



KA24 - KA84

USER GUIDE
English

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SYMBOLS



K-array declares that this device is in compliance with applicable CE standards and regulations. Before putting the device into operation, please observe the respective country-specific regulations!



WEEE

Please dispose of this product at the end of its operational lifetime by bringing it to your local collection point or recycling center for such equipment.



This symbol alerts the user to the presence of recommendations about the product's use and maintenance.



Warning! Dangerous voltages: RISK of electric shock.

Terminals marked with this symbol are HAZARDOUS LIVE and the external wiring connected to these terminals requires installation by a qualified professional or the use of ready-made leads or cords.



This symbol alerts the user to the presence of recommendations about product's use and maintenance.



This device complies with Restriction of Hazardous Substances Directive.

1. INTRODUCTION

The K-array KA line of power amplifiers are comprised of KA24 and KA84. The KA24 has 4 channels per 500W on 4Ω and the KA84 has 4 channels per 2000W on 4Ω. Each model has 4 fully independent and configurable channels. The integrated DSP offers EQ, Matrix, Levels, Delays and Limiter functions on every channel, to avoid the need of external additional processors. The front panel has an easy-to-use touchscreen that gives access to all the basic functions for quick setup and corrections. The KA24 and KA84 can be used as a mixer for fixed installations thanks to the microphone and Phantom power options available on every analog IN. 2 GPIO ports give easy external analog controls using K-array accessories.

An on-board K-array speaker preset library gives an optimal and easy configuration for endless combinations. All DSP functions are remote controlled via the K-framework software over RS485 (3-pin XLR) or integrated USB connector.

Both amplifiers are built into a 2U light weight aluminium chassis and come with a kit of removable rack adapters and four rubber pads for flat surfaces.

KA amplifiers feature optical limiters, and protection against over heating, over current and short circuits.

All KA components are designed by the K-array R&D department and custom made under the K-array quality control system.

2. KEY FEATURES

- 2000 W or 8000 W in just 2 rack units
- 4 analog IN and 2 AES-EBU IN to 4 fully configurable OUT
- 2 GPIO for external analog controls
- Mix sensitivity and phantom power is available in all 4 analogue inputs.
- Integrated DSP with processing, matrix and delays
- On-board touch screen for easy access functions
- K-array loudspeakers presets already on-board
- RS485 and USB connectivity for remote control

3. APPLICATIONS

- Theatrical sound reinforcement
- Concert halls, clubs, house of worship
- Exhibit audio for museum displays
- Cinema and installed AV systems
- Touring PA and Monitoring

4. SAFETY INFORMATION

Read these instructions - Keep these instructions - Heed all warnings



Warning. Failure to follow these safety instructions could result in fire, shock or other injury or damage to the device or other property.



This symbol alerts the user to the presence of recommendations about the product's use and maintenance.



The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated, dangerous voltage within the product enclosure that may be of magnitude to constitute a risk of electrical shock.

IMPORTANT SAFETY INSTRUCTIONS

- Read these instructions.
- Keep this instructions.
- Heed all warnings.
- Follow all instructions.
- Do not use this apparatus near water.
- Clean only with dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 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.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer.
- 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.

- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service 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, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

**WARNING**

- Since the device is a CLASS I apparatus, it must be only connected to an AC three-wire grounding outlet. If your outlet isn't grounded, contact a licensed electrician to replace it with a property grounded outlet.
- To reduce the risk of electric shock, disconnect the amplifier from the AC mains before installing audio cable. Reconnect the power cord only after making all signal connections. Do not use the product if the power cord is broken or frayed. Protect the power cord from being walked upon or pinched.
- To completely disconnect this apparatus from the ac mains, disconnect the power supply cord plug from the ac receptacle.
- **Voltage requirement.** Make sure that the supplied voltage stays within the specified range. Verify that your mains connection satisfies the power ratings of the device.
- Only connect the power supply to an appropriate power outlet.
- Do not install the amplifier in wet or humid locations without using weather protection.
- TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, do not expose this apparatus to rain or moisture and objects filled with liquids, such as vases, should not be placed on this apparatus.
- The main plug of the power supply cord shall remain readily accessible.

**CAUTION**

- **Choking Hazards.** This device contains small parts, which may present a choking hazard to small children. Keep the device and its accessories away from small children.
- It is important that loudspeaker systems are used in a safe manner.
- **Do not make repairs yourself.** Caution, risk of electric shock. Do not open the device, it contains potentially hazardous voltage. Never attempt to disassemble, repair or modify the system yourself. Disassembling the unit may cause damage that is not covered under the warranty. The device contains no user-serviceable parts. Repairs should only be performed by factory trained service personnel. Do not plug the power cord in if you suspect that your device needs service or repair.

