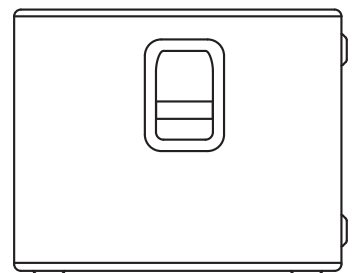
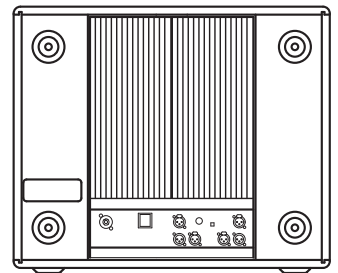
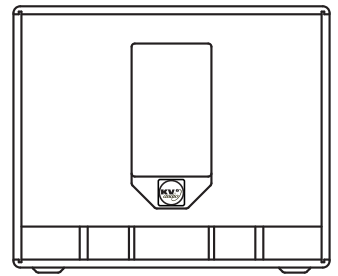
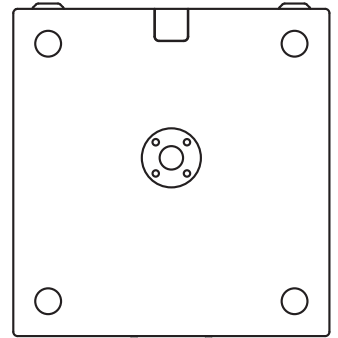




EX2.2 User Guide



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.

CONTENTS

USER'S GUIDE	1
CONTENTS	2
INTRODUCTION	3
HOW TO USE THIS MANUAL	3
Icons used include	3
Introducing the EX2.2	3
Electronics	3
Acoustic Components	4
Enclosure Design	4
APPLICATIONS	4
AC POWER REQUIREMENTS	4
AC POWER	4
Voltage Requirements	4
The Power Connector	5
Current Requirements	5
AC Cable Color Coding	5
IMPORTANT SAFETY INSTRUCTIONS	6
SAFETY SUMMARY	6
EX2.2 CONTROL PANEL	7
REAR CONTROL PANEL	7
Audio Input and Output	7
Amplifiers and Acoustic Filters	8
LED Status Lights	8
Power On / Thermal LED	8
Signal	8
Limiter	8
Phase Switch	8
Level Control	8
EX2.2 DRAWING	9
EX2.2 SPECIFICATIONS	10
EX2.2 ACCESSORIES	11

INTRODUCTION

HOW TO USE THIS MANUAL

As you read this manual, you'll find figures and diagrams to help you understand and visualize what you're reading. You'll also find numerous icons that serve as cues to flag important information or warn you against improper or potentially harmful activities.

Icons used include:



"NOTE" identifies an important or useful piece of information relating to the topic under discussion.



"TIP" offers a helpful tip relevant to the topic at hand.



"CAUTION" gives notice that an action can have serious consequences and could cause harm to equipment or personnel, delays, or other problems.



Introducing the EX2.2

The EX2.2 is a high output, active subwoofer system. Through the use of proprietary amplifier technology, a precision manufactured state of the art woofer component and the innovative implementation of a high efficiency, twin chamber acoustic design, the EX2.2 delivers tight, fast, controlled bass response at very high output levels. This system falls directly out of KV2 Audio's philosophy to develop products with increased dynamic range, very high output and a consistent sound character no matter what the output level.

The system establishes new performance standards for an active powered subwoofer that can only be achieved through the integration of new amplifier topologies, transducer designs and electronic control technologies that are closely tied to a passion for taking performance to the next level.

The EX2.2 can be used in a variety of system applications. It can add high performance bass reproduction to active speaker systems such as KV2 Audio's EX12 loudspeaker, or it can be easily used with passive speaker systems. The built in electronic high pass filter, phase and independent output level controls provide high precision, easy to use system integration circuitry.

Electronics

Amplifier power, electronic crossovers, equalization and speaker protection are integrated into the EX2.2's amplifier module. On-board electronics ensures fast, easy set up and complete control making it easy to set up and provides long-term reliability. An improved version of KV2 Audio's switch mode, current enhancing low frequency amplifier has been specially developed for the EX2.2. The new design improves overall system efficiency to over 90% and delivers 1000 watts of continuous power.

KV2 Audio has developed an amplifier topology that possesses two unique characteristics that are critically important for high performance, active subwoofer systems. The EX2.2 amplifier topology delivers very high efficiency and generates minimal thermal losses allowing the amplifier to deliver extremely high power levels reliably whilst employing a simple cooling system.

