VHD7000D

User Guide

Important Safety Instructions

Before using your VHD7000D Amplifier, be sure to carefully read the applicable items of these operating instructions and the safety suggestions.

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 unit near water, in unprotected out door 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's 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 connector plugs and receptacles. The AC mains plug or appliance coupler shall remain readily accessible for operation.
12. Only use accessories specified by KV2 Audio.
13. Unplug this Amplifier during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the Amplifier 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 Vents; rain or moisture has entered the Amplifier; the Amplifier has been dropped; or when for undetermined reasons the Amplifier does not operate normally.
15. Do not remove front or back panels. Removal of the panel will expose hazardous voltages. There are no user serviceable parts inside and removable may void the warranty.
16. An experienced user shall always supervise this professional audio equipment.

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE THE PANELS.
NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED PERSONNEL.

WARNING: To prevent fire or electric shock, do not expose this equipment to rain or moisture.

SAFETY SUMMARY

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. Connect the Amplifier to a two pole, 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 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.

Contents

VHD 7000D
VERY HIGH DEFINITION AMPLIFIER

VHD7000D - part number KVV 987 545 (230 V)

Application

Specifically designed to drive all VHD, ES and SL subwoofer elements, with high power, exceptional control and advanced setup options utilising KV2's Control and Diagnostics Tool

- Large-scale live music and playback performance
- Dance clubs and nightclubs
- Hire and production
- Fixed installation
- Easily incorporated into multiple KV2 audio system projects

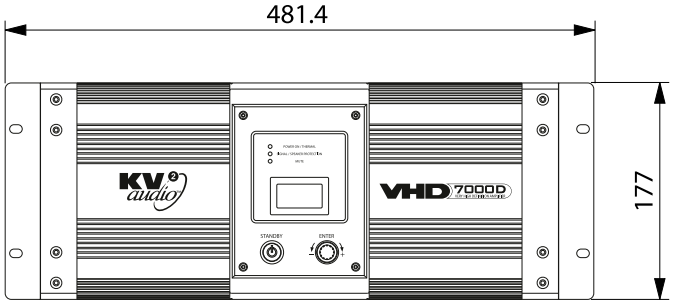
Introduction

The VHD7000D is a high powered single channel rack-mounted subwoofer amplifier. The unit contains one 3 500 W RMS long-term amplifier with a high current switching mode power supply, housed in a single 4U rack chassis. The design of its unique and innovative power management system enables the amplifier to deliver a short term power of 7 kW, with a peak power output of up to14 kW, whilst operating at a modest consumption of 3.6 kW from a 16 A circuit.
The unit incorporates an over specified energy reservoir, enabling it to deliver peak output power beyond the capacity of the mains supply, and for longer durations than other comparable subwoofer amplifiers often quoting the same output power or more. The unit acts as a standalone unit, or as a slave for other KV2 audio system and control amplifiers. The VHD7000D powers associated VHD subwoofer systems, as selected and is configurable from either the front panel, a web browser or by using KV2's Control and Diagnostics Tool. The VHD7000D is equipped with variable gain, a low-pass filter, internal delay line, a notch filter and adjustable protection settings.

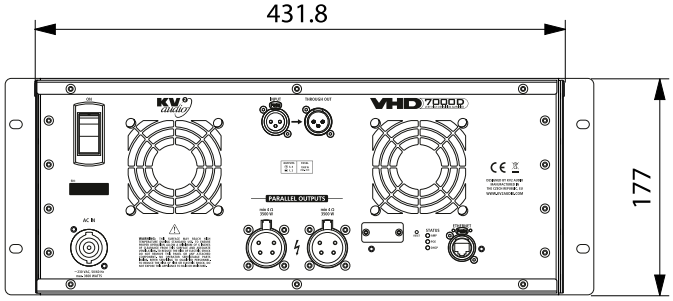
Although this unit is simple to operate improper use can be dangerous. This is a very high-powered device that can put out high voltages and sizable currents. Always use safe operating techniques with the VHD7000D.

