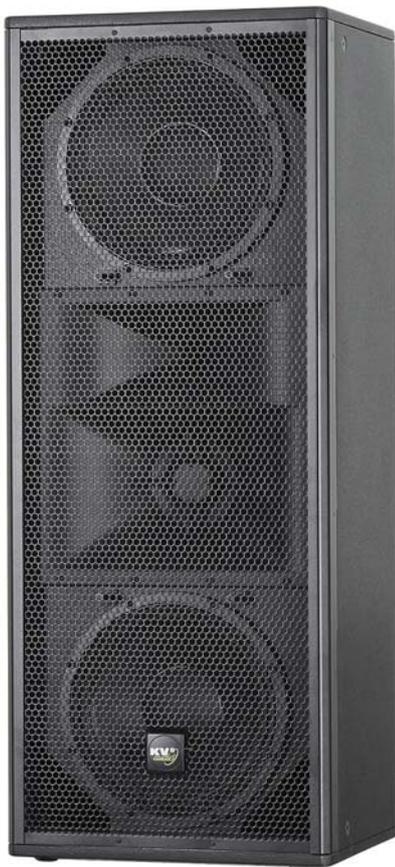
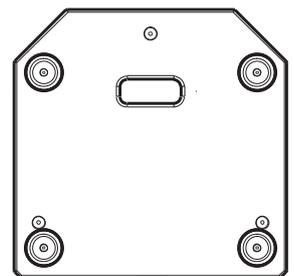
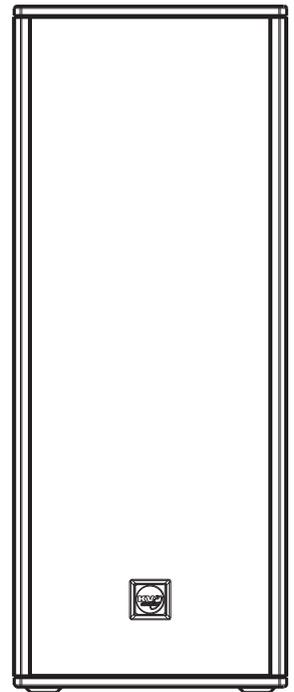
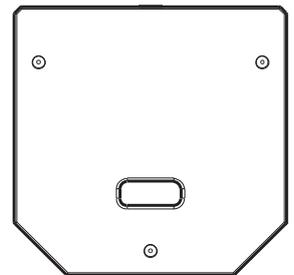




ESR Series User Guide



- **ESR2800**
- **ESR212**



The future of sound. Made perfectly clear.

At KV2 Audio our vision is to constantly develop technologies that eliminate distortion and loss of information providing a true dynamic representation of the source.

Our aim is to create audio products that absorb you, place you within the performance and deliver a listening experience beyond expectation.

ESR series

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ESR2800



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ESR212



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Thank you for purchasing this KV2 Audio, ESR series system, consisting of the ESR2800 stereo controller/amplifier unit, two ESR212 speakers and optional variants of subwoofers.

The ESR range has been developed for a particular niche in the market, where an all in one box is needed to give clear detailed reproduction over a wide area. The ESR212 and 215 are three way full range enclosures with wide dispersion characteristics. They can be used vertically for theatre, church or cultural centre type installations, or horizontally mounted to give excellent coverage over a tiered seating area for stadium or grandstand type applications.

Similar to our popular ES range, the ESR cabinets are fully active and driven by a proprietary amplifier, which delivers equalized, and time aligned accurate signal to each of the components. Two ESR212 cabinets can be driven by a single ESR2800 High Definition Amplifier, which houses all signal processing and amplification, as well as providing control for two different external subwoofer cabinet configurations if required.

In situations where extended bass response is not needed, but full range high definition audio reproduction with extremely good coverage is required, the ESR Range offers an ideal solution. Economies of scale are achieved by the requirement of only one ESR amplifier, to run a three way active stereo system where other systems would require processors and multiple amplifiers to achieve a similar configuration.

This manual contains important information on operating the ESR system correctly and safely. Please take some time and read this manual to familiarize yourself with the advanced features of this system.

The ESR2800 Amplifier is a three-way, active control and amplification system, specifically designed for the KV2 Audio ESR series loudspeaker systems. It houses all signal processing and amplification, as well as providing control for external subwoofer cabinet configurations, and to operate additional subwoofer cabinets if needed. External subwoofers are powered by the external subwoofer amplifier (VHD3200).

The amplifier compliment and configuration inside the ESR2800 Amplifier is as follows:

High Frequency - 100-watt, Class AB, Push pull, Low intermodulation design.

Mid Frequency - 200-watt, Class AB, Push pull, Low intermodulation design.

Low Frequency - 1000-watt, High-efficiency, Current-enhancing switch mode technology with Linear Active Filter.

In most cases it would be advisable to use a KV2 Audio Line driver (LD4) in addition at the mixer end, to ensure that the line to the amplifier is driven correctly and the signal integrity maintained.

Although this system is simple to operate, improper use can be dangerous. This is a very high-powered device that can put out high voltages and sizeable currents. Always use safe operating techniques with the SL series system.

FOR YOUR SAFETY, READ THE IMPORTANT PRECAUTIONS SECTION AS WELL AS THE INPUT, OUTPUT AND POWER CONNECTION SECTIONS OF THIS MANUAL.

Warranty

Your ESR System is Warrantied against defects in material and workmanship. Please refer to your supplier for more warranty details.

Service

WARNING! Electronic components, risk of SHOCK!

In the unlikely event that your product requires service, it must be returned to an authorized KV2 Audio distributor, service centre or shipped directly to the factory.

All warranty and service repairs must be undertaken by qualified technical personnel.

If the unit/s need to be shipped back to the factory, we advise using the original packing to reduce the risk of damage in transit.

Please contact your nearest KV2 Audio centre for service details. Distributors list can be found at www.kv2audio.com.

ESR 2800 VERY HIGH DEFINITION AMPLIFIER

ESR2800 Amplifier Rack mounted



ESR2800 - 250V part num. *KVV 987 285*
ESR2800 - 230V part num. *KVV 987 283*
ESR2800 - 115V part num. *KVV 987 284*

ESR2800 is dedicated for use only with ESR12 speakers

ESR12 - The Ultimate Full Range System



part num. *KVV 987 247*

For extended bass systems the ESR2800 is equipped with internal crossovers.

You can use one, or a combination of many active KV2 Audio Bass Modules (EX Series), or you can use any passive bass speakers with proprietary amplifier (VHD3200 with VHD / ES / ESD subwoofers)

VHD3200 - Sub Woofer Amplifier



VHD3200-250V *KVV 987 176*
VHD3200-230V *KVV 987 083*
VHD3200-115V *KVV 987 084*

Features

- The ESR2800 Amplifier is a stereo, three-way, active control and amplification system specifically designed for the KV2 Audio ESR Series - ESR12 The Ultimate Full Range System
- Houses all signal processing and amplification as well as providing control for external subwoofer cabinet configurations.
- External subwoofer is powered by the external subwoofer amplifier (VHD3200).