Secondly, in order to reproduce low frequency information with high transient content and extend the operational boundaries of the acoustic design, the amplifier needs to deliver an extraordinary amount of current in order to keep the woofer's high mass under control. This is especially true under typical "phase shift" conditions, in which the amount of the current requirement is sometimes doubled. Through the implementation of a proprietary, switch mode amplifier technology, the EX2.2 amplifier provides extremely high efficiency with low losses and delivers the highest woofer control by delivering higher current levels under "phase shift" conditions.

The amplifier module is fitted onto a large format, finned, aluminum alloy heat sink providing high flow, passive cooling and eliminating standard maintenance cycles associated with forced cooled amplifier designs. The entire mechanical assembly is fitted on a mechanical suspension system that isolates low frequency energy and ensures long-term reliability.

AC POWER REQUIREMENTS

Acoustic Components

The EX2.2's woofer technology is based around high efficiency, high power woofer designs. The device features: high temperature polyimide voice coil assemblies that undergo multiple baking and curing processes as well as advanced magnetic structures with complex cooling systems. The woofer cones have been specially developed to withstand the demanding environment created by the high acoustic loading inside the EX2.2 chambers. The EX2.2 was designed using new concepts in twin asymmetrical acoustic chambers that deliver very high speaker loading and output from a relatively small cabinet footprint. It is ideal for use in live applications that require reproduction of low frequencies with very high transient content at high output levels.

Enclosure Design

There are two industrial grade, internal braces placed at the top of the cabinet. Each brace is held in place by four M8 bolt and feature two M10 hang points providing a wide range of installation and suspension flexibility. There is also a pole mount "top hat" located on the top side of the cabinet.

APPLICATIONS

- Live and Playback Applications
- Portable PA Systems
- Corporate Events
- Fixed Installations

AC POWER

The EX2.2 is an advanced self-powered loudspeaker system with on-board amplification and control systems. Understanding power distribution, voltage and current requirements, as well as electrical safety issues, is critical to the safe operation of the EX 2.2.

The EX2.2 uses a PowerCon 3-pole AC main system with locking connectors to prevent accidental disconnection. The main AC connector (blue) serves as the power input.

The EX2.2 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.

Voltage Requirements

The EX2.2 operates safely and without audio discontinuity if the AC voltage stays within the operating window of 100V-120V in 115V mode, 205V-240V in 230V mode and 225V-260V when working in 250V mode, at 50 or 60Hz.



CAUTION: If the On LED does not illuminate or the system does not respond to audio input, remove AC power immediately. Verify that the voltage is within the proper range. If the problem persists, please contact KV2 Audio or an authorized service center.

If the voltage drops below the low boundary of its safe operating range, the loudspeaker will shut down if the voltage does not rise above the low boundary before storage circuits are depleted. How long the loudspeaker will continue to function during brownout depends on the amount of voltage drop and the audio source level during the drop.

If the voltage increases above the upper boundary of the range, the power supply can be damaged.



NOTE: It is recommended that the voltage supply be within the rated voltage window. This ensures that AC voltage variations from the service entry-or peak voltage drops due to cable runs-do not cause the amplifier to cycle on and off or cause damage to the power supply.



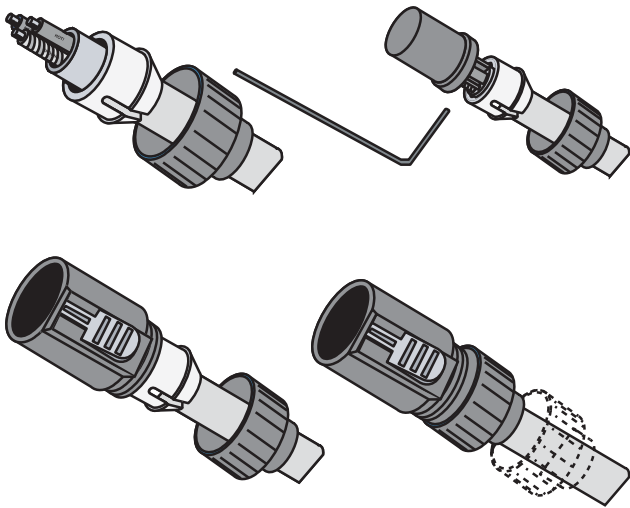
NOTE: For best performance, the AC cable voltage drop should not exceed 10 volts, or 10 percent at 115 volts and 5 percent at 230 or 250 volts..

