



User's Manual

EP SERIES

EP-450 / EP-2K4 / EP-6K4 / EP-10K4 / EP-22K4



Before operating the device, please read the "Safety precautions" section of this manual. Retain this manual for future reference.

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Keep these instructions. Read these instructions.
Heed all warnings. Follow all instructions.

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



The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage". To reduce the risk of electric shock do not remove the cover. No user serviceable parts inside.



WARNING: Apparatus with CLASS I construction shall be connected to a MAINS socket outlet with a protective earthing connection.

Do not expose this device to rain or moisture. Do not use this apparatus near water (for example, swimming pools and fountains). Do not place any objects containing liquids, such as bottles or glasses, on the top of the unit. Do not splash liquids on the unit. IP-20 equipment. Clean only with a dry cloth. Do not use any solvent based cleaners.



WARNING: To prevent injury, this apparatus must be securely attached to the rack in accordance with the installation instructions.

The connected outer wiring to these terminals requires of its installation by an instructed person and the use of a flexible cable already prepared.

Do not install near any heat sources such as radiators, stoves or other apparatus that produce heat. Do not block any ventilation openings, install in accordance with the manufacturer's instructions.

The cooling fans push cool air through one side and blow hot air out of the other side of the unit through the ventilating grilles.

Do not block the sides of the amplifier (i.e. in a rack with grilles). Allow an air flow gap of 5cm or more on the sides. IF THE AIR IS NOT ALLOWED TO CIRCULATE, OVERHEATING WILL OCCUR.

Take care when mounting other equipment in the same rack.

Working temperature ranges from 15°C to 45°C with a maximum relative humidity of 75%.

Unplug this apparatus during lightning storms, earthquakes or when unused for long periods of time.

Take into account that the nominal AC voltage is the value shown in the equipment $\pm 10\%$ (according to IEC 60065:2001).

Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from the apparatus.

Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as if the power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

The mains circuit breaker shall remain readily accessible.

To completely disconnect this equipment from the AC mains, disconnect the power cord from the mains circuit breaker.

This unit is fitted with a 3-wire power cord. For safety reasons, THE EARTH LEAD SHOULD NOT BE DISCONNECTED UNDER ANY CIRCUMSTANCES.

Where the amplifier is mounted in a rack and permanently connected to the mains, then the rack should be installed with a readily accessible connector or an ALL POLE circuit breaker with 3mm breaking distances.

The mains switch on the amplifiers only switches one pole of the mains supply, therefore for units with a detachable cord to be fully disconnected from the mains, the mains disconnect device (ie mains plug or mains coupler) should remain readily operable. For units with a fixed mains lead the external all pole circuit breaker with 3mm breaking distances is the disconnect device and therefore the installation of the amplifier shall be carried out in accordance with all the applicable installation rules.



Only use attachments/accessories specified by the manufacturer. Use only with the cart, 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 a tip over.



This symbol on the product indicates that this product should not be treated as household waste. Instead it shall be handed over to the applicable collection point for the recycling of electrical and electronic equipment.

WARRANTY

All our products are warrantied against any manufacturing defect for a period of 36 months from date of purchase.

The warranty excludes damage from incorrect use of the product.

All warranty repairs must be exclusively undertaken by the factory or any of its authorised service centers.

To claim a warranty repair, do not open or intend to repair the product.

All the details related to the warranty (such as extended warranties) can be found in the SUPPORT section on our website: www.dasaudio.com



DECLARATION OF CONFORMITY

DAS Audio Group, S.L.

C/ Islas Baleares, 24 - 46988 - Pol. Fuente del Jarro - Valencia. España
(Spain).