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

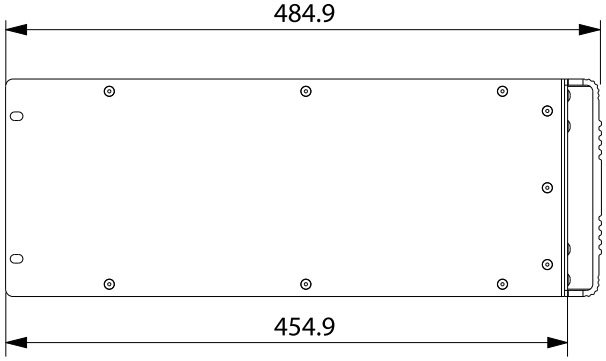
Front Panel:



Rear Panel:



Side Panel:



Unpacking

Unpack the VHD7000D and check to see if there is any damage to it. 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 VHD7000D carton should contain:

- VHD7000D amplifier control unit
- User Guide
- PowerCon 32 A detachable power cable

Rack Mounting

The VHD7000D will mount in standard 19" rack systems. The amplifier occupies 4 rack units (4RU) in height. Integral rear mounting rack ears are also provided for additional support, do not rely on fixing and mounting the VHD7000D using just the front panel as support. Use eight screws and washers to mount the amplifier to the equipment rack rails (four for the front and four for the rear). We recommend using a shock mounted rack for touring use to prolong the life of your VHD7000D.

Cooling

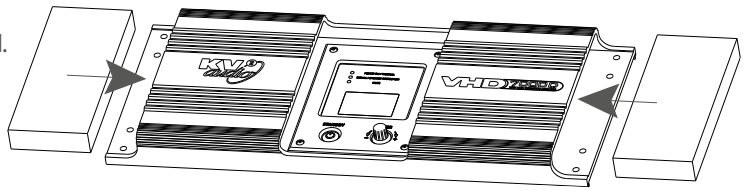
The VHD7000D has a comprehensive cooling system featuring chassis-sealed PCB board mounting and shock mounted, speed controlled fans.

Air is drawn into the front of the amplifier by the two fans on the rear panel, this passes over the cooling fins of the heat sinks and exhausts through the rear. If the amplifier becomes excessively overheated, the input signal is muted to minimize further heating of the amplifier.

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.

IMPORTANT! Please note that for correct full performance of the unit AND ANY WARRANTY COVER, it is important that regular maintenance of the front vents and filters as well as the rear panel fans be inspected and cleaned by removing any dust and debris build-up. Any product failure due to lack of attention in this matter will immediately void any current warranty.

The air filters are located in the handles of the front panel. To clean them, slide the filters sideways outwards from the center of the panel, vacuum or rinse them with water, allow them to dry, and reinstall.



AC Requirements

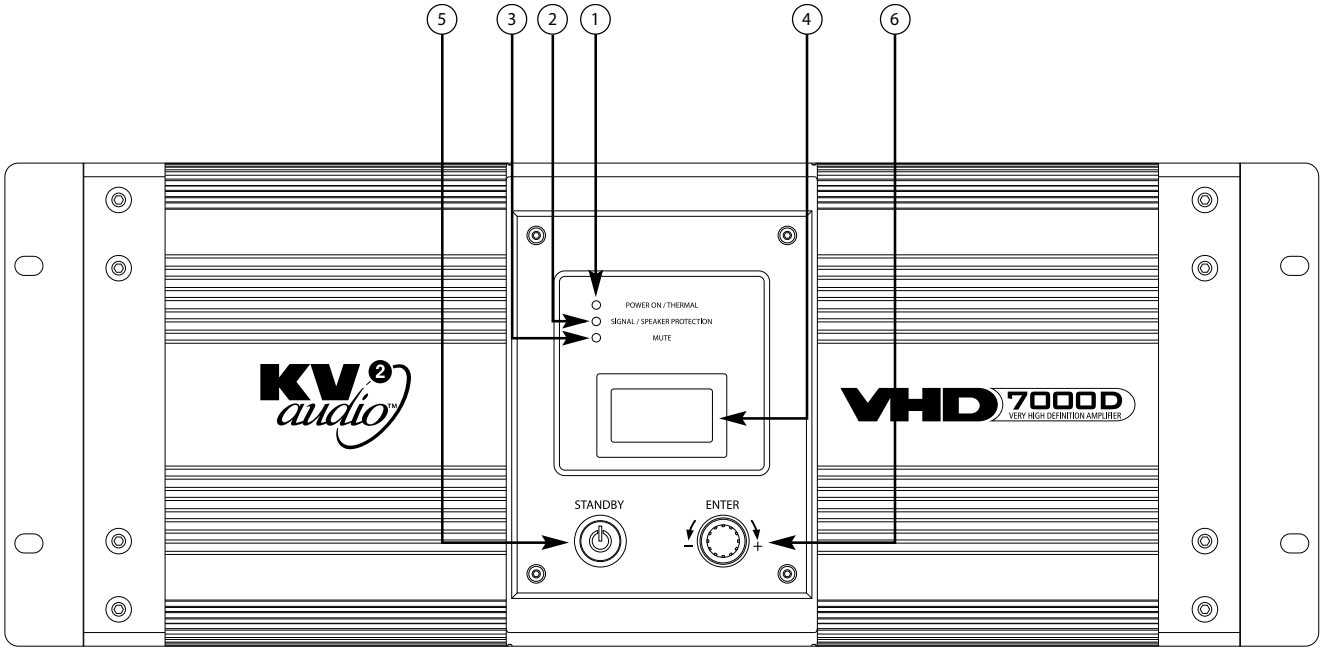
The PowerCon 32 A cable is provided to connect the VHD7000D to a suitable AC power supply.