AC POWER REQUIREMENTS

Make sure that even with the AC voltage drop, the AC voltage always stays within recommended operating ranges. The minimum electrical service amperage required by a EX2.2 speaker system is the sum of each loudspeaker's maximum continuous rms current. An additional 50 percent above the minimum amperage is recommended to prevent peak volt-age drops at the service entry.

The Power Connector

The EX2.2 requires a grounded outlet. It is very important that the loudspeaker AC supply be properly grounded in order to operate safely and correctly. Use the PowerCon AC cable-wiring diagrams to create international or special-purpose power connectors:



Power connector assembly

Current Requirements

Each EX2.2 requires approximately 10 Amps max at 115V AC for proper operation. This allows one EX2.2 to be powered from one 15 A breaker at 115 V and up to 2 subwoofers at 230 or 250 V.

The EX2.2 presents a dynamic load to the AC mains, which causes the amount of current to fluctuate depending on quiet or loud operating levels. Since different cables and circuit breakers heat up at varying rates, it is essential to understand the types of current ratings and how they correspond to circuit breaker and cable specifications.

The maximum long-term continuous current consumption is the maximum rms current during a period of at least ten seconds. It is used to calculate the temperature rise in cables, in order to select a cable size and gauge that conforms to electrical code standards. It is also used to select the rating for slow-reacting thermal breakers.

The burst current consumption is the maximum rms current during a period of approximately one second, used to select the rating of most magnetic breakers and to calculate the peak voltage drop in long AC cables according to the formula: $V_{pk}(\text{drop}) = I_{pk} \times R$ (cable total).

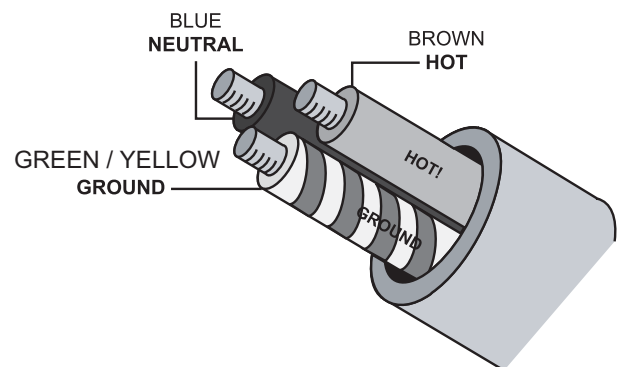
The ultimate short-term peak current is used to select the rating of fast reacting magnetic breakers. Use the table below as a guide when selecting cable gauge size and circuit breaker ratings for your operating voltage.

Current Draw	115V Mode	230V, 250V
Max. Long Term Continuous	10 A rms	5 A rms
Burst Current	15 A rms	10 A rms
Short Term Peak	40 A peak	20 A peak

AC Cable Color Coding

If the colors referred to in the diagram don't correspond to the terminals in your plug, use the following guidelines:

Connect the blue wire to the terminal marked with a N or colored black. Connect the brown wire to the terminal marked with an L or colored red. Connect the green and yellow wire to the terminal marked with an E or colored green or green and yellow.




Power cable color coding



CAUTION: The EX2.2 requires a ground connection. Always use a grounded outlet and plug.

AC POWER REQUIREMENTS

IMPORTANT SAFETY INSTRUCTIONS

1. Read all product instructions.
 2. Keep printed instructions, do not throw away.
 3. Respect and review all warnings.
 4. Follow all instructions.
 5. Do not use this loudspeaker near water, in unprotected outdoor areas or in rain or wet conditions.
 6. Clean only with dry cloth.
 7. Do not block any ventilation openings.
 8. Install in accordance with KV2 Audio recommended installation instructions.
 9. Do not install near any heat sources such as heat radiators, heat registers, stoves, or other apparatus that produce heat.
 10. Do not defeat the safety purpose of the grounding type plug. A grounding type plug has two blades and a third grounding connector. The third connector is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
 11. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the loudspeaker. The AC mains plug or appliance coupler shall remain readily accessible for operation.
 12. Only use accessories specified by KV2 Audio.
 13. Install the product only with rigging specified by KV2 Audio, or sold with the loudspeaker.
-
-  **CAUTION:** Rigging should only be done by experienced professionals.
-
14. Unplug this loudspeaker during lightning storms or when unused for long periods of time.
 15. Refer all servicing to qualified service personnel. Servicing is required when the loudspeaker has been damaged in any way, such as when the power-supply cord or plug has been damaged; liquid has been spilled or objects have fallen into the loudspeaker; rain or moisture has entered the loudspeaker; the loudspeaker has been dropped; or when for undetermined reasons the loudspeaker does not operate normally.