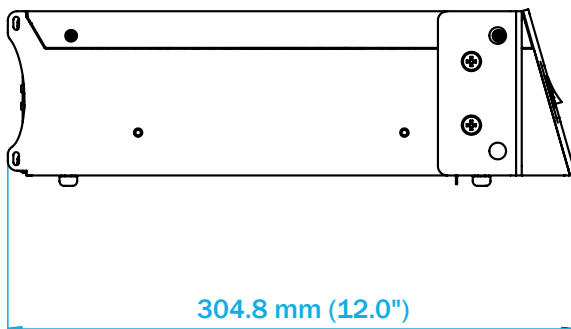
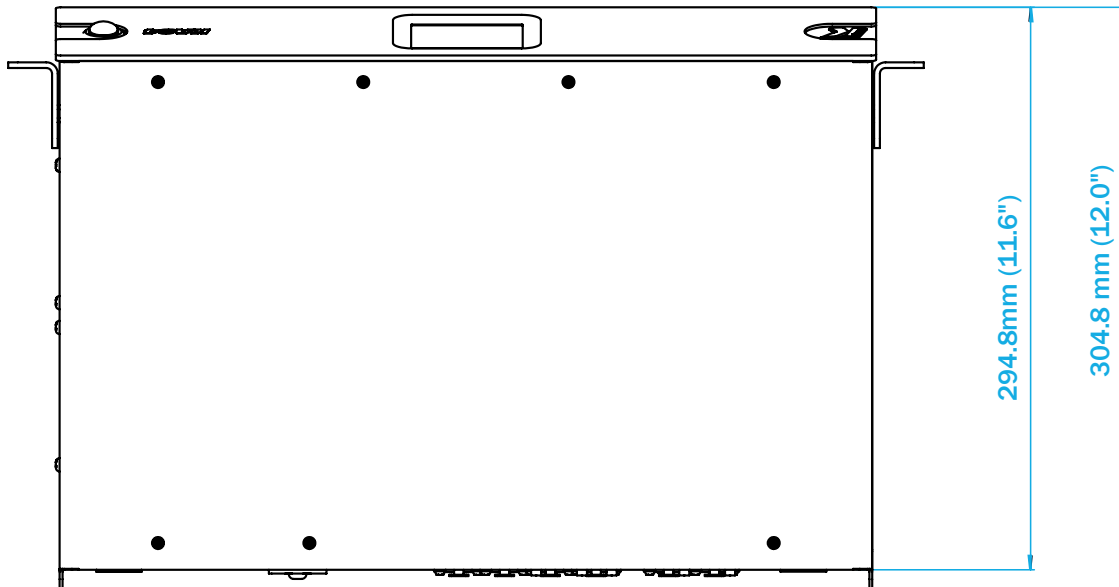
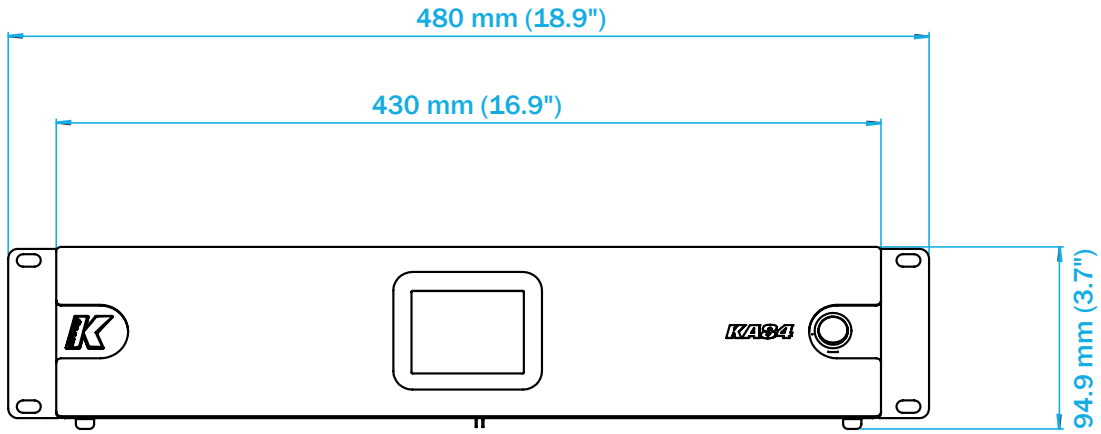
5. UNPACKING

Each K-array amplifier is built to the highest standard and thoroughly inspected before leaving the factory. Upon arrival, carefully inspect the shipping carton, then examine and test your new amplifier. If you find any damage, immediately notify the shipping company. Only the consignee may institute a claim procedure regarding the system's electronic equipment.

6. INCLUDED ACCESSORIES

- Power cable 3 m
- USB cable 1.8 m
- Rubber pads for flat surfaces installation
- Rack brackets

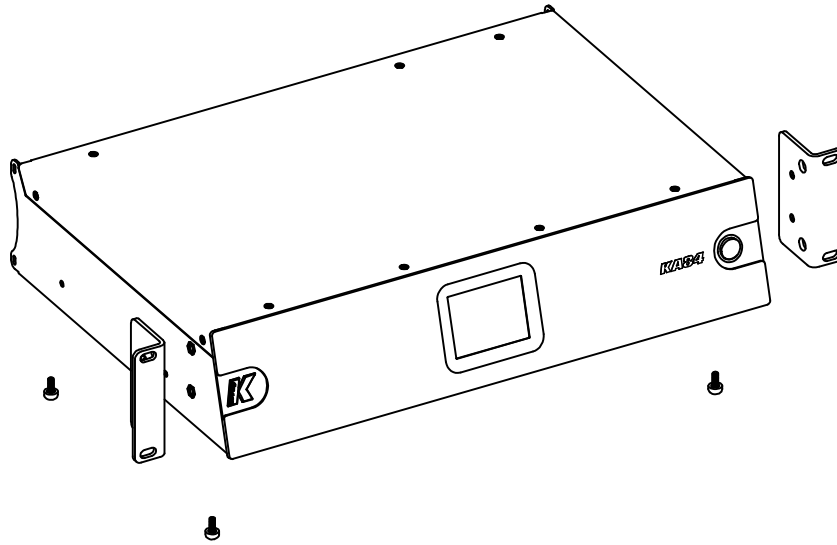
7. PHYSICAL



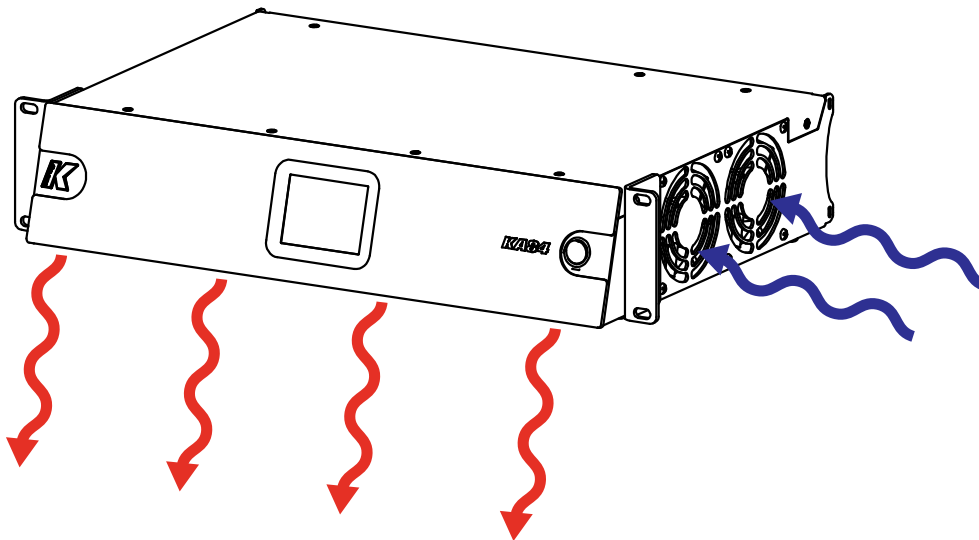
Weight
KA24: 5.5 Kg (12.12 lb)
KA84: 6.1 Kg (13.45 lb)

8. INSTALLATION

KA24 and KA84 are two rack units high (2U) and can be mounted in an EIA-standard 19" rack using two rack adapters (included). In case of installation on a flat surface, use the four rubber pads included.