• The amplifier compliment inside the ESR2800 Amplifier is as follows:

- High Frequency - 100-watt, Class AB, push pull, low intermodulation design
- Mid Frequency - 200-watt, Class AB, push pull, low intermodulation design
- Bass - 1000-watt, high-efficiency, current-enhancing switch mode technology with Linear Active Filter

Unpacking

Unpack the ESR2800 Amplifier and check for any damage. If you find any damage, notify your supplier immediately. Only the consignee may institute a claim with the carrier for damage incurred during shipping. Be sure to save the carton and all packing materials for the carrier's inspection.

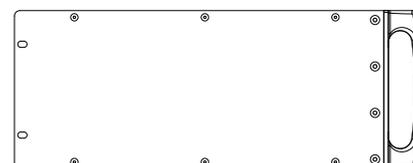
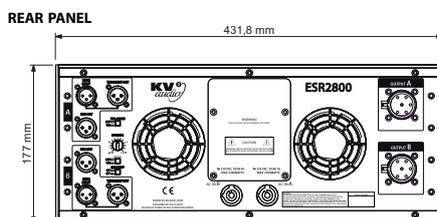
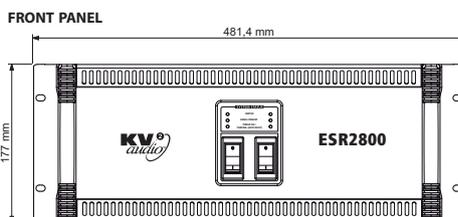
Should you ever need to ship the unit, only use the original factory packaging. If the shipping carton is unavailable, contact your supplier to obtain a replacement.

The ESR2800 Amplifier carton should contain:

- ESR2800 Amplifier control unit
- This user guide
- Two PowerCon detachable power cables

Amplifier rack mounting

The ESR2800 Amplifier will mount in standard 19" rack systems. Integral rear mounting rack ears are also provided for additional support, do not rely on fixing and mounting the amplifier using just the front panel as support. Use eight screws and washers to mount the amplifier to the equipment rack rails. We recommend using a shock mounted rack for touring use to prolong the life of your amplifier.



Cooling

The ESR2800 Amplifier has a comprehensive cooling system featuring chassis sealed PCB board mounting and shock mounted, speed controlled fans. This means that the cooling system never drives air across PCB boards, connectors or components, ensuring prolonged electronic component lifespan and minimizing maintenance cycles.

Air is drawn into the front of the amplifier by the two fans on the rear panel, this passes over the cooling fans of the heat sinks and exhausts through the rear. If the heat sink gets too hot, its sensing circuit will open the output relay, disconnecting the load.

It is important to have an adequate air supply at the front of the amplifier, and enough space around the rear of the amplifier to allow the cooling air to escape. If the unit is rack mounted, do not use doors or covers on the rear of the rack, the exhaust air must flow without restriction. If you are using racks with closed backs, use fans on the rear rack panel to ensure an ample air supply.

NOTE: The filters at the top and bottom of the front panel must be kept clean and free of dust and dirt to allow full operation-CHECK PERIODICALLY

AC Requirements

Two PowerCon cables are provided to connect the ESR2800 Amplifier to a suitable AC power supplies. Each cable powers each separate amplifier channel for sufficient current delivery.

The PowerCon is a connector without breaking capacity, i.e. the PowerCon should not be connected or disconnected under load or while it is live. Always isolate your AC supply before disconnecting the PowerCon connector.

The ESR2800 amplifier operates in either 115V, 230V or 250V modes. Although pre-configured at the factory, the unit's operating voltage mode can be changed in the field. Amplifier power plug must remain readily operable.

Your amplifier will be supplied preset to the voltage used in your area. The table below provides typical current draw figures for the ESR2800 Amplifier.

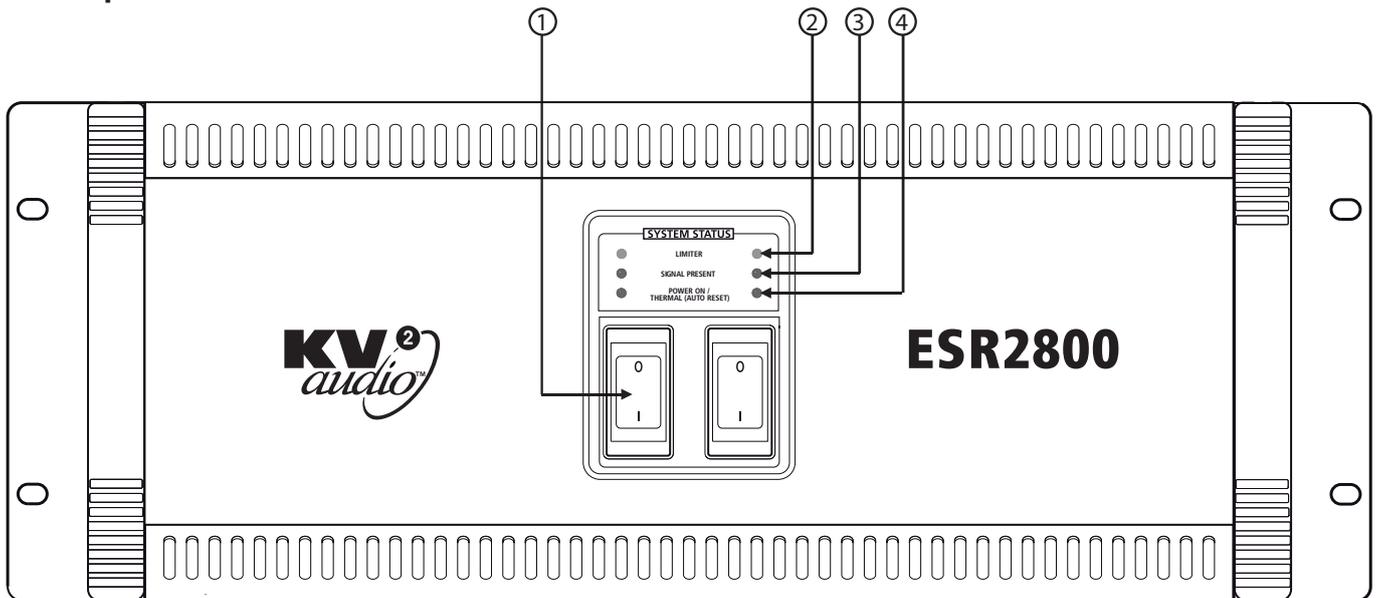
The receptacle must be connected to a fuse or circuit breaker. Connection to any other type of receptacle poses a shock hazard and may violate local electrical codes.