Declares that *EP series*:

Abide by essential objectives relating Directives:

- Low Voltage Directive 2014/35/UE
- Electromagnetic compatibility Directive EMC 2014/30/UE
- RoHS Directive 2011/65/UE
- RAEE Directive (WEEE) 2012/19/UE

In accordance with Harmonized European Norms:

- EN 62368-1:2014.- Audio/video, information and communication technology equipment - Part 1: Safety requirements.
- EN 55032:2012.- Electromagnetic compatibility of multimedia equipment. Emission requirements.
- EN 55103-2:2009.- Electromagnetic compatibility. Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 2:Immunity.
- EN 50581:2012.- Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

INSTALLATION

Unpacking

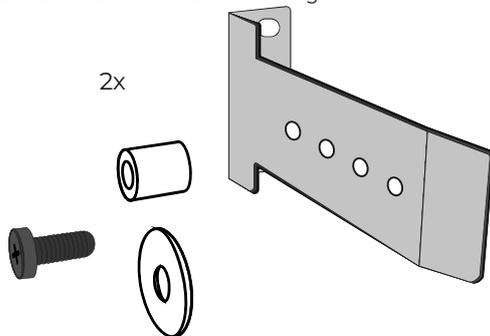
Carefully open the shipping carton box and check for any noticeable damage. Every amplifier has been QC tested and inspected before leaving the factory. If any damage may have happened during transportation notify the incidence to the shipping company immediately. Keep the carton box in case you need to ship the amplifier to an authorized service center.

Rack Mounting

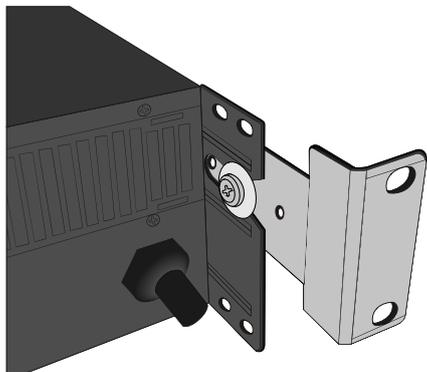
Free airflow, front to rear, of the amplifier unit must be allowed. Therefore, no doors or rack lids should be mounted in front of or behind the amplifiers in order to not block the airflow necessary to cool the units.

Amplifiers may be installed stacked directly one on top of each other, but the ideal configuration would be spacing them vertically 1 rack unit.

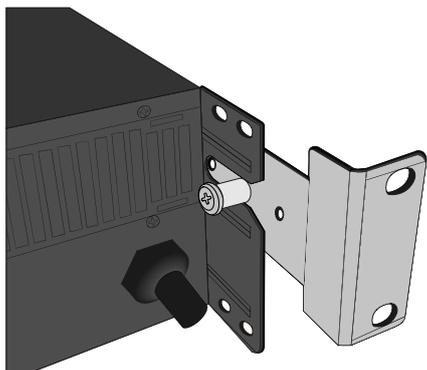
It is recommended to assemble the rear brackets provided with the units when fixing them to a rack:



Rear mounting brackets and hardware provided



Insert the Screw + Washer and fix the bracket to the rear panel for permanent installation



Use the Spacer for non permanent installation

Cooling

The amplifier uses a forced air cooling system with front to rear airflow in order to maintain a controlled operation temperature.

The cooling fans suck cool air in through the front and blow hot air out at the rear of the unit through the ventilating grills. The front and rear of the amplifier should have free exposure to the air (i.e. in a rack leave the front & rear doors off), with 2cm air gap at the sides.

It is also very important to keep clean the dust filters located behind the detachable front panel in order to ensure always maximum air flow.

The filter behind the air intake apertures on the front of your amplifier should be cleaned or replaced periodically, e.g. 12-24 months. (Filters in amplifiers located in more 'dirty' atmospheres may require more frequent maintenance).

The filter should be 'dry' cleaned, using a vacuum cleaner preferably. Running the unit without a filter is not

Operating Voltage

The label placed close to the mains cable at the rear amplifier panel indicates the nominal operating voltage of the unit. Be sure of the nominal voltage required by the amplifier before connecting it to the mains.

In case the power connector supplied with the power cord is not valid for your area / region it would need to be removed and replaced by a convenient one wired as follows:

BLACK or BROWN	LIVE
WHITE or BLUE	NEUTRAL
GREEN or GREEN/YELLOW	EARTH (GROUND)

Once a suitable AC supply is connected to the unit, the amplifier can be turned on using the front panel power switch. The amplifier will start a short auto-check sequence:

- Power led will lit in green.
- The fans will blow at the highest speed before dropping to idelstate.
- Mute leds will indicate that all output channels are muted during the test. After 3 seconds channels will be unmuted.