To maintain a low and even operating temperature, the amplifier contains two fans on the right side. The figure below shows the air flow:



WARNING
For effective cooling, do not obstruct the ventilation openings.



9. AC POWER

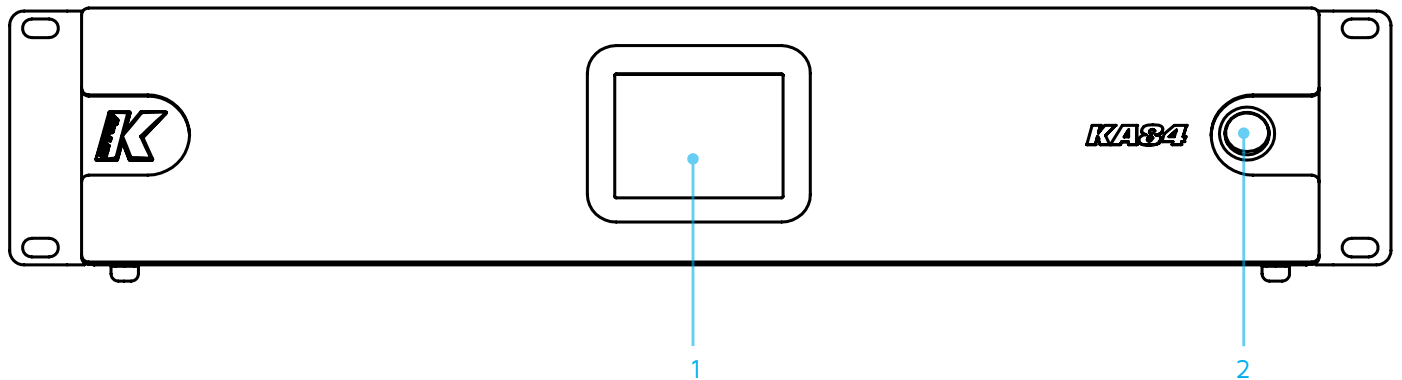
KA24 and KA84 operate safely and without audio discontinuity if the AC voltage stays within an operating range of 90 V to 264 V (nominal range: 100-240 V) at 50 or 60 Hz. Please verify that your AC main connections are capable of satisfying the power rating for the device.



CAUTION. Do not connect the system to AC power mains exceeding 265 V. Doing so will cause significant damage to the device and create serious risk for users!

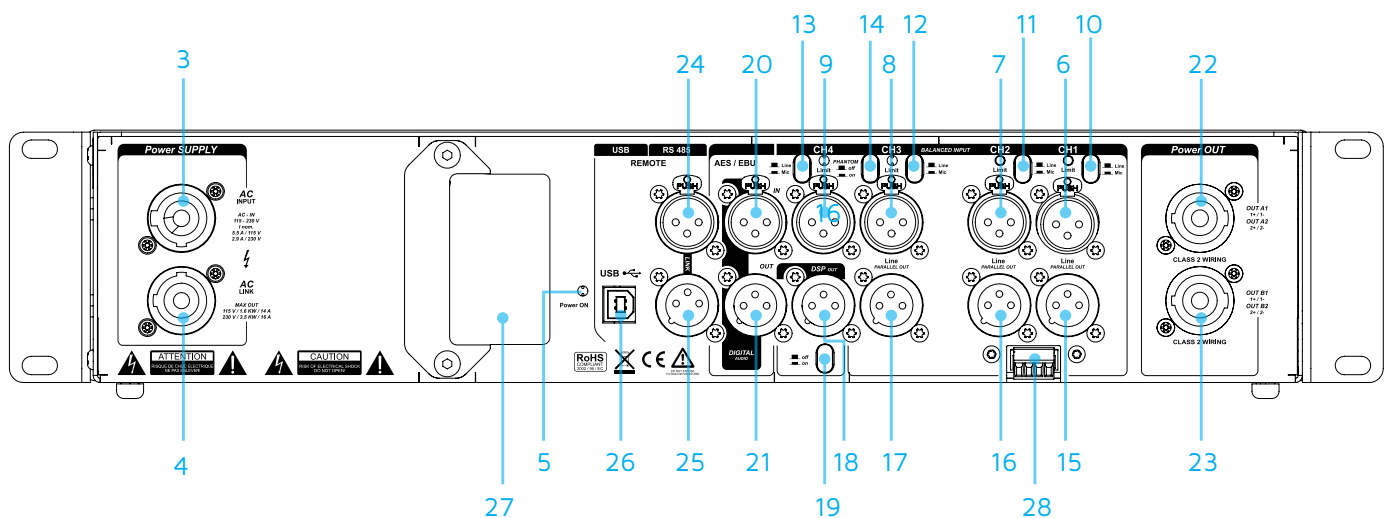


10. FRONT PANEL

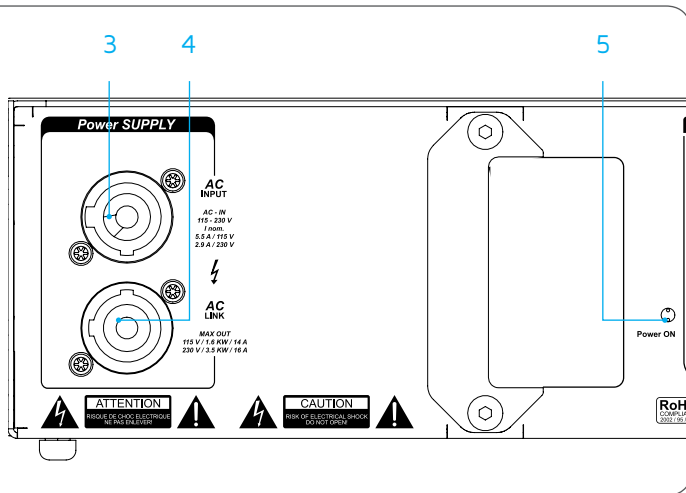


1. TOUCH SCREEN Control panel. Provides access to the main functions of the DSP on board (see Section 12)
2. POWER SWITCH. Turns the amplifier on and off.