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 VHD7000D features a switched-mode power supply set to the power limit of a 230 V/16 A distribution network. As the mains voltage drops, the current draw increases. The power supply operates within a range of 200 to 250 V; if the voltage falls below 160 V, the supply shuts down, and it will automatically restart once the mains voltage rises above 180 V. The amplifier measures the mains voltage, which is displayed on the front panel screen or remotely in the DIAGNOSTICS section. The table below provides typical current draw figures for the VHD7000D.

AC Input	Current draw with amplifier running at average power	Current draw with amplifier running at peak power
250 V	15 A	22 A
230 V	16 A	24 A
200 V	18.5 A	28 A

Front panel



1) Power ON / Thermal

These are dual colour LEDs. When green they indicate that the Power Switch is ON and the amplifier is powered up. When red they indicate that amplifier has overheated and mute. The unit will Auto Reset after it cools down to a safe operating temperature.

2) Signal / Speaker Protection

These are dual colour LEDs. When green they indicate that signal is present at the Input of the amplifier. When orange it indicates that the audio speaker protection limiter has been activated.

3) Mute

Red colour LED. When lit, it indicates an activated amplifier mute.

4) Display

Shows the set parameters and allows settings of various functions in the menu.

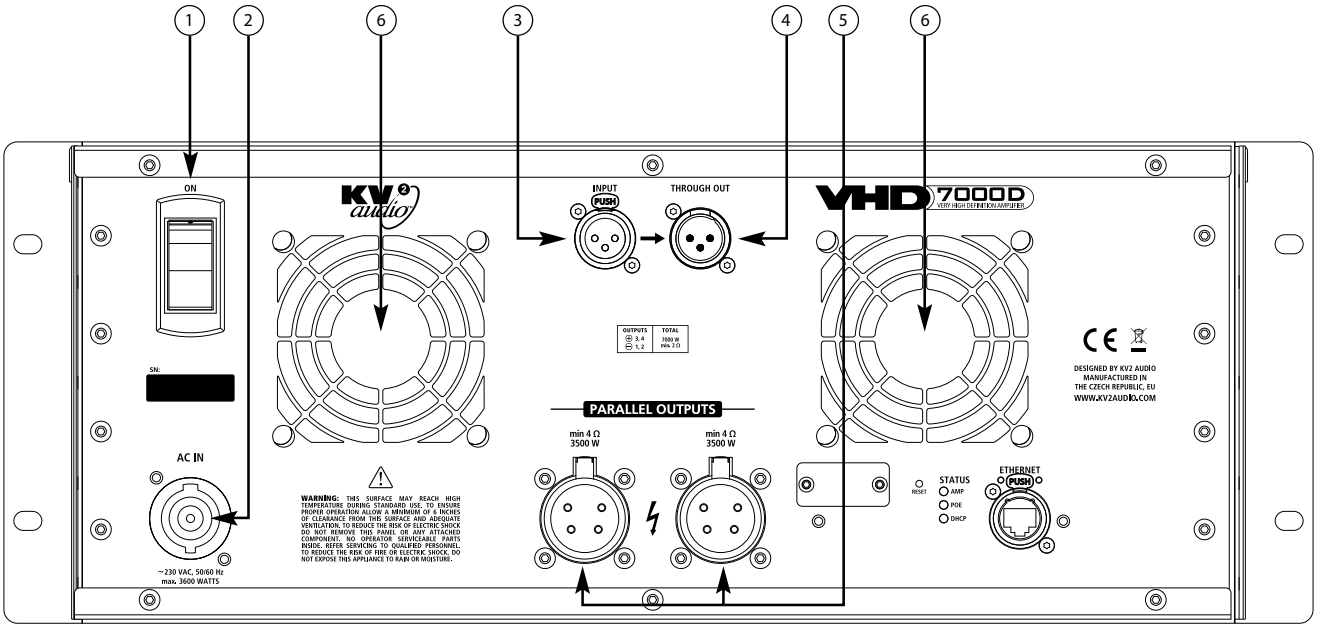
5) Standby

This illuminated pushbutton serves for standby mode. This pushbutton is green in normal power-on state and illuminates red when standby mode is activated.