The inrush current is controlled during the auto-check sequence enabling multiple amplifiers to be turned on at the same time.

Power cables

115V areas

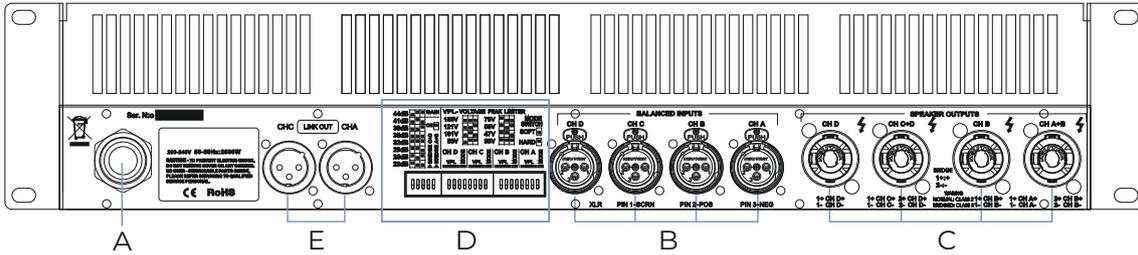
Use standard 15A Edison plug for models EP-2K4 and EP-6K4. One 20A circuit per amplifier.

Use Nema L5-30 Twist lock plug for models EP-10K4 and EP-22K4. One 30A circuit per amplifier.

230V areas

Use in all cases standard 16A Schuko plug.

REAR PANEL



A) Mains input

B) Analogue balanced audio inputs

Four XLR input connectors located at the rear panel allow injecting signal to the different channels of the amplifier.

C) Amplifier outputs

Four Neutrik NL4 output connectors located at the rear panel permit the connection of the amplifier channels to the speaker systems. The amplifier outputs are named CH A, CH B, CH C and CH D.

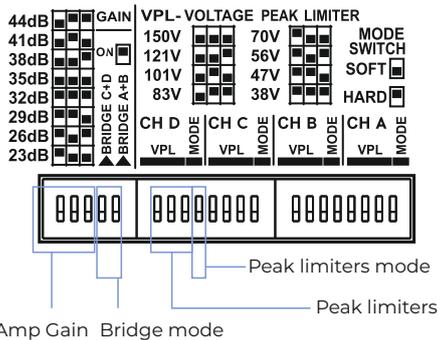
NL4 connector for outputs B and D include 2 active connecting pins, +/-.

NL4 connectors for outputs A and C include 4 active connecting pins, +/- and +/2. By doing this the user may have all the four output channels connected to 2 cables.

When using channels in bridge mode the speaker systems must be connected to CH A or CH C using the pins +1/-2.

D) DIP Switches

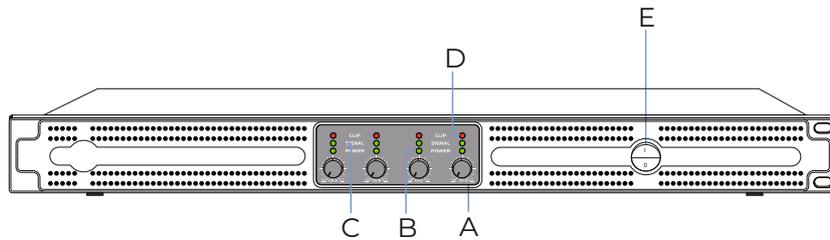
different parameters of the amplifier can be configured at the rear panel with the mini DIP switches:



E) Analogue balanced audio outputs.

Two XLR output connectors located at the rear panel allowing having a copy of inputs A & C.

FRONT PANEL



A) Level control

Four level potentiometers are located at the front panel providing individual channel attenuation. Level range varies from -50dB to 0dB. The 12 o'clock position equals to -25dB attenuation

B) Power ON Indicator

This LED lights when the mains switch is pressed. If it does not light up, the unit is not connected to the mains or the mains fuse has blown.