Do not allow water or any foreign object to get inside the amplifier. Do not put objects containing liquid on or near the unit. To reduce the risk of overheating the amplifier, avoid exposing it to direct sunlight. Do not install the unit near heat-emitting appliances, such as a room heater or stove. This amplifier contains potentially hazardous voltages. Do not attempt to disassemble the unit. The unit contains no user serviceable parts, repairs should be performed only by factory trained service personnel.

AC Input	Current draw with amplifier running at Average Power (Each Channel)	Current draw with amplifier running at Peak Power (Each Channel)
250V	3.2A	5A
230V	3.5A	5.4A
115V	7A	11A

Current draw of ESR2800 Amplifier

Front panel



1) AC Mains Switch

The ESR2800 Amplifier has a combination AC Main switch/circuit breaker on the front panel. If the switch shuts off during normal use, push it back to the ON position once. If it will not stay on you should take the unit to qualified service personnel to have it serviced.

2) LIMITER

Yellow LED, indicates that the audio limiter has been activated. This RMS limiter protects speakers against overload.

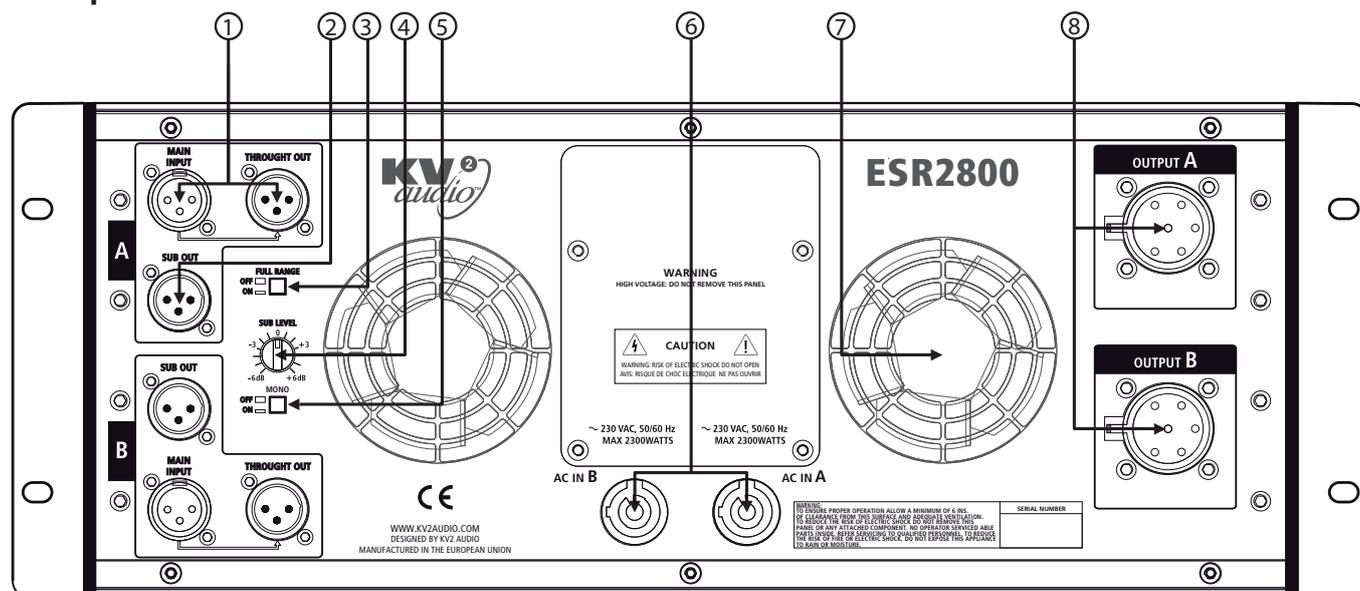
3) SIGNAL PRESENT

Green LED indicates when audio signal is present at the amplifier input.

3) POWER ON/ THERMAL (AUTO RESET)

Green LED indicates that the AC power is on. When red, it indicates that the thermal limit of the ESR2800 Amplifier has been exceeded and the unit has shut down.

Rear panel



1) MAIN INPUT / TROUGHT OUT

This is the main system input balanced XLR connector with associated Through Signal Output connector for sending unprocessed signal to other devices in a system.

2) SUB OUT

Balanced XLR output connector, used to connect additional subwoofer. Output is active even when FULL RANGE switch is ON.

3) FULL RANGE

Switch, selects the amplifier crossover setup, when ON full range signal is reproduced by ESR212 cabinets, when OFF signal is by frequency band in conjunction with the subwoofer output setup.

4) SUB LEVEL

This is the level control for the External Sub output in the range -6 to +6 dB.

5) MONO

Switch, sets SUB OUT outputs summing SUB OUT outputs channel A and B together.

6) PowerCon Power Connectors

The ESR2800 Amplifier uses two connectors per two channel. Each connector supplies one channel. They accept standard PowerCon terminated AC Mains cables.