6) Enter

The Rotation encoder with Enter push button. The encoder serves as the main method for increasing (clockwise), or decreasing (counterclockwise) values and menu positions. The encoder also serves as the ENTER button, allowing the operator to enter/leave the sub-menu within the main menus.

Rear panel



1) AC Mains Switch

The VHD7000D has combination AC mains switch/circuit breaker on the front panel. The circuit breaker has a nominal rating of 16 A. 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) PowerCon Power Connector

The VHD7000D Amplifier uses one AC PowerCon 32 A terminated AC Mains cable.

3) Input

This is the input female XLR connector.

4) Through out

This is the Through out male XLR connector for sending unprocessed signal to other devices, such as more VHD7000Ds.

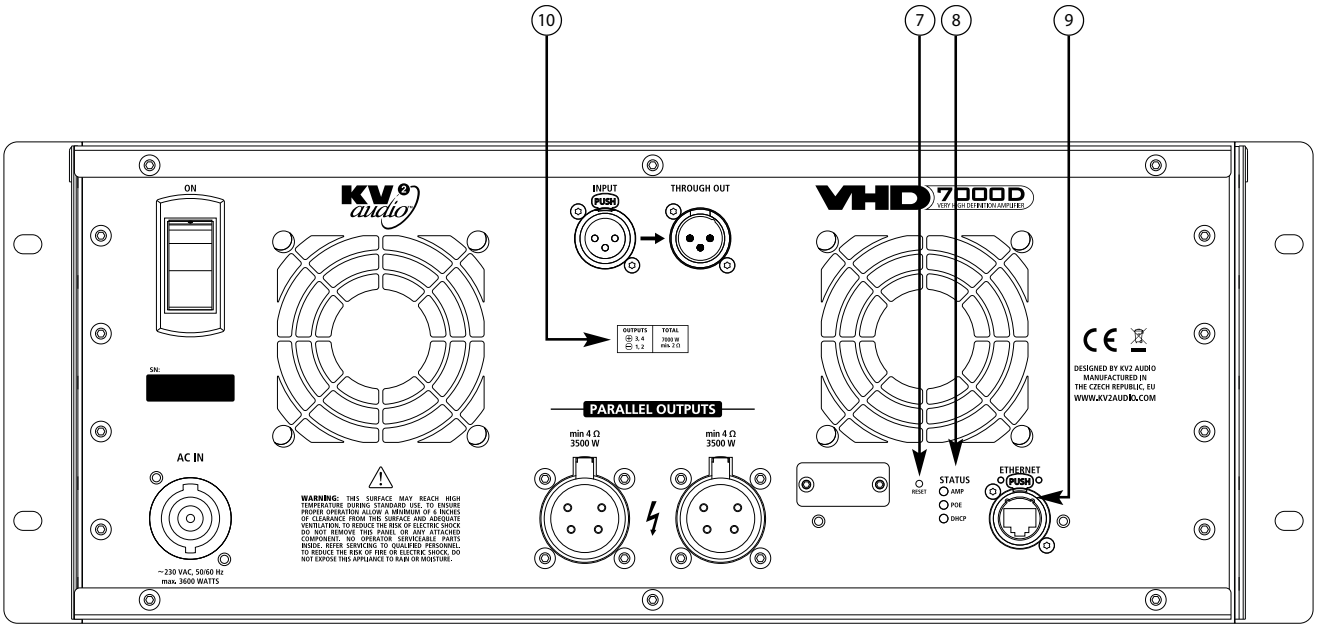
5) Speaker AP4 Connectors

Accepts standard AP4 terminated loudspeaker cables. We recommend using 2.5 mm/core cables.
The minimum recommended output load is 4 Ω per connector.

6) Fans

The cooling fans operate continuously while the VHD7000D 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 VHD7000D is mounted.

Rear panel



7) Reset

Serves as factory reset button. Resets all network settings (default settings AutoIP/DHCP). Use a tool with maximum diameter 2 mm.

8) Status

LEDs indicate amplifier and amplifier diagnostic status, these are:

AMP

Dual colour LED. When green, it indicates that the power amplifier is powered up and all monitored parameters are OK. When red, it indicates that the amplifier is off, or some problem with the amplifier occured. More information can be obtained via Ethernet.

