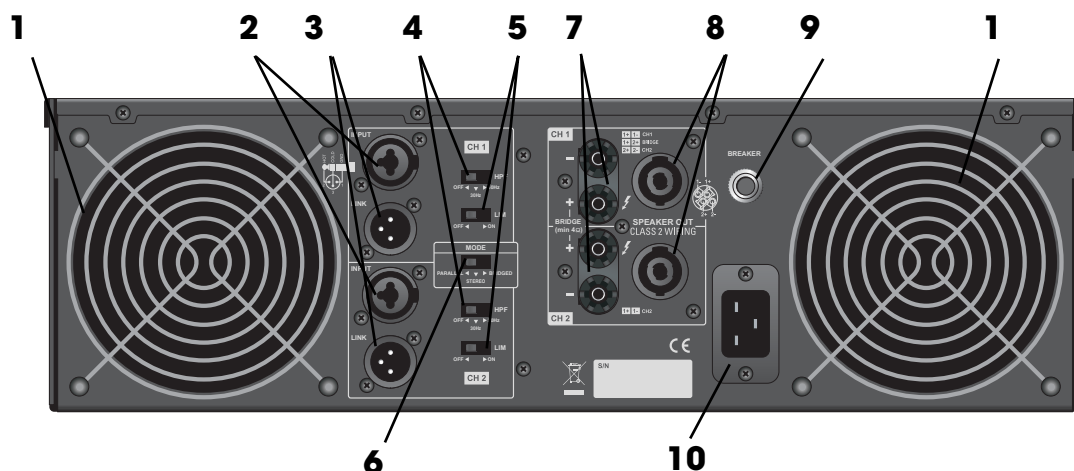
7. Protect Indicators

These red LED indicate that the channel is in Protect mode. When the channel goes into protect mode all output for that channel will turn off by output relay. The protect LED will light when overheating or other severe problem occur. This is to protect any speakers connected to the channel. These LED light for approximately five seconds whenever the A Series is powered on and to fade slowly when the amplifier is powered off. It is normal.

8. Channel input level control

These two 21-position detented controls adjust input level for their respective amplifier channels. In Bridged Mono Mode, only channel 1 input level control are used to adjust signal level. In Parallel Mode, both input level control are used to adjust signal level for their respective amplifier channels. At their fully counter-clockwise position, the signal is attenuated by more than 80dB. At their fully clockwise position, the signal is at unity gain. When 0 dBu of signal arrives at the input jacks and the Channel input level controls are set to their fully clockwise position, the A Series delivers full power output.

Rear Panel Controls



1. Fan

This is a variable speed cooling fan. Cooling air enters the amplifier through the fan ports located on front of the amplifier chassis. Be sure not to block these ports when installing the amplifier or other associated equipment.

2. Input connectors

Connect the input source to these electronic balanced Combination connectors using either XLR or 1/4" TRS plugs. The 1/4" TRS and XLR plug configured as follows : Pin 2 (Tip) hot, Pin 3 (Ring) cold, and Pin 1 (Sleeve) ground. We recommend the use of balanced three-conductor cabling wherever possible. Unbalanced two-conductor 1/4" plugs can also be inserted into these inputs, but you will get better signal quality and less outside noise and hum if you use balanced lines. Stereo signal should be connected to both the Channel 1 and Channel 2 input jacks ; however ; when operating the A Series in Bridged Mono or Parallel modes, use the Channel 1 input jack only.

3. Link connectors

These jacks is used to send a parallel signal form the channel Link jacks to another device or amplifier.

4. High Pass Filter (HPF) switch.

These slide switch are used to activate the built-in High Pass Filter.

The HPF rolls off signals below 30Hz or 50Hz. This improves bass performance by limiting sub-audio cone motion, making more power available for the speaker's rated frequency range. When the filter is turn off, a 5 Hz roll off protects against DC or deep sub-audio inputs.

5. Limiter switch

When the input signal connected to your amplifier is too high, you end up with a distorted output signal. To prevent this, both channels of your A Series features a clip limiter that can be engaged or disengaged selectively.

6. Bridge / Stereo / Parallel switch

This switch changes the amplifier operating mode from either stereo or mono bridged or parallel. You can place this switch in "STEREO" position (center) for normal stereo operation. When placed in "PARALLEL" position, the channel 1 input signal is routed to the power amplifier of both channel. When placed "BRIDGED" position, the channel 1 input signal only is routed to both amplifiers again. In this mode the channel 2 input is ignored.

7. 5-way Binding Post

Connect each channel of the A Series to 4 ohms or 8 ohms loudspeakers. Two pairs of 5-way binding posts are provided for each channel, so that paralleling of speakers is possible.