C) Signal indicator

This LED lights up if signal is detected at the amplifier's output channel. The indicator goes off when no signal or when a protective circuit has been activated in the amplifier.

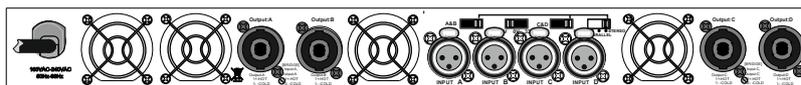
D) Limit

This LED lights up if the limiter threshold has been reached and the amplifier is being operated at the clip level. When the LED flashes permanently the volume of the input audio source should be reduced or the gain control of the amplifier's channel turned counter clockwise.

E) Power Switch

The unit is switched on by the use of the power switch. Loudspeaker outputs are switched on via delayed relays in order to avoid audible transients.

REAR PANEL



Input mode choice

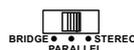
Stereo mode(factory mode)

When set as the figure, channels A and B are in stereo mode, set each channel volume directly. Operation of Channels C and D will be the same;



Parallel mode

When set as the figure, channels A and B are in parallel mode, input signal into channel A then both, A and B channels use the same signal Set each channel volume directly. Operation of Channels C and Channel D will be the same.



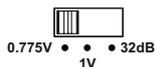
Bridge mode

When set as the figure, channels A and B are in bridge mode, input signal into channel A, channels A and B will operate as a mono output, volume control of Channel A will manage both channels. Operation of Channels C and Channel D will be the same.



Input sensitivity choice;

The input sensitivity choice of this device is 0.775V(factory setting),1V,32dB



AMPLIFIER CONFIGURATION

All EP series models include at the rear panel a group of mini dials to configure different settings of the units.

These are the parameters accessible via rear panel of the units:

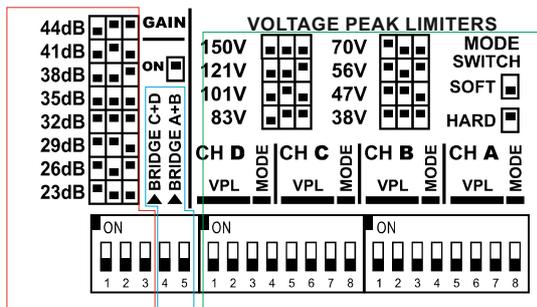
- Amplifier GAIN (dB). By default is set to 35dB.

- Bridge or Stereo mode. By default is set to stereo mode.

- Maximum voltage available per output channel. This is basically a limiter that allows the end user to reduce the voltage produced by the amplifier to match the power capacity of the audio systems. By default the amplifier is set to its maximum capability.

- Hard or Soft limiting mode. When hard mode is enabled the attack time of the limiter is shorter and allows less peaks to be driven to the load.

Rear mini DIPs detail



Gain

Globally affects all channels. From + 23 dB to + 44 dB in 3dB steps.

Bridge

Switches the channel pairs into bridge mode. Valid for channels A+B and C+D.

Voltage Limiters

Adjust (per channel) the maximum value of the desired peak voltage accordingly to the audio system's power handling.

Maximum voltage (per channel) Stereo mode

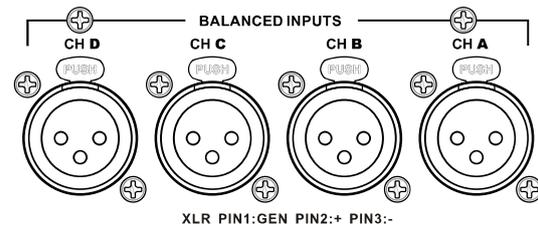
EP-2K4	EP-6K4	EP-10K4	EP-22K4
101 V	101 V	150 V	195 V
83 V	83 V	121 V	170 V
70 V	70 V	101 V	140 V
56 V	56 V	83 V	116 V
47 V	47 V	70 V	100 V
38 V	38 V	56 V	80 V
n/a	n/a	47 V	66 V
n/a	n/a	38 V	54 V