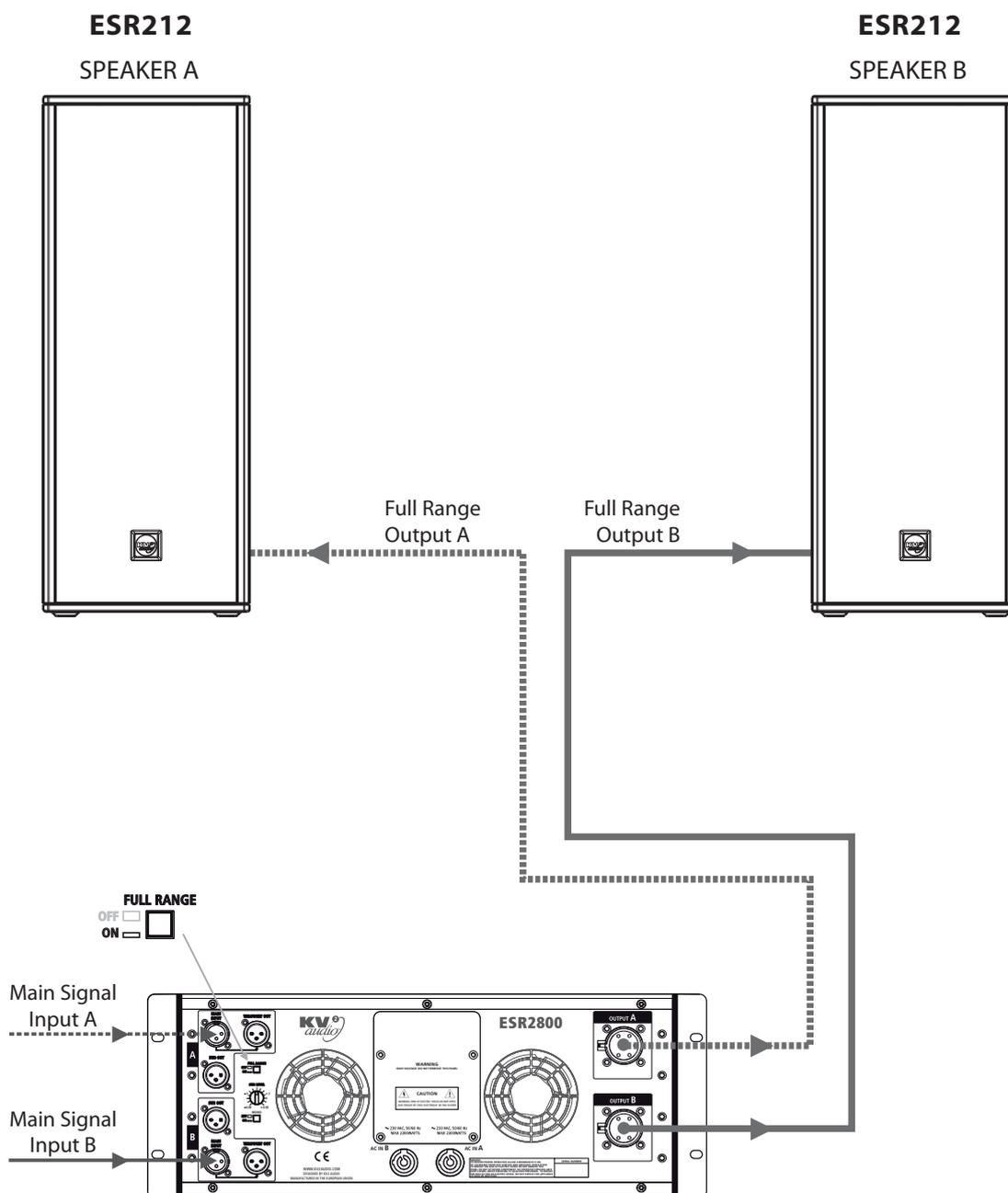
7) Fans

The cooling fans operate continuously while the amplifier is on. An internal temperature sensor increases the speed of the fans during high temperature conditions. Air enters through the front grille and exits through the rear. Be sure to allow adequate air flow to the front of the rack in which the ESR2800 Amplifier is mounted.

8) Speaker EP6 Connectors

Accepts a standard EP6 terminated loudspeaker cable for connecting up to a single ESR212 cabinet. We recommend using 2.5mm/core cables.

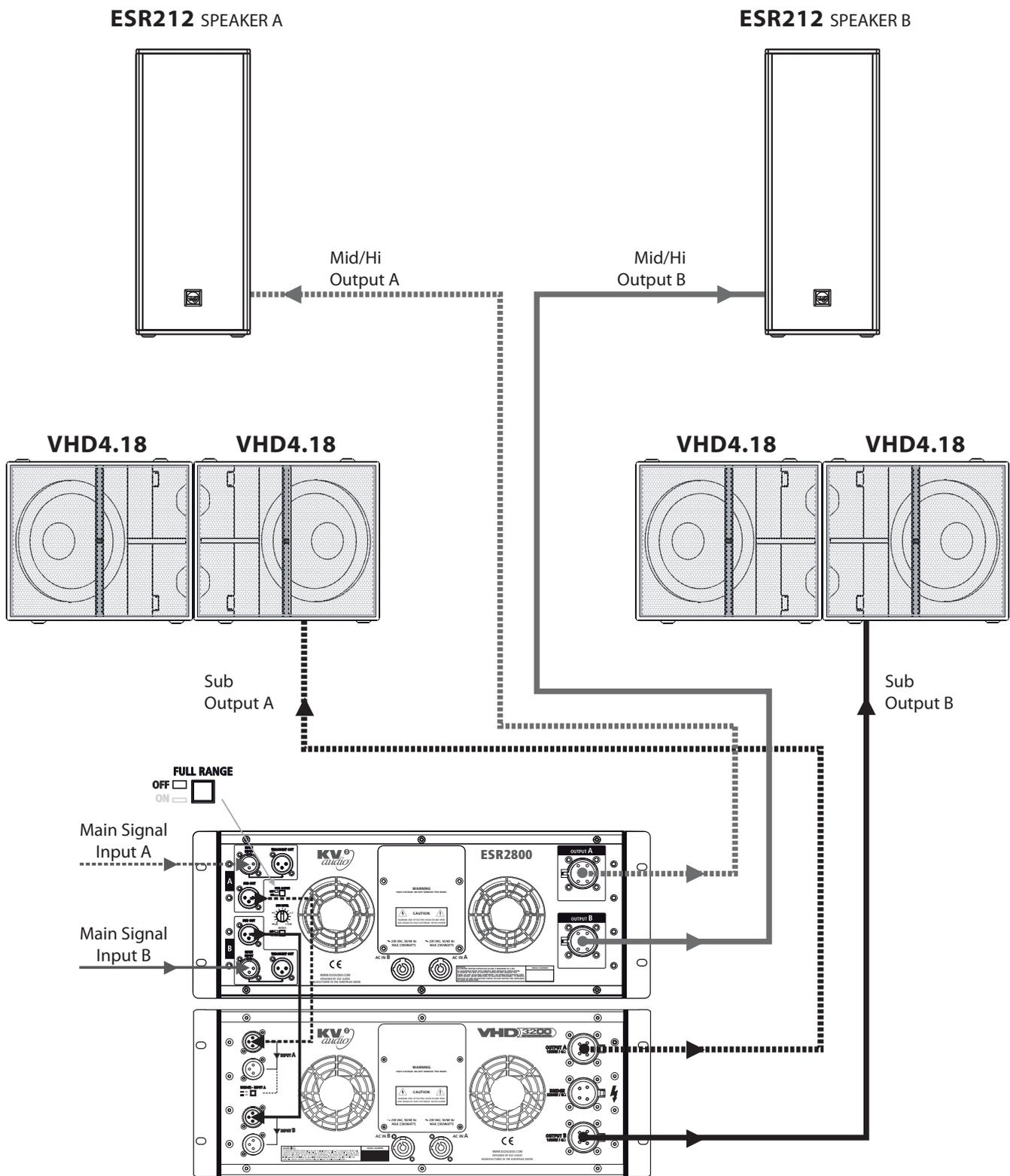
Full range setup



Set ESR2800 Amplifier to FULL RANGE ON mode. ESR212 cabinets play full range signal.

External subwoofer setup

ESR2800



Set ESR2800 Amplifier to FULL RANGE OFF mode. Signal is crossed over at Hi/Mid for ESR212 cabinets and SUB for external subwoofer.

SUB SET UP LEVEL setting depends on which subwoofer unit is used.