Connection to the binding posts can be made with bare wire, banana plugs, or spade lug terminations. Make connections to both the Channel 1 and Channel 2 terminals for Stereo or Parallel Mode, or a single connection across the red terminals only of Channel 1 and Channel 2 for Bridged Mono Mode.

8. Speakon output connectors

You can use these to connect each channel of A Series to 8 ohms or 4 ohms loudspeakers. Using Speakon speaker cables, make connections to both the channel 1 and channel 2 connectors for Stereo or Parallel Mode, or to the Bridged mode connector for Bridged Mono Mode.

9. Circuit breaker

The breaker acts in place of common discardable fuses. This circuit breaker will trip if there is a fault with the main voltage or if maximum output is exceeded. Simply depress the circuit breaker and power up the unit again.

10. AC input

IEC connector for AC power cable. Connect the supplied heavy-gauge 3-pin IEC power cable.

Protection

Every model in the A Series incorporates protection features. The HPA Series front panel Protection LED indicates the activity of the relay speaker connection circuitry in each channel. When the protection LED turns on, this circuitry is active, and all connected speakers are muted.

Initial power-up ; For approximately five seconds after initial power-up, the protection circuitry is activated and the speaker outputs are muted. If everything is operating normally, you will hear an audible click at the conclusion of this brief period, as the protection circuitry is deactivated and the A Series begins delivering signal to connected speakers. It is normal for the Protection LED to fade gradually after the amplifier is powered off.

Thermal Protection ; Abnormally high heat sink temperatures will engage the Protect circuitry for the overheating channel only. An output relay disconnects the speakers until normal temperature range is restored. During this time, the Protect LED will light.

To guard against this problem, make sure the A Series receives adequate ventilation on all sides and that both the front and rear panels are unobstructed. If the power transformer gets too hot, its thermal switch will disconnect all of the secondary power and disconnect both channel outputs.

Short circuit ; If output is shorted due to faulty wiring, the thermal circuitry will automatically protect the amplifier. If this will occur, the load will be disconnected by thermal protection circuitry (also output relay opens).

DC Voltage Protection ; If an amplifier channel detects DC voltage at speaker output, the output relay immediately opens to prevent speaker damage.

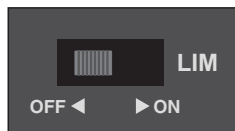
Subsonic Frequency Protection ; Built-in High Pass Filter provides subsonic frequency protection for each channel.

Current limiting Protection ; At the amplifier's full power limit, or clipping point, the limiter circuitry will be activated. This is indicated by illumination of the Clip LED. The channel gain is automatically reduced, protecting the speakers from the high power. This circuitry may be activated by uncontrolled feedback, oscillations, improper equipment gain setting. And this circuitry is virtually transparent in operation and full signal bandwidth is maintained.

Any time the Protection LED lights up (except for initial power-up during approximately five seconds), there is reason to be concerned. If this occurs, turn the amplifier off immediately and check carefully all wiring and external equipments in order to locate and correct the condition.

Setup

Clip limiter

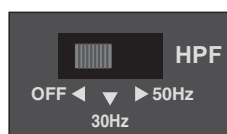


Clip is the result of an amplifier running into power supply limitation. The maximum output voltage that any amplifier can produce is limited by its power supply. Attempting to output a voltage (or current) level that exceeds the power supply result in a flattening effect on the signal, making it look cut off or “clipped”. A clipped waveform exhibits extreme harmonic distortion, dominated by large amplitude odd-ordered harmonics making it sound harsh or dissonant.

The clip limiter detects this and reduce the gain to minimize the amount of overdrive. To preserve as much of the program dynamics as possible, limiting reduces the average program level until peaks barely clip. Each channel has its own clip limiter, and you can switch it on or off.

When driving full-range speakers, clip limiting reduces high frequency distortion caused by bass overload. It also protects higher frequency drivers from excess overdrive and harsh clipping harmonics.

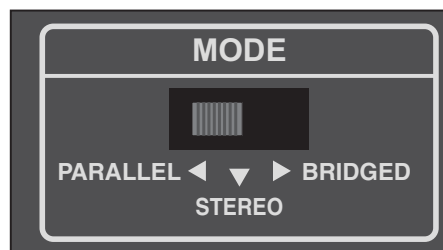
HPF (Hi-Pass Filter)



A filter having a passband extending from some finite cutoff frequency (not zero) up to infinite frequency. Also known as a low-cut filter. HPF rolls off signals below 30Hz or 50Hz. The HPF removes frequencies below 30Hz or 50Hz. The reproduction of the signal's bass portion is thus optimized, since ultra-low, distracting frequencies are eliminated, and more power is available for the reproduction of the wanted segment of the signal.