11. BACK PANEL

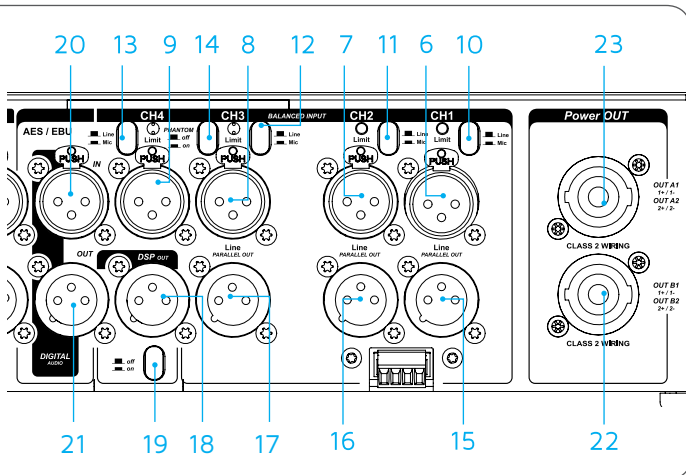


11.1 POWER SUPPLY



3. AC INPUT. PowerCon for AC power.
4. AC LINK. PowerCon output for feeding AC mains power to additional K-array components with a powercon AC input socket.
5. POWER ON LED. Indicates the amplifier is ON.

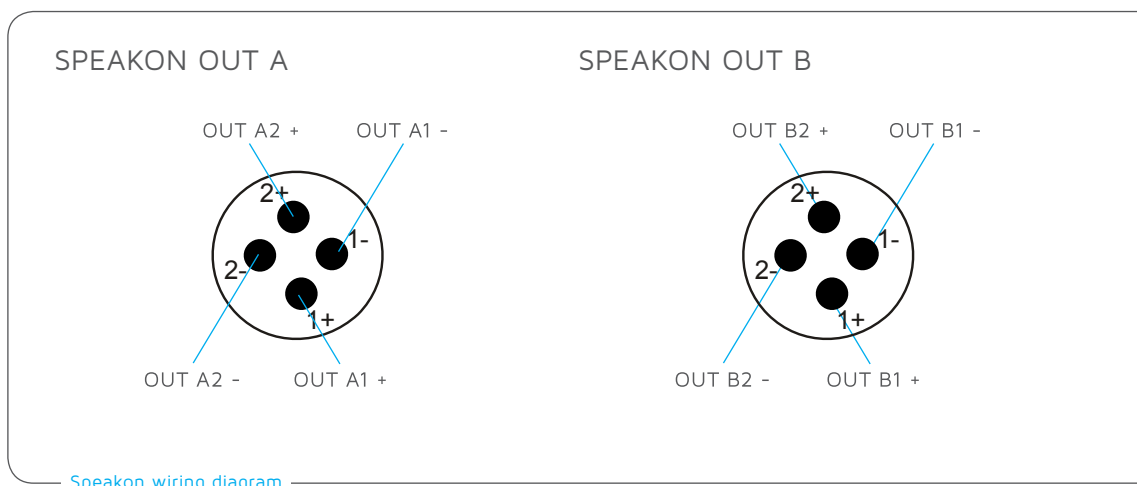
11.2 AUDIO CONNECTIONS



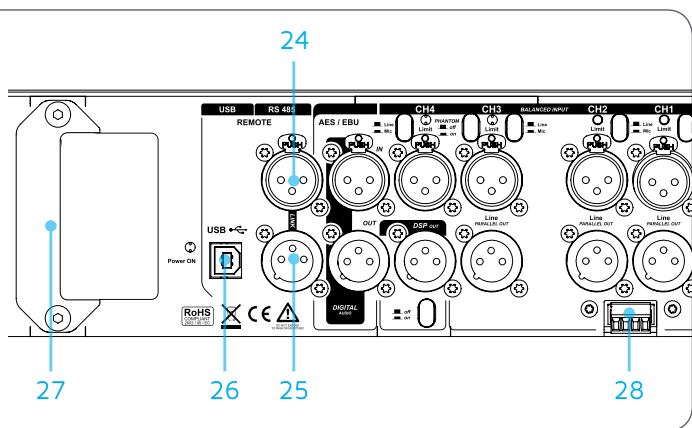
6. CH 1 MIC/LINE INPUT. XLR analog input, with selectable sensitivity for Mic (-30 dBu) or Line (+4 dBu).
7. CH 2 MIC/LINE INPUT. XLR analog input, with selectable sensitivity for Mic (-30 dBu) or Line (+4 dBu).
8. CH 3 MIC/LINE INPUT. XLR analog input, with selectable sensitivity for Mic (-30 dBu) or Line (+4 dBu).
9. CH 4 MIC/LINE INPUT. XLR analog input, with selectable sensitivity for Mic (-30 dBu) or Line (+4 dBu).
10. CH 1 MIC/LINE SWITCH. Selects CH 1 input sensitivity for Mic (pressed) or Line (depressed) level.

11. CH 2 MIC/LINE SWITCH. Selects CH 2 input sensitivity for Mic (pressed) or Line (depressed) level.
12. CH 3 MIC/LINE SWITCH. Selects CH 3 input sensitivity for Mic (pressed) or Line (depressed) level.
13. CH 4 MIC/LINE SWITCH. Selects CH 4 input sensitivity for Mic (pressed) or Line (depressed) level.
14. PHANTOM POWER SWITCH. Turns phantom power (48 V) on (pressed) / off (depressed) on CH 1, CH 2, CH 3, CH 4 inputs (only for channels with MIC/LINE SWITCH pressed).
15. CH 1 PARALLEL OUT. XLR parallel output, providing a direct signal from the CH 1 Input. This output cannot be processed or controlled via the K-Framework software.
16. CH 2 PARALLEL OUT. XLR parallel output, providing a direct signal from the CH 2 Input. This output cannot be processed or controlled via the K-Framework software.
17. CH 3 PARALLEL OUT. XLR parallel output, providing a direct signal from the CH 3 Input. This output cannot be processed or controlled via the K-Framework software.
18. CH 4 PARALLEL OUT OR DSP OUT. This XLR connector provides a direct signal from the CH 4 Input when the switch 19 is depressed. In that case, this output cannot be processed or controlled via the K-Framework software. Otherwise, when the switch 19 is pressed, this XLR acts as an auxiliary XLR balanced output, controlled via the K-Framework software. Users can select the signal routed to this output and manage its amplitude and EQ individually.