Output Channels	
Number of Channels	2 (stereo)
Total Output Power	2x 1300W

High Frequency Amplifier Specification	
Type	Class AB - Push Pull - Low IM Design Transformer balanced output
Rated Continuous Power	100W
Distortion	<0.02%
Operating Bandwidth	2,5kHz ÷ 40kHz

Mid Frequency Amplifier Specification	
Type	Class AB - Push Pull - Low IM Design Transformer balanced output
Rated Continuous Power	200W
Distortion	<0.02%
Operating Bandwidth	400Hz ÷ 2,5kHz

Low Frequency Amplifier Specification	
Type	High efficiency, Current-enhancing switch mode
Rated Continuous Power	1000W
Distortion	<0.02%
Operating Bandwidth	35Hz ÷ 400Hz

Signal Input	
Input Sensitivity	1V RMS
Input Impedance	20kΩ (balanced)

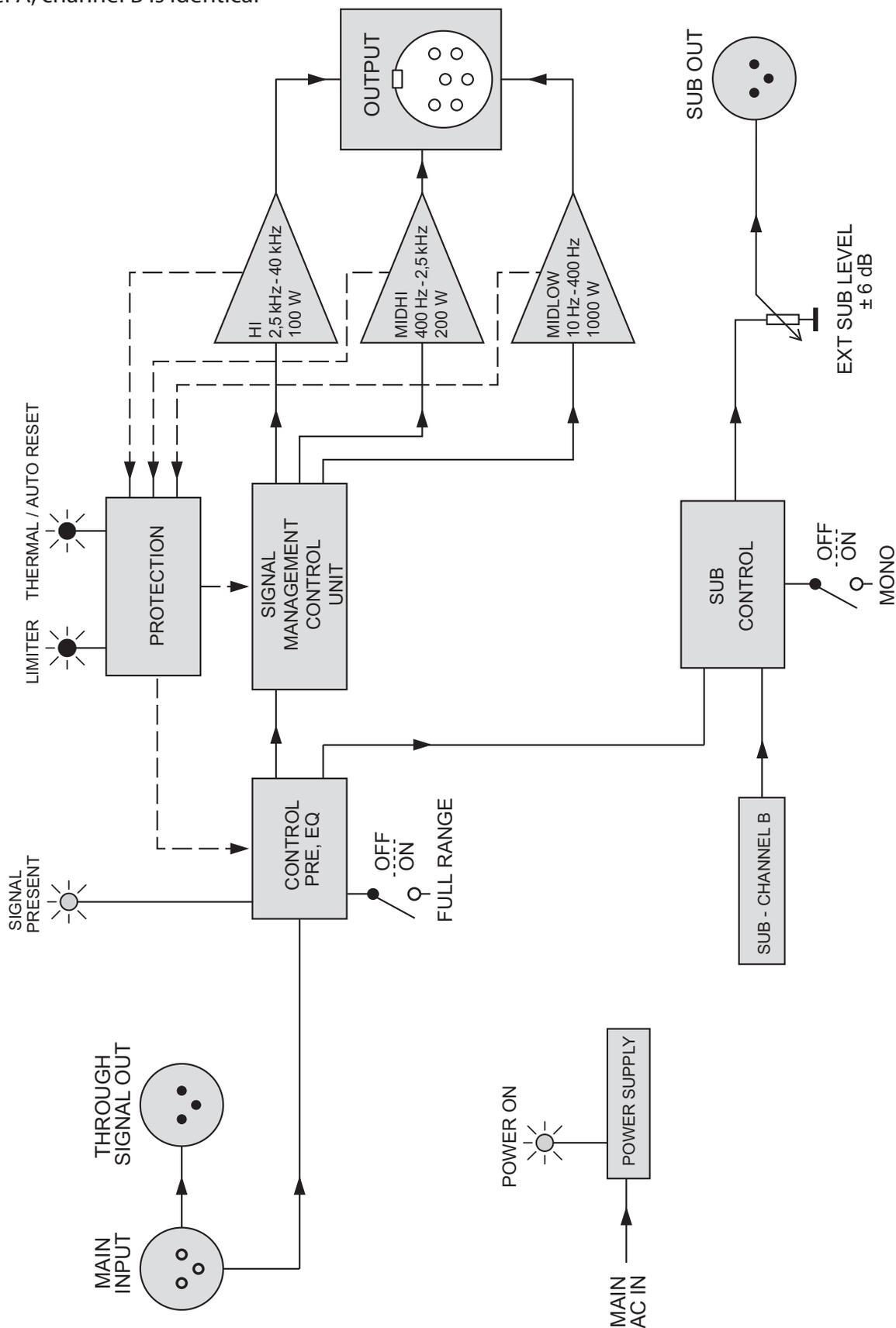
Speaker Output	
Speaker Output	2x EP6

Power	
Power Connector	2x Neutrik PowerCon®
Operating Voltage	115V / 230V / 250V
Operating Voltage Range	100 ÷ 120V@60Hz 205 ÷ 240V@50Hz 225 ÷ 260V@50Hz
Recommended Amperage	2x10A 115V 2x5A 230V 2x5A 250V

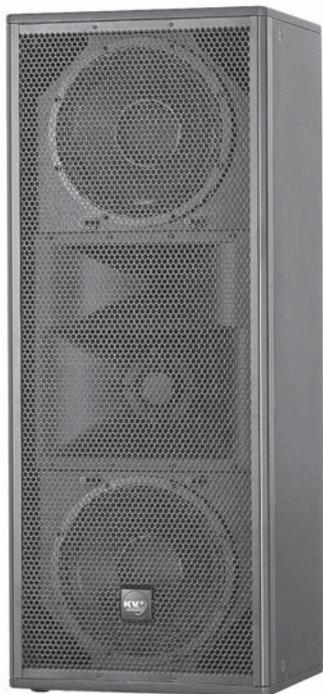
Physical Dimensions	
Height	177.8mm (7.0"), 4RU
Width	483mm (19.0")
Depth	495mm (19.5")
Weight	36kg (79.37lbs)

ESR2800 block diagram

Channel A, channel B is identical



ESR212 FULL RANGE MODULE



ESR212
The Ultimate Full Range System
part num. *KVV 987 247*

Description

The ESR212 is a dedicated Full Range System. Incorporating Patent Pending-Proprietary components, specifically matched to bespoke electronics. Exceptionally flat frequency response and Very High Definition sound system. Emphasizes every detail and nuance of a performance and transfers the atmosphere to each and every audience member.

ESR212 Applications

- Very high quality fixed installations
- Professional portable PA Systems for large format AV, speech and multimedia playback
- Live music applications
- Professional DJ loudspeaker systems
- Classical music amplification and reproduction
- Audiophile, very high quality system
- High quality studio monitoring

ESR Full Range Sound System Benefits

Total flexibility

ESR Series does not require a large number of speakers. Provides a full range, very high quality sound from single, small, location. For extended bass use from a wide range of subwoofers. Subwoofers can be placed in a large place range, because of 70Hz crossover point between ESR module and subwoofer.

Superb sound

Greater dynamic range than any current active design. Features Very High Definition technology with Super Analog amplifier.

Easy set-up

Plug-and-play connection to ESR2800 amp/processor module. Cabinet features top handles, seven suspension points and "integral feet" for easy positioning on stage.