You should set up the filters so they best suit the frequency response of your speakers, since some speakers are particularly sensitive to over-excursion. The 50Hz filter works well with most compact full-range speakers.

Mode Select



Stereo Mode

In stereo mode, both channels operate independently, with their input gain controls. Signal at channel 1's input produces output at channel 1, while signal at channel 2's input produces output at channel 2's output. Recommended minimum nominal load impedance for stereo operation is 2 ohms per channel.

Parallel Mode

When set to Parallel mode, a signal applied to channel 1's input will be amplified and appear at outputs for both channel 1 & 2. With set to parallel. The parallel mode is well-suited for applications in which driving two speakers with the same signal but with separate amplification.

Bridged Mono Mode

Bridged mono mode straps both amplifier channels together to make a very powerful, single-channel monaural amplifier. One channel “pushes” and the other channel “pulls” equally, doubling the power over that of either channel alone. Therefore the voltage is doubled, the peak power is quadrupled, and program power is roughly three times as high as that of the individual channel.

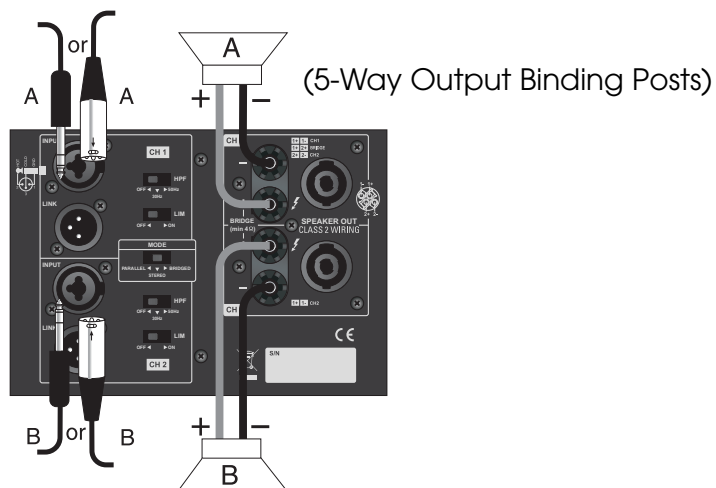
Signal is applied to the channel 1 input only and channel 1 input gain control is used to adjust signal level. The input gain control belonging to channel 2 are not used.

Note : *Bridged mono mode is to be used only when the A Series is connected to a 4 or 8 ohms speaker load. Use of Bridged mode with speaker loads of 4 ohms or less can result in severe damage to the unit due to excessive heat and current limiting.*

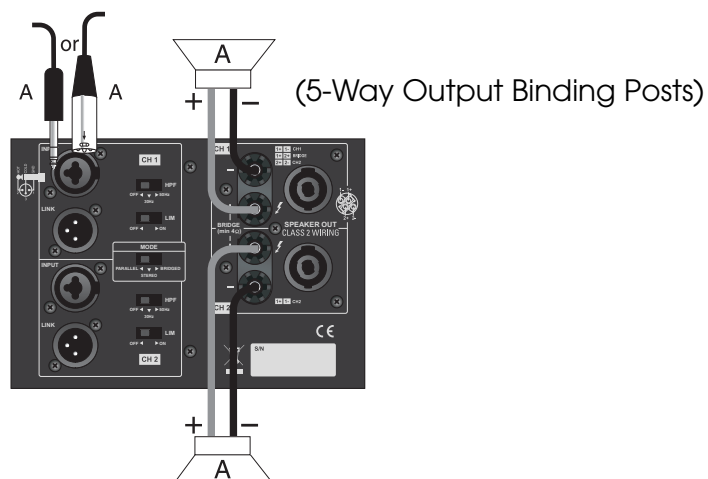
Use extreme caution when operating the amplifier in Bridged Mono Mode. Never ground either side of the speaker cable when the amplifier is in Bridged Mono Mode ; the speaker load must “ float “ away from the amplifier chassis.