Maximum voltage (per channel) Bridge mode

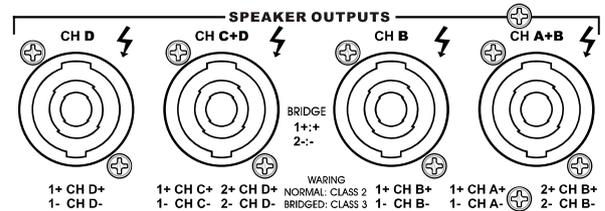
EP-2K4	EP-6K4	EP-10K4	EP-22K4
202 V	202 V	300 V	195 V
166 V	166 V	242 V	170 V
140 V	140 V	202 V	140 V
112 V	112 V	166 V	116 V
94 V	94 V	140 V	100 V
76 V	76 V	112 V	80 V
n/a	n/a	94 V	66 V
n/a	n/a	76 V	54 V

Input and Output connectors

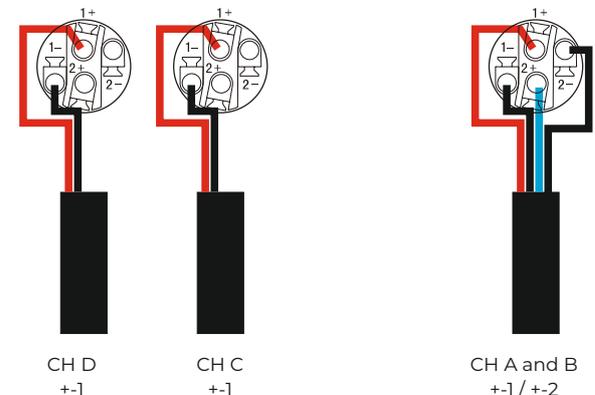
All EP series models are equipped with 4x XLR input connectors (one per amplifier channel). All models include 2x XLR output (loop thru of input channels A and C) connectors are also available for daisy chaining multiple amplifier channels using the same audio signal.



All EP series models are equipped with 4x NL4FC Speakon Output connectors (Speaker Outputs), one per amplifier channel.



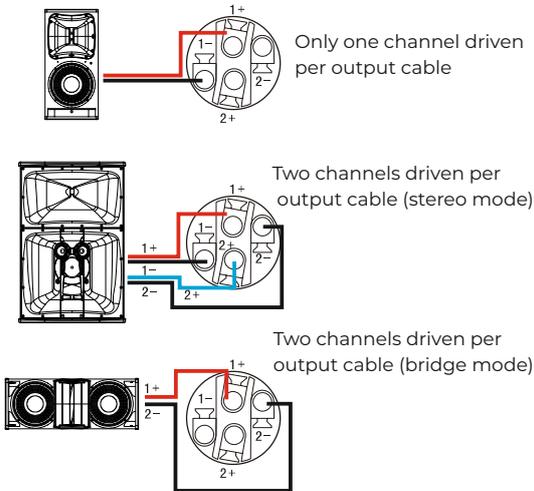
Two amplified channels can be connected from a single NL4FC connector (see figure below, CH A and B):



When using a bridge configuration use pins +1 and -2 of the NL4 connector in your cable.

Cables and Output Connectors

Use one of these three options when connecting your cable to the amplifier output channel connector:



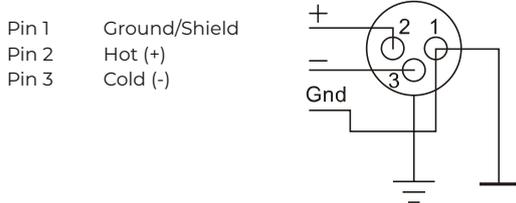
The outputs on all EP series models produce high voltage. Do not connect or disconnect the loudspeaker cables while the amplifier is working. Never operate an amplifier with any portion of bare loudspeaker cable exposed.