Requires ESR2800 unit for control electronics and amplification.



- | | |
|---------------------|--------------------|
| <i>ESR2800-250V</i> | <i>KVV 987 285</i> |
| <i>ESR2800-230V</i> | <i>KVV 987 283</i> |
| <i>ESR2800-115V</i> | <i>KVV 987 284</i> |

Features

- High-output, full-range 3-way loudspeaker system
- 128dB sustained output
- Wide dispersion at high frequencies, controlled at low-mids to reduce indoor reflections
- Mid/High horn design provides optimized transducer loading and controlled dispersion
- Patent-Pending 1.75" diaphragm nitride-titanium compression driver with complex geometry phase plug for higher output and lower distortion performance and neodymium
- Six-inch midrange driver with 1.75" (44mm) neodymium magnetic motor structure for increased control and output and decreased distortion and weight
- Proprietary midrange heat dissipation system controls voice coil temperature, ensures high dynamics and extends transducer lifespan
- Front-loaded, twelve-inch mid-bass driver with 3.00" (76mm) voice coil assembly and neodymium magnetic motor structure
- Professional, exterior-grade Baltic birch construction with wear-resistant polymer coating. Proprietary corner and side handle designs for simplified handling and carrying
- Acetal copolymer high impact, low friction feet are asymmetrically located on three sides allowing vertical or horizontal system set up, lock-in and easy cabinet movement
- Six internal corner and one back brace with M10 suspension points. A total of 15 suspension points are available for custom installation applications
- Requires ESR2800 unit for control electronics and amplification

The ESR212 is a 3-way high output, active-driven, full range Loudspeaker module. It is designed as part of a sound reinforcement speaker system that includes the ESR2800 system control and amplification system.

The ESR212 Loudspeaker system benefits from being designed exclusively to operate above 40 Hz. By optimizing the ideal operating band pass of each system component, the ESR212 can achieve extremely high output levels consistently and safely.

Active-driven by the ESR2800 unit

Power, electronic crossovers, phase alignment, equalization, time correction and speaker protection are provided within the ESR2800 unit.

This "one plug in, one-plug-out" system ensures fast, easy set up and complete control. It gives you the benefits of active sound reinforcement technology, yet locates the electronics in an easy-access rackmount module.

Together, the ESR212 and ESR2800 unit deliver the highest dynamic range of any system currently available, providing new levels of clarity, depth and resolution.

Advanced compression driver

KV2 Audio's transducer partner, 18 Sound in Cavriago, Italy, manufactures and co-develops all ESR212 components. The compression driver is a 1.75-inch nitride-titanium diaphragm design, featuring a complex geometry phase plug that dramatically lowers distortion, eliminates ring modes and provides clearer, ripple free performance.

Exclusive KV2 rotatable horn design for maximum flexibility

The ESR212 features a mid/high integrated horn design with a number of unique features. First, the horn can be rotated 90°, allowing for complete flexibility in selection of vertical, horizontal system set up. The horn design is based on constant-directivity geometry with an emphasis on maintaining low transducer compression ratios, high output and wide dispersion (90° x 40°). The midrange speaker is fixed to a large aluminum heat sink which is attached to a precisely designed midrange "chamber". The combination provides optimal cone loading and heat dissipation. Further loading and dispersion is controlled through a 2.28" (58mm) precision phase plug.

Heat-resistant midrange

Midrange frequencies between 500Hz and 2.5kHz are reproduced by a six-inch midrange speaker that provides 106 dB of sensitivity (1 watt / 1 meter) when coupled with the integrated horn. The magnetic motor assembly features a high temperature 1.75" (44mm) diameter voice coil assembly and extensive use of neodymium. Because of the limited linear movement of most midrange transducers - usually 2-3mm - ventilation of the voice coil assembly and magnetic structure is poor and failure rate from heat fatigue is high. The ESR212 midrange dissipates heat passively through the use of a massive aluminum heat sink. When combined with the ESR2800 unit control electronics, the system provides high output levels safely and consistently over infinite periods of time and dramatically reducing heat associated transducer problems such as power compression and decreased dynamics.

Neodymium bass transducer

The ESR212 features a twelve-inch neodymium bass speaker with front loaded bass reflex design. It is important to note that neodymium is not a transducer panacea, as it cannot safely operate at the same typical operating temperatures ferrite does. Using neodymium requires a profound understanding of material science and finite element analysis to properly design a stable, high force magnetic structure that functions correctly. 18 Sound and KV2 audio engineering jointly designed the twelve-inch mid bass driver for the ESR212.

The ESR212 bass transducer reproduces frequencies from 38Hz to 500Hz. The bass transducer is very precise and fast with high sensitivity. The high efficiency neodymium motor provides an extraordinary amount of force that delivers complete control of the cone mass and a high overall weight loss.

Easy to set up

The ESR212 is an aesthetically pleasing - looking enclosure featuring a number of ergonomically designed components that make it a light, small, and easy speaker to set up and use.

ESR212 features the two top handles for pick up and reposition.

There are six industrial grade, internal braces placed at each corner and one internal brace on the back. Corner braces are held in place by two M10 bolts, the back brace is held by two M6 and one M10, providing a wide range of installation and suspension flexibility.



ESR212 rear panel (cable connection to ESR2800 unit Amplifier/Controller)

System Acoustic Performance

Max SPL Long-term	128dB
Max SPL Peak	131dB
-3dB Response	38Hz ÷ 22kHz
-10dB Response	28Hz ÷ 28kHz
Crossover Point	500Hz, 2.5kHz

High Frequency Section

Acoustic Design	Horn Loaded
High Horn Coverage Horizontal / Vertical	90° x 40°
Rotatable Horn	YES
Sensitivity	109dB
High Frequency Amplifier Requirement	100W from ESR2800 Amplifier
Throat Exit Diameter / Diaphragm Size	1" / 1.75"
Diaphragm Material	NVPD Treated Titanium
Magnet Type	Neodymium

Mid Range Section

Acoustic Design	Horn Loaded
Mid Horn Coverage Horizontal / Vertical	90° x 40°
Rotatable Horn	YES
Sensitivity	106dB
Midrange Amplifier Requirement	200W from ESR2800 Amplifier
Woofers Size / Voice Coil Diameter / Design	6" / 1.75"
Diaphragm Material	Epoxy Reinforced Cellulose
Magnet Type	Neodymium

Low Frequency Section

Acoustic Design	Front Loaded, Bass Reflex
Sensitivity	98dB
Subwoofer Amplifier Requirement	1000W from ESR2800 Amplifier
Number of Drivers	2
Woofers Size / Voice Coil Diameter / Design	2 x 12" / 3" / Inside Outside
Diaphragm Material	Epoxy Reinforced Cellulose
Magnet Type	Neodymium

Speaker Input

Speaker Input	Amphenol AP-6 Male
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Speaker Output