Connections

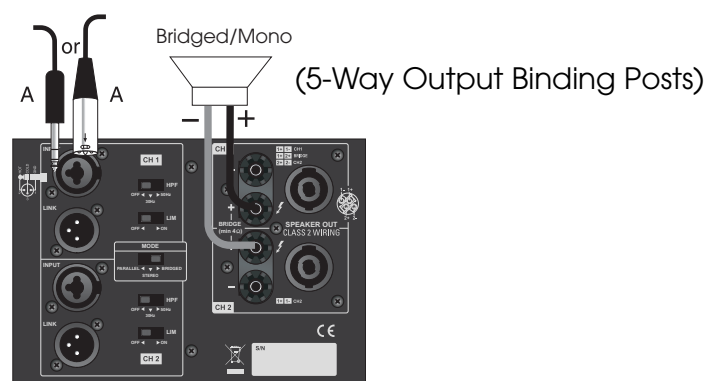
Stereo Mode



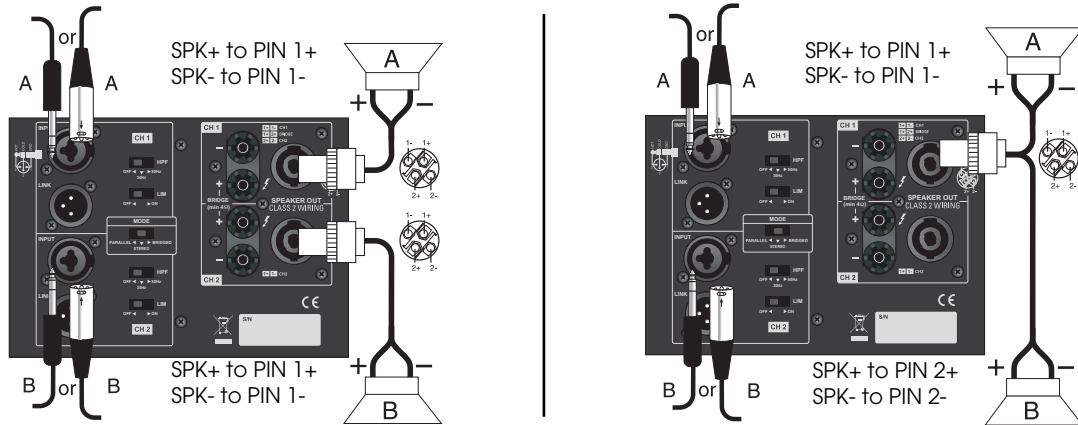
Parallel Mode



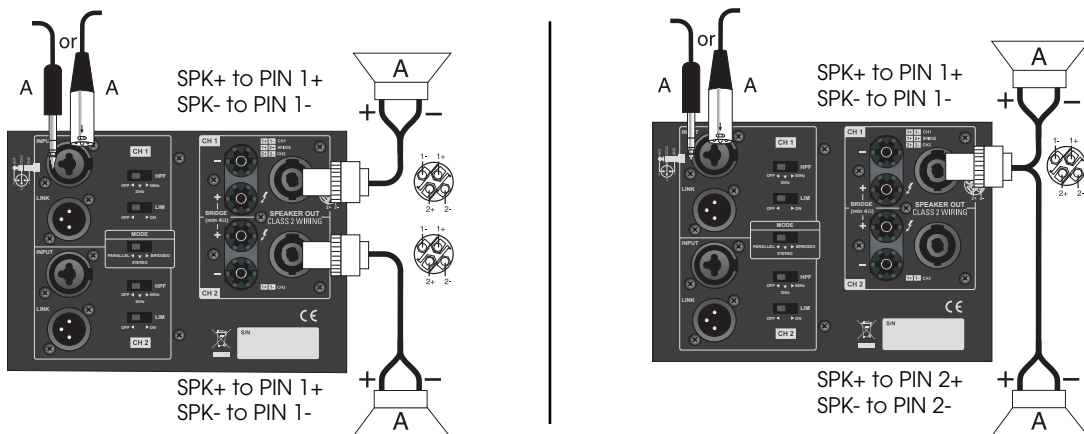
Bridged Mono Mode



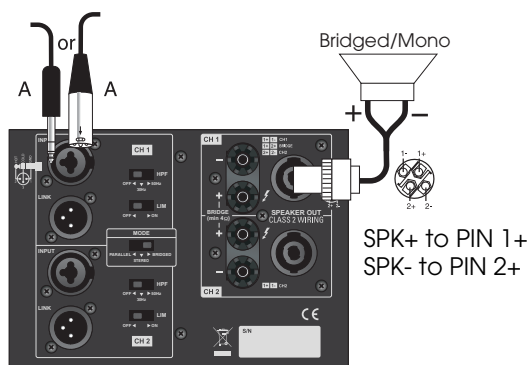
Stereo Mode



Parallel Mode



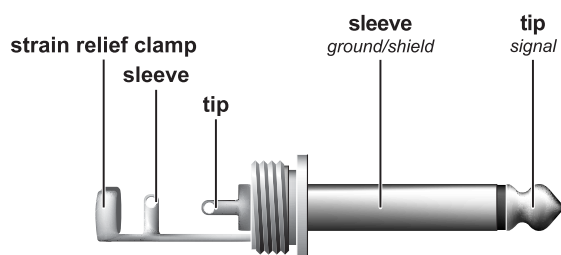
Bridged Mono Mode



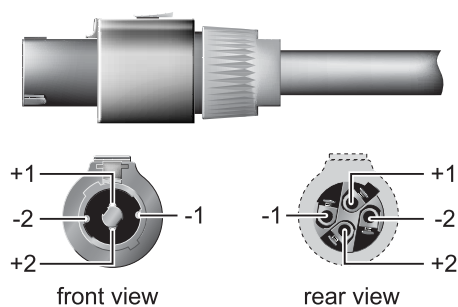
Wiring

These are several ways to interface the A series amplifier to support a variety of applications. The A series features balanced inputs and outputs, so connecting balanced and unbalanced signals is possible.

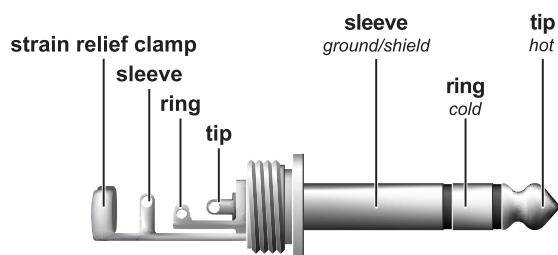
Unbalanced 1/4" Connector



Speakon® Output Connector

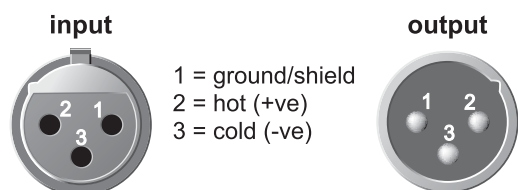


Balanced TRS 1/4" Connector



For connection of balanced and unbalanced plugs, ring and sleeve have to be bridged at the stereo plug.

XLR Balanced Wiring Guide



For unbalanced use pin 1 and pin 3 have to be bridged

Specifications

0dB=0.775V 0dBV=1V

	A 4000	A 5000
Rated Output Power	Stereo Both Channel Driven	
8 ohms	850W	1100W
4 ohms	1400W	1800W
2 ohms	2000W	2500W
Rated Output Power	Bridged Mono	
8 ohms	2800W	3600W
4 ohms	4000W	5000W
Signal to Noise Ratio (20 Hz ~ 20k Hz)	<-100dB	<-100dB
Distortion (SMPTE-IM)	< 0.02%	< 0.02%