SAFETY SUMMARY

To reduce the risk of electric shock, disconnect the loudspeaker from the AC mains before installing audio cable. Reconnect the power cord only after making all signal connections. Connect the loudspeaker to a twopole, three-wire grounding mains receptacle. 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 loudspeaker. Do not put objects containing liquid on or near the unit. To reduce the risk of overheating the loudspeaker, avoid exposing it to direct sunlight. Do not install the unit near heat-emitting appliances, such as a room heater or stove. This loudspeaker 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.

EX2.2 CONTROL PANEL

REAR CONTROL PANEL

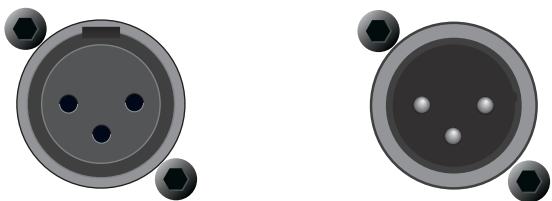
The EX2.2 features an easy to use rear control panel featuring audio input and output connections, level control, LED status lights and a low pass filter that can be engaged when the loudspeaker is used as a stage monitoring device.

Audio Input and Output

The EX2.2 uses balanced, female XLR connectors for audio signal input, and a male XLR connector to provide through output signal. The EX2.2 features Left and Right stereo inputs and outputs allowing the product to be integrated into stereo systems that require one subwoofer.

The EX2.2 also features Left and Right High Pass Outputs that can be used to provide audio signal to full range speakers being used in conjunction with the EX2.2. The high pass filter provides a crossover point of 125Hz.

The through output connector, wired in parallel to the audio input, will continue to provide the input signal if the EX2.2 is turned off. The audio input circuit presents a 20 kOhm balanced input impedance to a three-pin XLR connector with the following connectors:



Main input

Through output

Pin 1 - Ground

Pin 2 - Signal (+)

Pin 3 - Signal (-)

Case - Earth (AC) ground and chassis

Audio signal can be daisy-chained using the through output connector on the input panel. A single source can drive multiple EX2.2 subwoofers with a paralleled input loop. If you are driving multiple EX2.2's in an array, make certain that the source device can drive the total load impedance presented by the paralleled input circuit of the array.



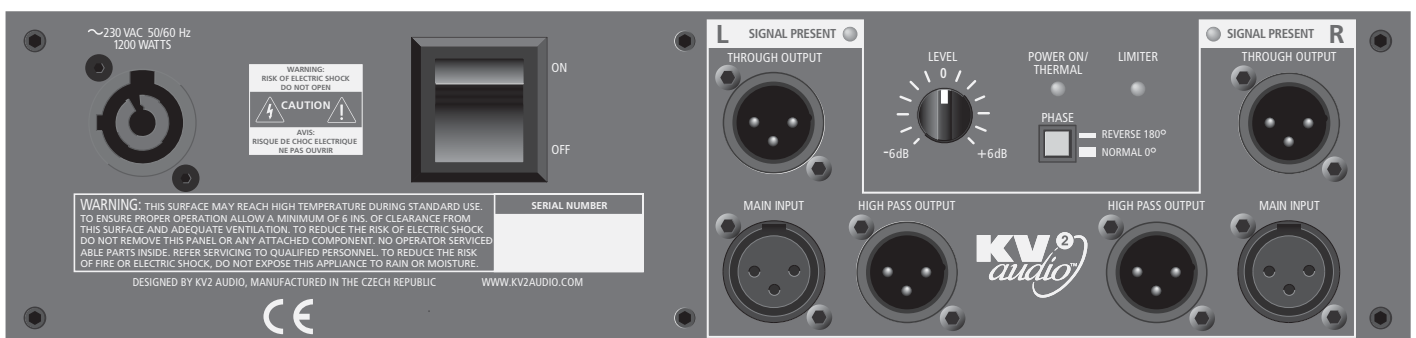
NOTE: Most source equipment is safe for driving loads no smaller than 10 times the source's output impedance. For example, cascading an array of 10 units consisting of EX2.2 subwoofers produces an input impedance of 2000 ohms (20kOhms divided by 10). The source equipment should have output impedance of 200 ohms or less. This is also true when connecting EX2.2's in parallel (loop out) with other KV2 Audio amplifiers, active speakers and subwoofers.