Speaker Output	-
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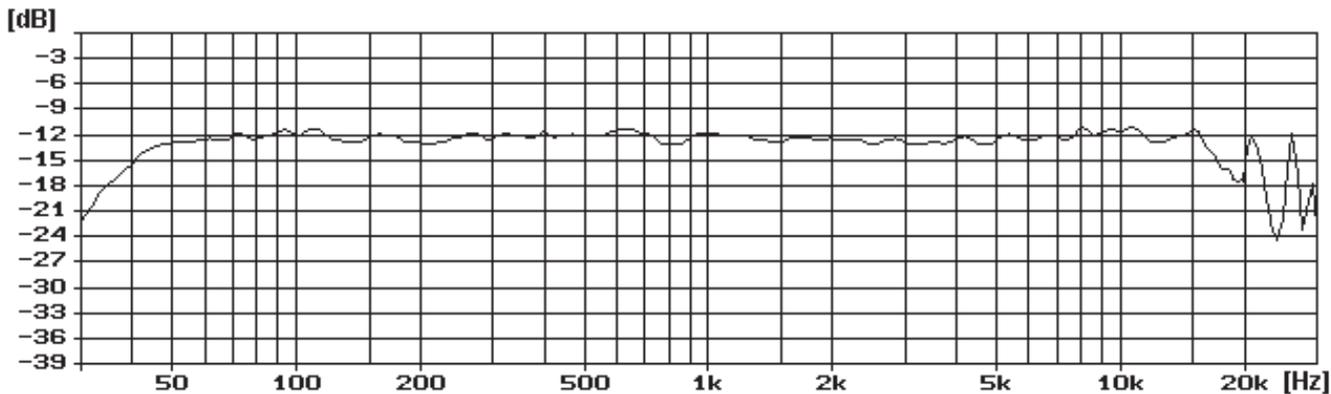
Cabinet

Cabinet Material	Baltic birch
Handles	2
Color	"Orange peeled" Matt Black or any RAL

Physical Dimensions

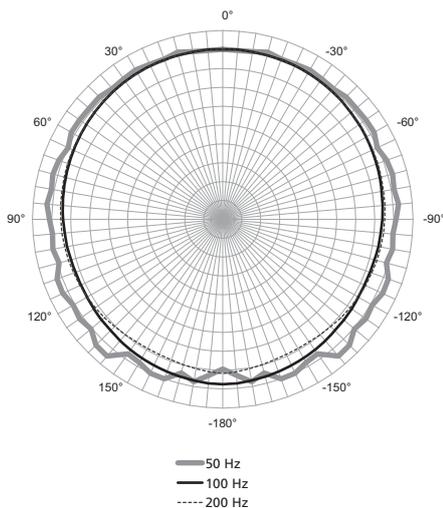
Height	1126mm (44.33")
Width	447mm (17.6")
Depth	444mm (17.48")
Weight	42kg (92.6lbs)

Frequency response

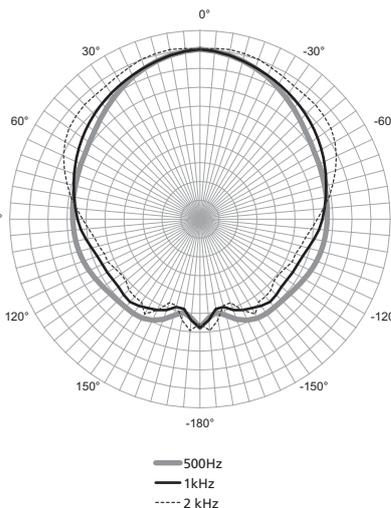


Horizontal Polarplots

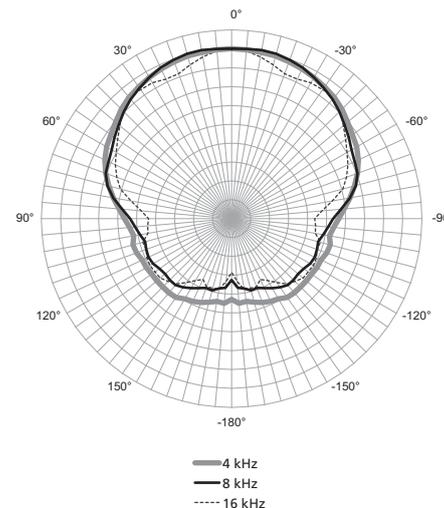
50 Hz - 200 Hz, 6 dB/div



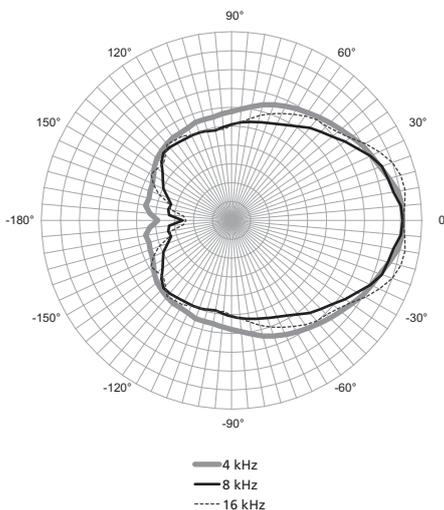
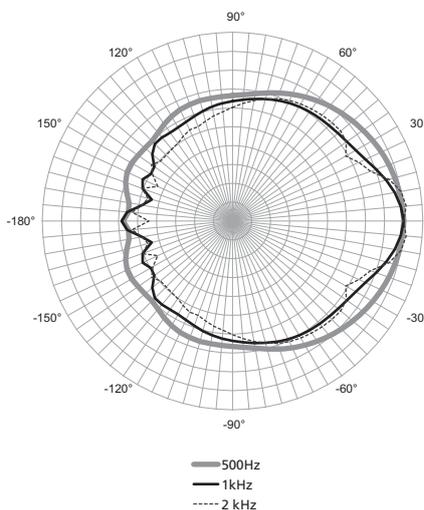
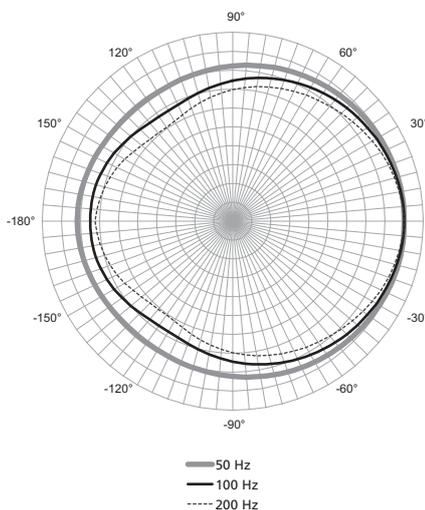
500 Hz - 2 kHz, 6 dB/div