Input sensitivity @8 ohms	1.25V (+4dB)	1.42V (+5.3dB)
Voltage Gain	36dB	36dB
Output Circuitry	Class-H, 3 tier	Class-H, 3 tier
Current Consumption	120Vac / 240Vac	
@ 1/8 power @4 ohms	10A	13.9A
@ 1/3 power @4 ohms	21.1A	26.9A
@ Rated power @4 ohms	42.2A	56.4A
Distortion		
20 Hz-20k Hz Half Power	< 0.03% / 4Ω and 8Ω	< 0.03% / 4Ω and 8Ω
1k Hz Rated Power	< 0.03% / 4Ω and 8Ω	< 0.03% / 4Ω and 8Ω
Frequency Response	5Hz to 50kHz to -3dB	
Damping Factor (400 Hz)	>300 at 8Ω	>300 at 8Ω
Input Impedance	10Kohm Unbalanced, 20Kohm Balanced	
Input Clipping	+14dB	
Cooling	Continuously variable speed, Fan front to rear airflow	
Connectors (each)		
Input	Active balanced combo (XLR and 1/4" TRS common use) XLR male Link	
Output	5-way Binding post and Speakon	
Control		
Front	AC power switch, Channel 1 and 2 volume	
Rear	HPF switch, Limiter switch, Mode selector switch	
Indicators	Active(blue), Protection(red), Clip(red), Signal (green & yellow)	
Protection	Short circuit, Thermal, Current limit, DC offset, Current inrush, RF protection, Turn on / Turn off muting	
Power requirements	100, 120/240Vac, 50/60Hz	
Dimensions (W × H × D)	19"(482mm) x 5.25"(132mm) x 19"(482mm)	
Net Weight	79.3lb (36kg)	83.3lb (37.2kg)

Necessary modifications are carried out without notice.