TIP: If the loudspeaker produces noises such as hiss and popping, disconnect the audio cable from the loudspeaker, if the noise stops, then most likely the problem is not with the loudspeaker. Check the audio cable, source, and AC power for the source of the problem.



NOTE: Ensure that all **cabling** carrying signal to multiple amplifiers and active speaker systems is **wired correctly**. Make sure that the **polarity** has not been reversed. Reversed polarity can cause severe degradation in frequency response and can also impact the dispersion characteristics of the speaker.



EX2.2 Rear panel

EX2.2 CONTROL PANEL

Amplifiers and Acoustic Filters

A power amplifier specifically designed and optimized for the low frequency woofer powers the EX2.2. The control system in the EX2.2 processes the audio signal through a series of electronic filters and circuits providing equalization, crossover filters, thermal and overdrive protection.

LED Status Lights

The EX2.2 control panel uses three distinct LED's to provide operating status information.

Power On / Thermal LED

This LED turns green when the speaker is turned ON. The light will continue to be green during normal operation of the speaker system. The LED will change from green to yellow under a thermal condition resulting from overheating of the amplifier system. Under this condition, the speaker system will shut down. You can expect for the system to be down for at least 2-3 minutes depending the ambient temperature and whether the system is being exposed to direct sun light.

Signal

There are individual LED's for each the Left and Right signal inputs. The LED turns green when there is audio signal present in the EX2.2. This signal indicator can be used to troubleshoot wiring problems.

Limiter

Should the rms limiting system be engaged due to overdriving of the EX2.2, the LED will light up yellow. The audible effect of the rms limiter is a lowering of overall output level. The rms limiter will disengage only if the input level is turned down.



NOTE: Please contact KV2 Audio or a local service representative should the system enter a thermal condition under normal operating conditions.