- 19. CH 4 LINK OUT/DSP OUT SWITCH. Press the switch to use output 18 as an auxiliary XLR balanced output controlled via the K-Framework software.
- 20. CH 5/6 AES/EBU INPUT. XLR input connector for two-channel AES/EBU digital audio, accepting sample rates from 32 kHz – 96 kHz.
- 21. CH 5/6 AES/EBU OUTPUT. XLR output, providing two-channel digital audio from ch 5/6 AES/EBU input, at a sample rate of 48 kHz.
- 22. POWER OUT A. Speakon output to drive passive speakers. 1+/1- provides OUT A1, 2+/2- provides OUT A2.
- 23. POWER OUT B. Speakon output to power passive speakers. 1+/1- provides OUT B1, 2+/2- provides OUT B2.



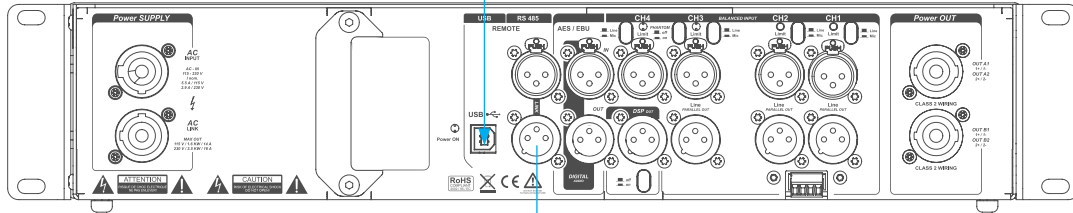
11.3 REMOTE CONTROL



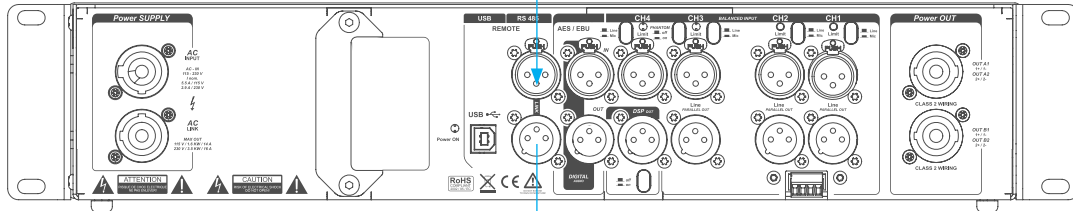
- 24. REMOTE RS485 LINK INPUT. XLR input for connecting the amplifier from another RS485 device in a K-Framework network. RS485 Link Input can also be used to connect a computer running the K-Framework software (requires K-USB USB-to-RS485 adapter).
- 25. REMOTE RS485 LINK OUTPUT. XLR output for connecting additional RS485 devices in a K-Framework network.

- 26. REMOTE USB Input. Connects a computer running the K-Framework software, for remote control of the amplifier. Users can manage an entire network of RS485 devices with one PC connected via USB.
- 27. EXTENSION CONNECTOR. Multi-pin connector for various K-array extension modules, for wireless control and audio transmission, memory extension, digital signal encoding and audio reproduction.
- 28. KA-POT1 CONNECTOR. These two analog GPIO ports allow the user to control same amplifier’s parameters using the K-POT1 accessory. See Section 14 for further information about these feature.

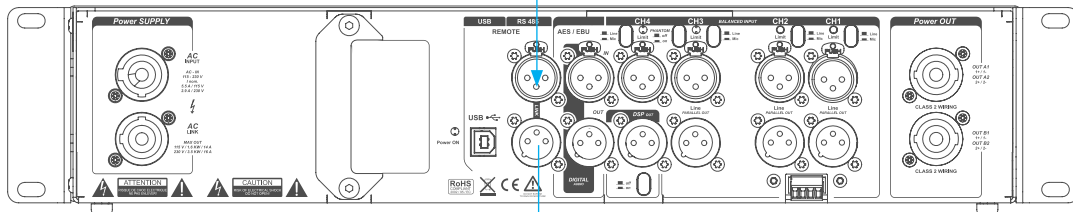
USB connection from a PC



RS485 XLR LINK



RS485 XLR LINK



Next device in the K-framework network

RS485 network

12. TOUCH SCREEN FUNCTIONS

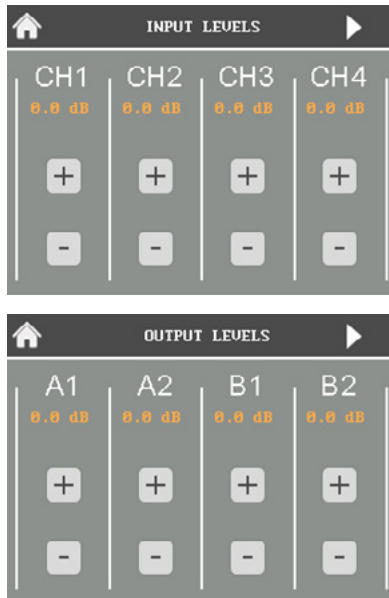
The main functions of the onboard DSP can be managed with the integrated touch screen. Functions are grouped into six pages, shown as icons on the Home page.

HOME PAGE



To reach the Home page from any other page, touch the Home button.

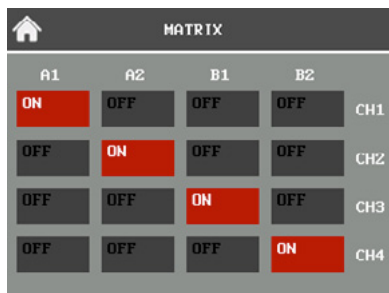
LEVELS



The Levels page allows users to independently manage the amplitude of all the four input channels and all the four output channels.

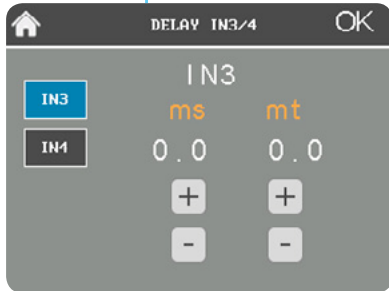
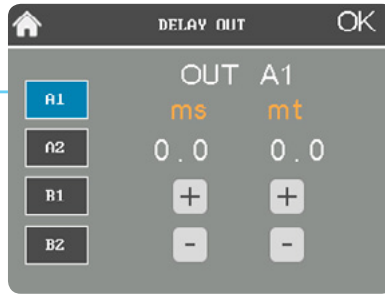
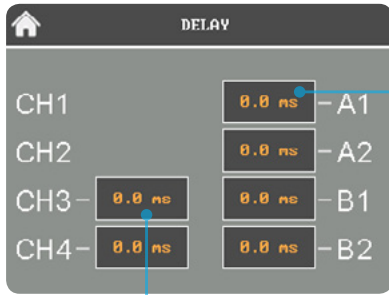
Click the arrow button on the top right corner to switch between Input levels page and Output levels page.