WARNING:

Minimum nominal impedance per channel 4ohm

Balanced Input Connections

All EP series models are equipped with 4x XLR balanced input connectors, one per amplifier channel. The XLR input connectors are electronically balanced and wired according to the IEC268 standard (pin 2 = +). XLR cable connectors should be wired as follows:



Unbalanced Input Connections

These type of connection is not recommended for professional audio applications as it may cause noise in the installation.

Cables and Output Connectors

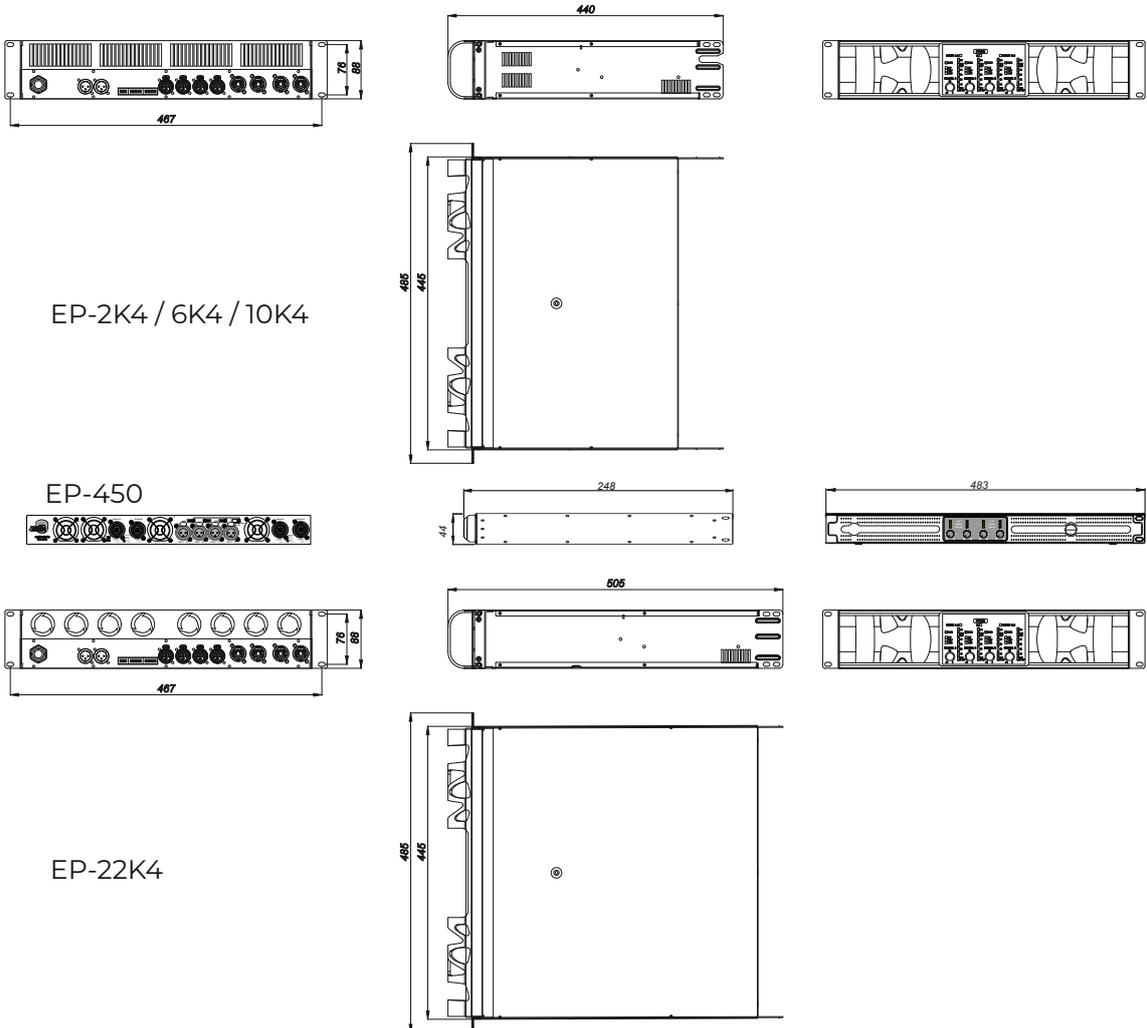
Use one of these three options when connecting your cable to the amplifier channels:

SPECIFICATIONS

	EP-450	EP-2K4	EP-6K4	EP-10K4	EP-22K4
Output Power Ratings					
Power 8 Ohms, all Channels Driven	4 x 400W	4 x 300W	4 x 625W	4 x 1350W	4 x 2500W
Power 8 Ohms, two Channels Bridged	-	2 x 1200W	2 x 2500W	2 x 4200W	2 x 9500W
Power 4 Ohms, all Channels Driven	4 x 600W	4 x 600W	4 x 1250W	4 x 2100W	4 x 4650W
Electronics and Connectors					
Amplifier Channels	4	4	4	4	4
Output Circuitry			Switched Amplification		
Frequency Response			10 Hz - 30 kHz (0/-0.5dB)		
Voltage Gain	0.775V / 1V / 32 dB		23 - 44 dB (Rear DIPs adjustable)		
Controls	Power On/Off, Gain Pots		Power On/Off, Gain Pots, Rear DIP Switches		
Cooling			Front to Back		
Amplifier Protections			Thermal, Overload, Short Circuit, Over Current		
LED Indicators			Independent Channel Meters, CLIP/VPL, Mute, VHF, Temp, On		
Audio Signal Input Connectors			4 x Balanced Neutrik XLR		
Speaker Output Connectors			4 x Neutrik NL4		
AC Power Requirements, 115A	15A	15A	15A	15A	30A
Dimensions - Weight					
Dimensions (H x W x D)	50 x 489 x 248 mm 2 x 19.25 x 9.75 in	88 x 485 x 440 mm 3.5 x 19 x 17.3 in	88 x 485 x 440 mm 3.5 x 19 x 17.3 in	88 x 485 x 440 mm 3.5 x 19 x 17.3 in	88 x 485 x 505 mm 3.5 x 19 x 19.9 in
Net Weight	4,5 kg (10 lb)	14 kg (30.8 lb)	14,5 kg (31.9 lb)	15,5 kg (34.1 lb)	19,5 kg (42.9 lb)
Shipping					
Carton Dimensions (H x W x D)	101 x 546 x 317,5 mm 4 x 21.5 x 12.5 in	190 x 571 x 508 mm 7.5 x 22.5 x 20 in	190 x 571 x 508 mm 7.5 x 22.5 x 20 in	190 x 571 x 508 mm 7.5 x 22.5 x 20 in	177,8 x 660 x 622,3 mm 7 x 26 x 24.5 in
Shipping Weight	6 kg (13.2 lb)	14 kg (31 lb)	14 kg (31 lb)	15,8 kg (35 lb)	20,86 kg (46 lb)

All specifications are subject to change without prior notice.