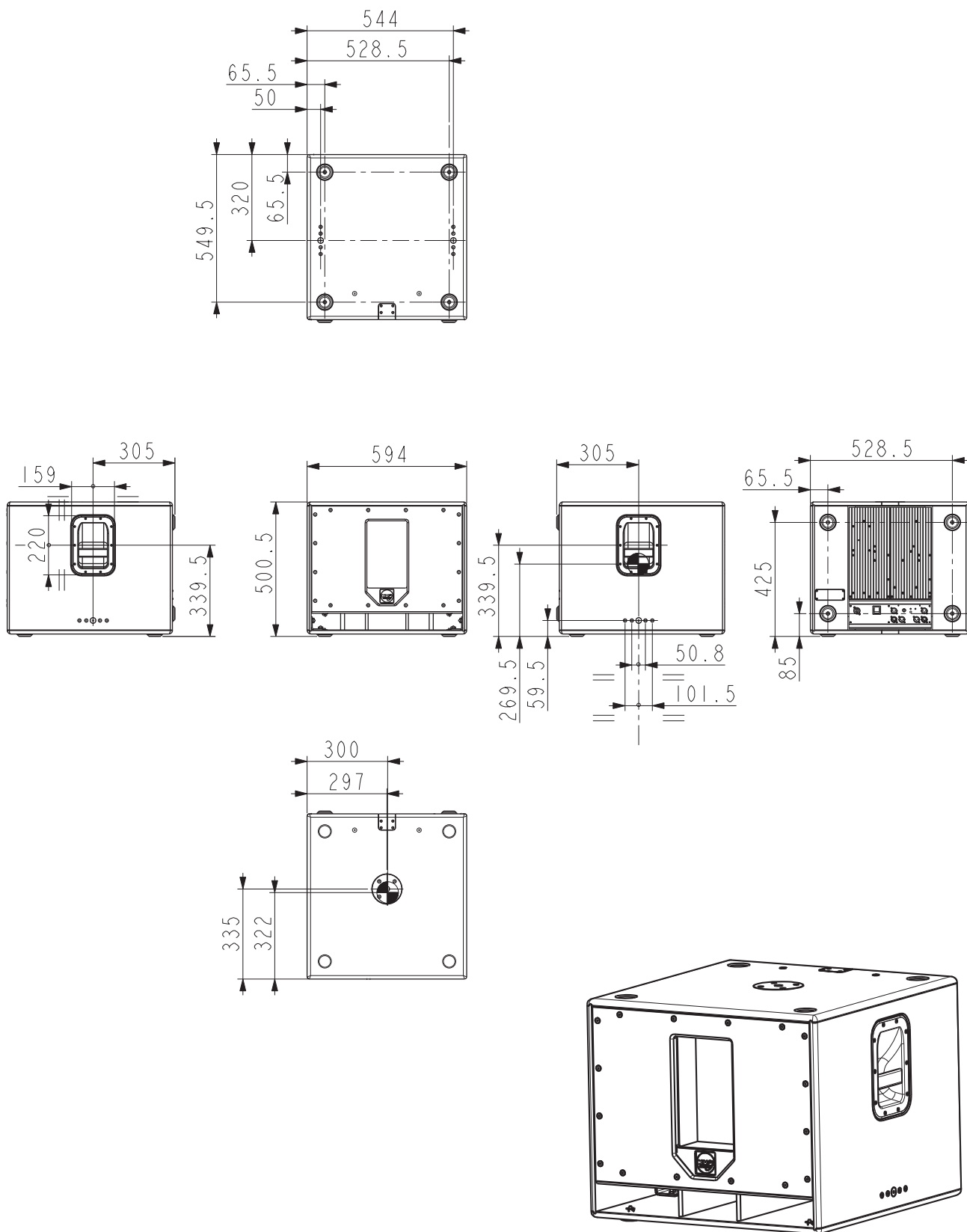
Phase Switch

The EX2.2 features a phase switch that changes the phase of the high pass audio output signal. Changing the phase of the output signal serves as a tool for integrating the full range cabinet and the subwoofer into challenging audio environments. We recommend using a suitable measuring device for performing relevant measurements and determining whether the phase should be reversed.

Level Control

The EX2.2 features a rotary control knob providing adjustment of the audio level. The operational range of the control is -6dB to +6dB.

EX2.2 DRAWING



EX2.2 SPECIFICATIONS

Product Number

KVV 987 135 - **EX2.2 250V**

KVV 987 013 - **EX2.2 230V**

KVV 987 014 - **EX2.2 115V**

System Acoustic Performance

Max SPL Long-term	130dB
Max SPL Peak	133dB
-3dB Response	45Hz ÷ 125Hz
-10dB Response	40Hz ÷ 125Hz
Crossover Point	125Hz

Low Frequency Section

Acoustic Design	<i>Twin Asymmetrical loading</i>
Number of Drivers	2
Woofer Size / Voice Coil Diameter / Design	12" / 3" / <i>Inside outside</i>
Diaphragm Material	<i>Epoxy Reinforced Cellulose</i>
Magnet Type	<i>Neodymium</i>

Low Frequency Amplifier Specification

Type	<i>High efficiency, Current-enhancing switch mode</i>
Rated Continuous Power	1000W
Distortion	<0.05%
Operating Bandwidth	40Hz ÷ 125Hz
Signal Input	
Input Channels	2
Input Sensitivity	1.0V RMS
Input Impedance	20kΩ (<i>balanced</i>)

Signal Output

Output channels	<i>Mid/High, Through</i>
-----------------	--------------------------

Features

Level Control	-6 - +6dB
Phase	0° / 180°
RMS Limiter	YES

Power

Power Connector	<i>Neutrik PowerCon®</i>
Operating Voltage	115V / 230V / 250V
Operating Voltage Range	100 ÷ 120V@60Hz 205 ÷ 240V@50Hz 225 ÷ 260V@50Hz
Recommended Amperage	10A 115V 5A 230V 5A 250V
Cooling	<i>Passive</i>

Cabinet

Cabinet Material	<i>Baltic birch</i>
Handles	2
Pole Mount	M20
Color	<i>"Orange peeled" Matt Black or any RAL</i>

Physical Dimensions

Height	491mm (19.33")
Width	596mm (23.46")
Depth	616mm (24.25")
Weight	49kg (107.8lbs)

EX2.2 ACCESSORIES

Heavy duty cover for EX2.2 used without cart

part name: COVER EX2.2
part number: KVV 987 072



Heavy duty cover for EX2.2 used with cart CRT-0004

part name: COVER EX2.2 WITH CART
part number: KVV 987 133



Heavy duty telescopic speaker pole for ES/EX series

part name: KV2-H
part number: KVV 987 130



Front mount magnetic cart for EX1.8

part name: CRT - 0011
part number: KVV 987 230
- wheels not included



Cart Wheels with bolts nuts kit

part name: CRT - WHL
part number: WHL - KVV 987 031
- 4 pcs in pack (rotating), (blue)



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.



KV2 Audio, Nádražní 936, 399 01 Milevsko, Czech Republic
T +44(0)1423 816868 F +44(0)1423 816869
www.kv2audio.com