MATRIX



The Matrix page allow users to manage the routing of the four input channels to the four output channels.

DELAY



The Delay page allows users to independently set the delays for the four output channels (up to 3.5 mt) and for Channel 3 and Channel 4 input channels (up to 114 mt).

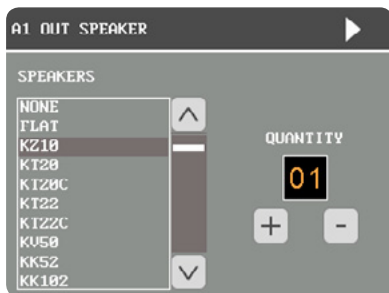
Pressing on a delay value, users can set the delay in ms or in mt. Press the OK button to return to the Delay page.

CONFIGURATION

SPEAKER	IMP	QT	MATCH	QT	OUT
KZ10	16	01	KMT12P	01	A1
FLAT	04	01	NONE	00	A2
FLAT	04	01	NONE	00	B1
FLAT	04	01	NONE	00	B2

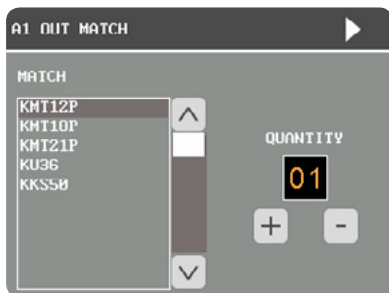
Before connecting the speakers to the amplifier, follow the instructions below.

Warning. Failure to follow these instructions could result in serious damage to the speakers connected to the amplifier!



Go to the Configuration page and press the SETUP button. Insert the model and the number of speakers connected to Output A1. Press the arrow button on the top right corner.

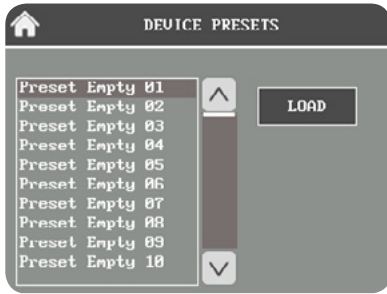
Insert the model and the number of speakers you want to match to the previous ones. For example if you have two KP102 mid-high arrays connected to an A1 output and a KMT21P sub connected to another output (or to another amplifier) select KMT21P to the A1 Out Match page and the DSP will compute automatically the crossover setting to obtain a perfect match between the speakers. Press the arrow button on the top right corner. Repeat step 2 and 3 for all other outputs. At the end you will return to the main Configuration page. Press APPLY to load all settings. The DSP will automatically adjust the output gain and the crossover on each output channel to match the requirement for the speakers connected.



Warning. If you are using speakers with selectable impedance, pay attention to set the value indicated in the Configuration page!



PRESET



The Preset page allows users to load presets stored on-board.

INFO



The Info page contains information about the current software and firmware, and the Board ID of the amplifier. The Board ID is automatically assigned to the amplifier unit when connected to a K-Framework network.

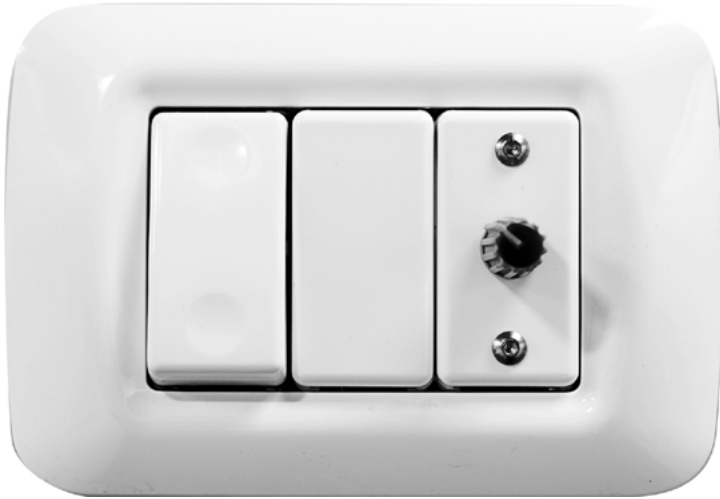
13. REMOTE CONTROL SOFTWARE

All amplifier functions, including signal routing, output configuration, channel equalization and delay can be controlled via K-Framework software.

To download your free K-Framework software and K-Framework User Guide, please navigate to the K-array "K-Framework" page located at <http://www.k-array.com/framework>

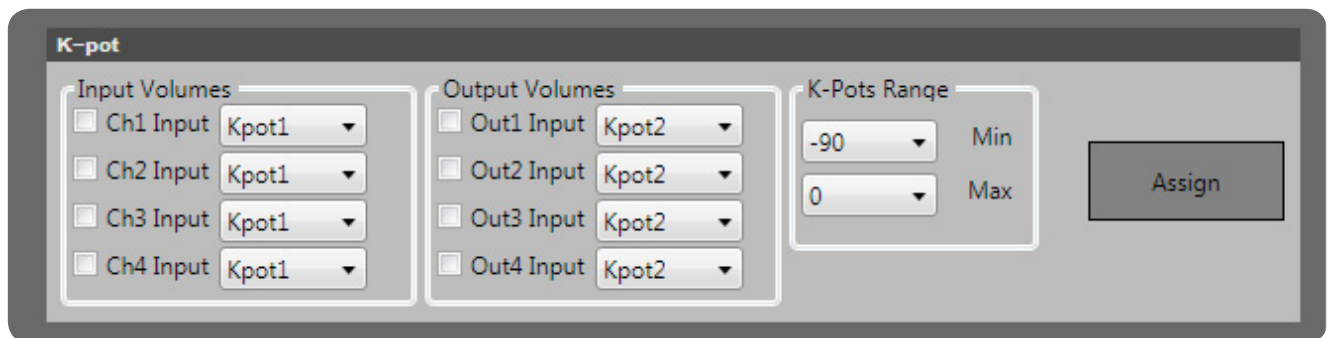
14. KA-POT1 ACCESSORY

KA-POT1 allows users to control input channels and output channels levels with a potentiometer installed in a standard box for switches. It is possible to connect up to two independent KA-POT1 to each amplifier in order to control two independent levels.