LINE DRAWINGS



TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
Nosound from the unit	<ol style="list-style-type: none"> 1 - The signal source is sending no signal. 2 - Input gain controls are at minimum position. 3 - Defective signal cables. 4 - Amplifier not plugged. 5 - Thermal protection activated. 	<ol style="list-style-type: none"> 1 - Check that the source is not muted and is sending signal to the unit. 2 - Check input gain controls. Put them at maximum level. 3 - Check that the cable from the source to the unit is connected correctly. Replace the cable if defective. 4 - Check the connections. 5 - Lower the input signal level and double check that the amplifier fans are working properly.
Full power cannot be obtained.	<ol style="list-style-type: none"> 1 - The signal source does not have enough output level and / or the amplifier GAIN is set to a low value. 2 - Input gain controls are at very low volume. 	<ol style="list-style-type: none"> 1 - Use balanced outputs of a mixer. Rise master output volume of the source. Use a professional sound mixer providing enough output voltage. Set the amplifier gain to a higher value. 2 - Set up level controls at higher positions.
Sound is distorted.	<ol style="list-style-type: none"> 1 - The mixer or signal source is distorting. 2 - The output level from the mixer is too high. 3 - Amplifier clip shown in the channel. 	<ol style="list-style-type: none"> 1 - Turn down the mixer's output and check no channels are distorting. 2 - Turn down the mixer's output. 3 - Turn down input gain controls or lower input signal level.
Hum or buzz when a mixer is connected to the unit.	<ol style="list-style-type: none"> 1 - The console probably has unbalanced outputs. You may be using an incorrect unbalanced to balanced cable. 2 - The mixer and the powered speaker are not plugged into the same mains outlet. 3 - The audio signal cable is too long or too close to an AC cable. 	<ol style="list-style-type: none"> 1 - Read the appendix of this manual to make a correct unbalanced to balanced cable. 2 - Connect the mixer and the unit to the same mains outlet. 3 - Use a cable that is as short as possible and/or move the audio signal cable away from mains cables.
Hum or buzz when using lighting controls in the same building.	<ol style="list-style-type: none"> 1 - The audio signal cable is too long or too close to the lighting cable. 2 - On a sound system with three phase AC, the lighting equipment and the unit are connected to the same phase. 	<ol style="list-style-type: none"> 1 - Move the audio signal cable away from lighting cables. Try to find out at what point the noise is leaking into the system. 2 - Connect the sound system to a different phase than the lights. You may need the help of an electrician.
Low sound.	<ol style="list-style-type: none"> 1 - The audio signal cable is defective. 2 - The Level controls are not at maximum position. 3 - Low input signal level. 4 - Using speakers with transformer in stereo mode. 	<ol style="list-style-type: none"> 1 - Check cabling and replace them. 2 - Turn up level controls of the output channels. 3 - Turn up the level from the source. 4 - Change the amplifier's mode from Stereo to Bridge (100/70V).
The MUTE led and the Temp Led are indicating protection.	<ol style="list-style-type: none"> 1 - The unit has activated the thermal protection. 	<ol style="list-style-type: none"> 1 - Lower the input level and make sure the amplifier is being cooled correctly. Check that the fan is working and be sure that all the air inlets/outlets are not blocked.

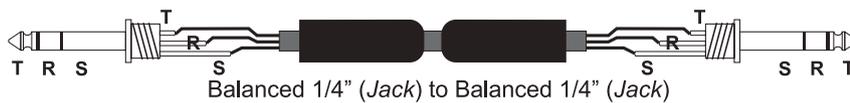
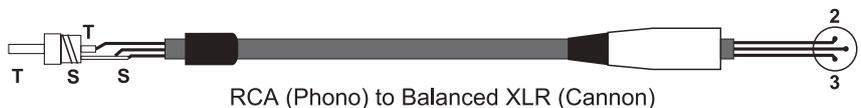
ANNEX : Line connections: unbalanced and balanced

There are two basic ways to transport an audio signal with microphone or line level:

Unbalanced line: Utilising a two conductor cable, it transports the signal as the voltage between them. Electromagnetic interference can get added to the signal as undesired noise. Connectors that carry unbalanced signals have two pins, such as RCA (Phono) and ¼" (6.35mm, often referred to as jack) mono. 3 pin connector such as XLR (Cannon) may also carry unbalanced signals if one of the pins is unused.

Balanced line: Utilising a three conductor cable, one of them acts as a shield against electromagnetic noise and is the ground conductor. The other two have the same voltage with respect to the ground conductor but with opposite signs. The noise that cannot be rejected by the shield affects both signal conductors in the same way. At the device's input the two signals get summed with opposite sign, so that noise is cancelled out while the programme signal doubles in level. Most professional audio devices use balanced inputs and outputs. Connectors that can carry balanced signal have three pins, such as XLR (Cannon) and ¼" (6.35mm) stereo.

The graphs that follow show the recommended connection with different types of connectors to balanced processor or amplifier inputs. The connectors on the left-hand side come from a signal source, and the ones on the right hand side go to the inputs of the processor or amplifier. Note that on the unbalanced connectors on the left-hand side, two terminals are joined inside the connector. If hum occurs with balanced to balanced connections, try disconnecting the sleeve (ground) on the input connector. Note that the illustrations show what should be connected to what, but that pin locations on an actual XLR connector are different. Also, pin 2 hot is assumed on XLR connectors.





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