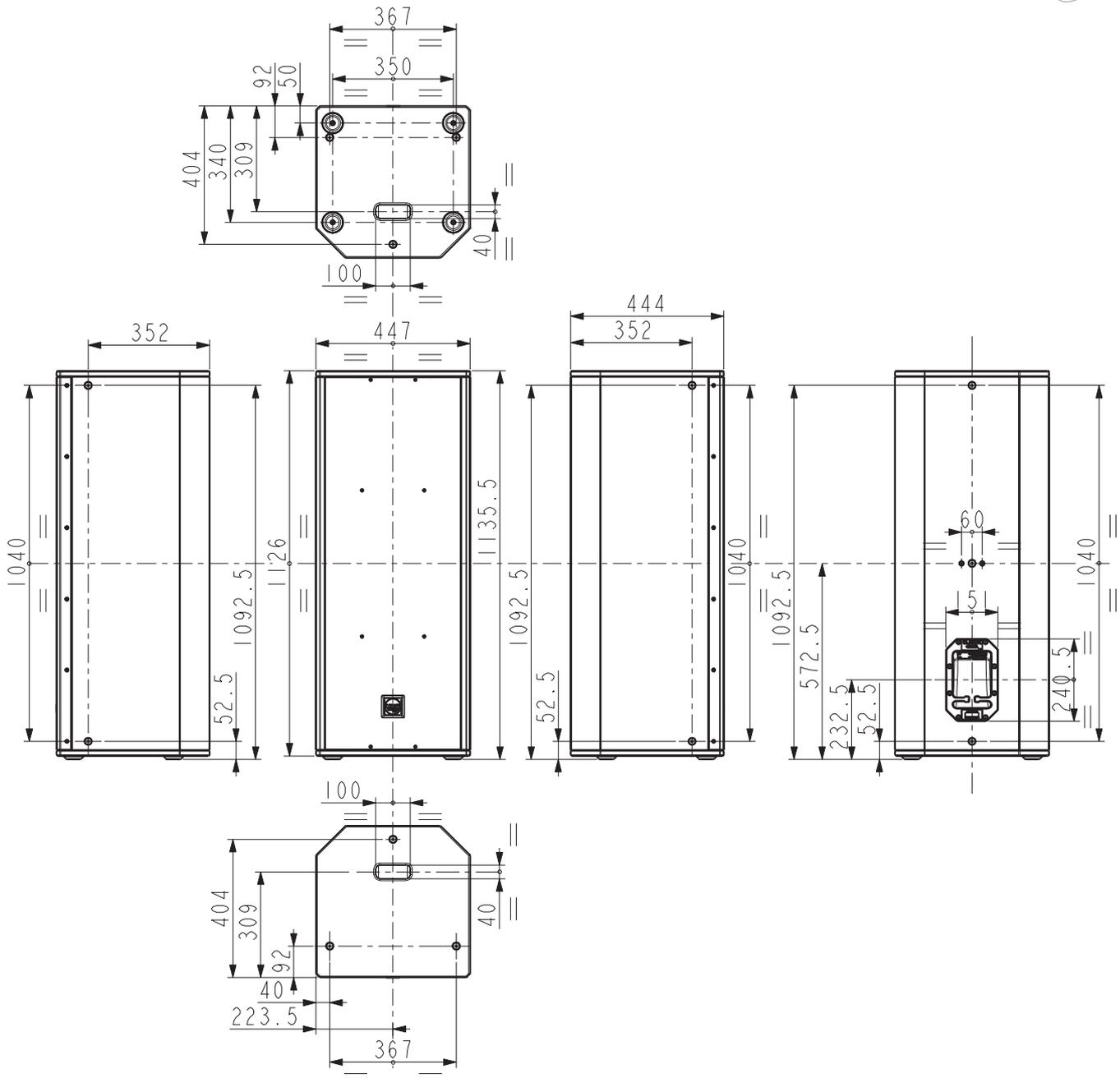


4 kHz - 16 kHz, 6 dB/div



Vertical Polarplots





ESR212 Architects and Engineer's Specifications

The three-way, mid / high loudspeaker system shall incorporate two 12-inch mid-bass (MB) transducer a 6-inch mid range (MR) speaker and a 1-inch exit compression driver high frequency (HF) transducer. The LF drivers shall be mounted above and below mid / hi horn tuned for optimum mid-bass response and dispersion. The HF and MR transducers shall be loaded on a rotatable, integrated, constant directivity mid/high horn assembly.

The system has a nominal coverage pattern of 90° (horizontal) x 40° (vertical). The loudspeaker enclosure shall have a rectangular shape and shall incorporate, two top handles. Enclosure incorporates M10 suspension points, three M10 suspension points on the top, three M10 on the bottom and one M10 suspension point on the back. The speaker cabinet shall be finished with an ultra wear resistant black polymer coating and fitted with a weather resistant perforated steel grill. The system shall receive power from a separate ESR2800 Amplifier.

ESR2800 Amplifier - Controller module consisting of separate power amplifiers for high, midrange and midbass transducers as well as signal processing including electronic band pass crossover filters, phase alignment, time correction, equalization and speaker protection. The speaker system shall connect to the Amplifier/Controller Module via proprietary cables terminated in Amphenol AP-6 connectors. The three-way mid / high loudspeaker system shall be the KV2 Audio ESR212.

<p>Vertical bracket for ESR212 part name: Vertical Bracket ESR212 part number: KVV 987 291 - 3 pcs M10x35 included</p>	
<p>Horizontal bracket for ESR212 part name: Horizontal Bracket ESR212 part number: KVV 987 304 - 2 pcs M10x30 included</p>	
<p>ES Mid/Hi speaker cable MH15, AP6 connectors - 1,5m part name: MH15 part number: KVV 987 147 - 1,5m (5ft), Mid/Hi Module hook-up</p>	
<p>ES Mid/Hi speaker cable MH60, AP6 connectors - 6m part name: MH60 part number: KVV 987 125 - 6m (20ft), Mid/Hi Module hook-up</p>	
<p>ES Mid/Hi speaker cable MH120, AP6 connectors - 12m part name: MH120 part number: KVV 987 126 - 12m (40ft), Mid/Hi Module hook-up</p>	
<p>ES Mid/Hi speaker cable MH180, AP6 connectors - 18m part name: MH180 part number: KVV 987 127 - 18m (60ft), Mid/Hi Module hook-up</p>	
<p>ES Cable kit part name: CABLE-KIT part number: KVV 987 047 The ES Cable Pack consist of four high-quality Amphenol AP cable assemblies designed for use with ES Series. - 2 pcs LF15 - 1pc LF40 - 1pc MH60</p>	
<p>Amphenol AP6 cable-mount female connector part name: AP-6-11 part number: KVV 987 050</p>	
<p>Amphenol AP6 cable-mount male connector part name: AP-6-12 part number: KVV 987 051</p>	

The future of sound. Made perfectly clear.

At KV2 Audio our vision is to constantly develop technologies that eliminate distortion and loss of information providing a true dynamic representation of the source.

Our aim is to create audio products that absorb you, place you within the performance and deliver a listening experience beyond expectation.



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