14.1 CHANNEL LEVELS ASSIGNMENT

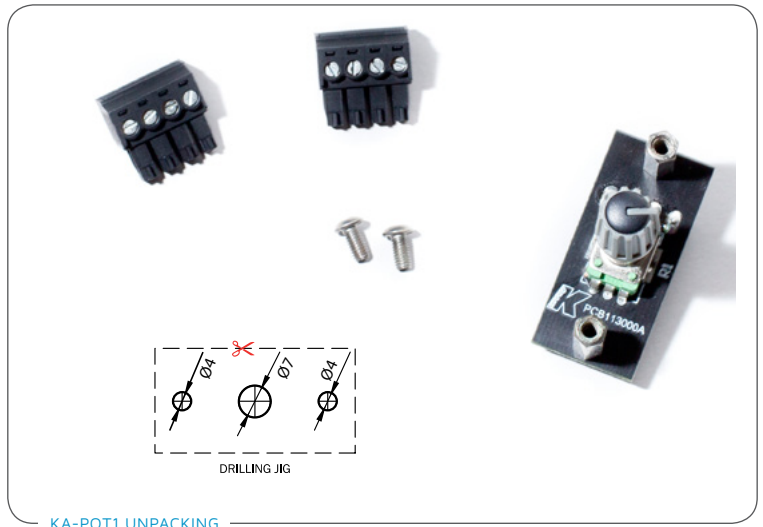
To assign each KA-POT1 an amplifier parameter, connect a computer running the K-framework software and follow the instruction you find in the K-framework manual. As shown in the window below, users can assign each KA-POT1 one or more channel levels. In the example below, the first KA-POT1 controls all input channel volumes and the second controls all output channel volumes.



14.2 ASSEMBLING AND WIRING

The KA-POT1 pack is composed of:

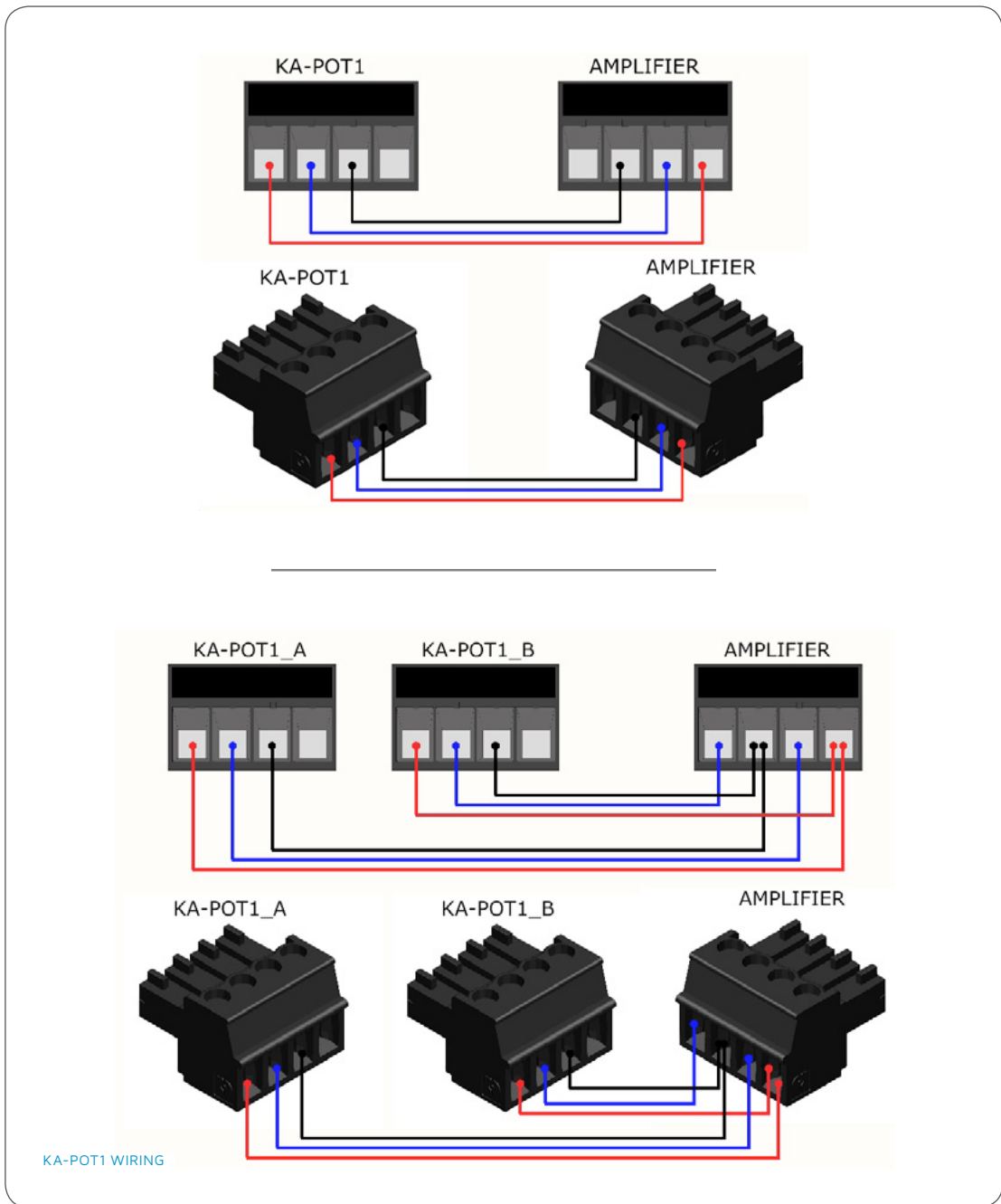
- PCB with potentiometer
- 2 x screws M3X6
- 2 x 4-pin connector plugs
- Drilling jig



Position the drilling jig on an appropriate box and make the three holes. Install your cap in a box for switches and insert the PCB with the potentiometer coming out from the center hole. Secure with the two included screws. Cover the potentiometer with the gray knob.



Follow the wiring scheme below to connect the 4-pin connector plugs. Follow the scheme on the top if you own only one KA-POT1 and the one on the bottom if you own two KA-POT1. Then insert one plug in the PCB and the other into the GPIO port on the amplifier.



15. SERVICE

To obtain service:

- 1) Contact the official K-array distributor in your country. Your local distributor will direct you to the appropriate service center.
- 2) If you are calling for service, please have the serial number(s) of the unit(s) available for reference. Ask for Customer Service, and be prepared to describe the problem clearly and completely.
- 3) If the problem cannot be resolved over the phone, you may be required to send the unit in for service. In this instance, you will be provided with an RA (Return Authorization) number which should be included on all shipping documents and correspondence regarding the repair. Shipping charges are the responsibility of the purchaser.

Any attempt to modify or replace components of the device will invalidate your warranty. Service must be performed by an authorized K-array service center.



Cleaning:

Use only a soft, dry cloth to clean the housing. Do not use any solvents, chemicals, or cleaning solutions containing alcohol, ammonia, or abrasives. Do not use any sprays near the product or allow liquids to spill into any openings.

16. SPECIFICATIONS

	KA24	KA84
	Power Output	
Max Power @ 4Ω	4 x 600 W ⁽¹⁾	4 x 2000 W ⁽¹⁾
Max Power @ 8Ω	4 x 300 W ⁽¹⁾	4 x 1000 W ⁽¹⁾
Max Power bridged @ 8Ω	2 x 1200 W ⁽¹⁾	2 x 4000 W ⁽¹⁾
Minimum impedance	4 Ω (single channel mode) 8 Ω (bridge mode)	
	Audio specs	
Slew rate 8 Ω	50V/μS (input filter bypassed)	
Distortion (THD + N)	< 0.09% 1W to full power @ 4Ω (typically <0.05%)	
Input impedance	10 kΩ balanced	
Gain	26 dB	32 dB
Output	Unbalanced to ground	
Bandwidth	20Hz 20KHz (+1dB)	
Damping factor	> 10000 @ 100Hz	
	Protection	
Thermal	Yes	
Short circuit / over-load	Yes	
Clip limit, Analog signal limit	Yes	
	Audio Input	
Analog Connectors	4 male + 4 female 3-pin balanced XLR	
Digital Connectors	1 male + 1 female 3-pin XLR	
	Remote control Input	
Connectors	1 male + 1 female XLR parallel / 1 USB B Jack serial converter	
	Audio powered Output	
Connectors	2 x 4-pin Speakon NL4	
NL4 1 wiring	1+1- = A1 2+2- = A2	
NL4 2 wiring	1+1- = B1 2+2- = B2	
	AC power	
Connector	2 x PowerCon IN/OUT	
Nominal voltage	100 / 240 V, 50/60Hz with PFC	
Operating Range	AC 90V - 264V	
Efficiency	>79%(typical)	
1/8 rated power (pink noise)@ 8Ω	220 W	600 W
Thermal dissipation	1/8 of max output power @ 4Ω	
	180 BTU/h	621 BTU/h
	1/4 of max output power @ 4Ω	
	396 BTU/h	1154 BTU/h
	Certification	
IP	20	
	Physical	
Dimensions	426 mm x 304 mm x 88.2 mm (19.1" x 12" x 3.5 ")	
Weight	5.5 Kg (12.12 lb)	6.1 Kg (13.45 lb)
	<small>Notes for data</small> 1. EIAJ Test Standard, 1KHz, 1%THD New materials and design are introduced into existing products without previous notice. Present systems may differ in some respects from those presented in this catalogue.	



DECLARATION OF CONFORMITY

Manufacturer/Importer: K-array s.u.r.l.

Brand: K-ARRAY
Address: via Paolina Romagnoli 17 50037 S. Piero a Sieve Firenze ITALY

Date of Issue: 03 / 06 / 14

Model Code: KA24
Declaration: Complies with safety essential requirements of Council Directive

2004/108/EC on the approximation of the Laws of the Member States relating to electromagnetic compatibility,
 2006/95/EC on the harmonisation of the laws of member state relating equipment designed for the use within certain voltage limits
 This declaration applies to all specimens manufactured in accordance with the attached manufacturing drawings which form part of this declaration. Assessment of compliance of the product with the requirements relating to electromagnetic compatibility and low voltage directive was based on the following standards:

EMC:

EN 55103-1-2009
 EN 55103-2-2009
 EN 61000-3-2-2006+A1+A2
 EN 61000-3-3-2008

Safety:

EN 60065:2002+A1+A11+A2+A12

Marking:



Applying Year: 2014

Applied by:

K-array s.u.r.l.
 Via Paolina Romagnoli 17
 50037 S. Piero a Sieve
 Firenze Italy
 Tel. +39 055 8487222
 Fax +39 055 8487238

Signed by:

Franco Spataro
 Technical Manager

K-array s.r.l. a socio unico società soggetta alle attività di direzione e coordinamento di HP Sound Equipment srl
 P. IVA / VAT / CF 06206990480 - R.E.A. 609589 Cap. soc. i.v. € 100.000,00

Sede legale: via Paolina Romagnoli 17 50037 San Piero a Sieve - Firenze - ITALY tel +39 055 8487222 fax +39 055 8487238 info@k-array.com www.k-array.com

DECLARATION OF CONFORMITY

Manufacturer/Importer: K-array s.u.r.l.

Brand: K-ARRAY
Address: via Paolina Romagnoli 17 50037 S. Piero a Sieve Firenze ITALY

Date of Issue: 03 / 06 / 14

Model Code: KA84
Declaration: Complies with safety essential requirements of Council Directive

2004/108/EC on the approximation of the Laws of the Member States relating to electromagnetic compatibility,
 2006/95/EC on the harmonisation of the laws of member state relating equipment designed for the use within certain voltage limits
 This declaration applies to all specimens manufactured in accordance with the attached manufacturing drawings which form part of this declaration. Assessment of compliance of the product with the requirements relating to electromagnetic compatibility and low voltage directive was based on the following standards:

EMC:

EN 55103-1-2009
 EN 55103-2-2009
 EN 61000-3-2-2006+A1+A2
 EN 61000-3-3-2008

Safety:

EN 60065:2002+A1+A11+A2+A12

Marking:



Applying Year: 2014

Applied by:

K-array s.u.r.l.
 Via Paolina Romagnoli 17
 50037 S. Piero a Sieve
 Firenze Italy
 Tel. +39 055 8487222
 Fax +39 055 8487238

Signed by:

Franco Spataro
 Technical Manager

K-array s.r.l. a socio unico società soggetta alle attività di direzione e coordinamento di HP Sound Equipment srl
 P. IVA / VAT / CF 06206990480 - R.E.A. 609589 Cap. soc. i.v. € 100.000,00

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