POE

When green, it indicates that the diagnostics unit is powered via Power over Ethernet device.

DHCP

When green, it indicates that the diagnostics Ethernet IP address is assigned from the DHCP server.

9) Ethernet connector

Serves as an external communication port supporting Ethernet standard, accepts RJ45, T-658B wiring. The VHD7000D provides web-server and SNMP (Simple network management protocol). When the Ethernet cable is connected and devices successfully establish a connection, the green LED is activated. When Ethernet communication is in progress, the orange LED flashes.

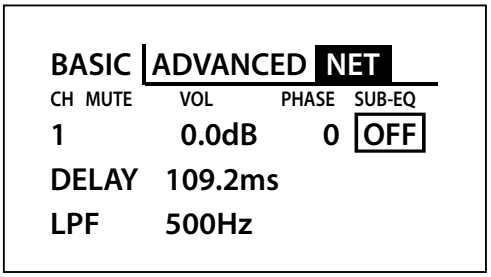
10) Wiring

This table contains information about the output AP4 connectors. There is a number of 4 pins in each connector.

Display menu description

The VHD7000D has three main display screens for indication and setup. The Main screens are:
BASIC - mutes, input levels, phase and +bass setup. **ADVANCED** for power state, speaker protection setup, diagnostics and factory reset. **NET** for network IP address and name indication.

BASIC



MUTE

Mute switch set channel mute on / off.

VOL

Sets the amplifier input sensitivity in range from -24 to +6 dBu with 0,5 dB steps.

PHASE

The PHASE switch allows you to invert the polarity of the output signal by 180°.
0° position – the signal is reproduced without phase inversion.
180° position – the signal polarity is inverted (phase-shifted by 180°).

SUB-EQ

Switch activates a bass enhancement feature that increases output by 6 dB at 30 Hz.

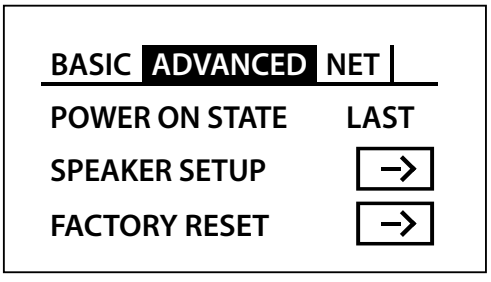
DELAY

The DELAY function allows you to adjust the signal delay from 0 to 109.2 ms in 0.1 ms steps.

LPF

The selectable low-pass filter frequencies: 70 Hz, 120 Hz, 150 Hz, 500 Hz.
A 12 dB per octave Butterworth filter is employed to ensure optimal matching with other KV2 Audio devices equipped with crossovers. This function is typically used to route only low-frequency content to subwoofers, while allowing mid/high frequencies to be managed by additional system components.

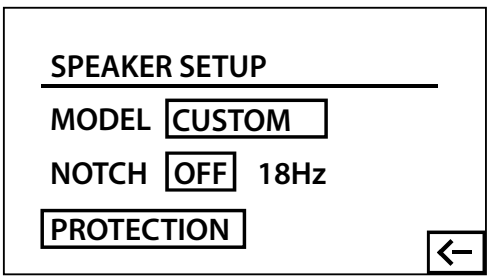
ADVANCED



POWER ON STATE

This function defines the behavior of the amplifier after mains power is applied or restored (e.g., after a power outage).

STBY - remains switched off
ON - powers on automatically
LAST - returns to the last used state

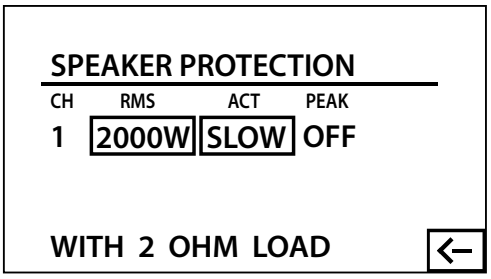


SPEAKER SETUP

MODEL
When using factory presets, all protection parameters are preset to safely deliver maximum performance. Factory presets are available for the following loudspeakers: VHD2.16, VHD4.18, VHD4.21, VHD2.18J, VHD1.21, and CUSTOM.
When the CUSTOM mode is selected, the following parameters can be adjusted:
NOTCH – Notch Filter, adjustable from 16 Hz to 25 Hz in 1 Hz steps.

PROTECTION

Sets the internal speaker protection.



RMS - The RMS Limiter Protection circuit continuously measures long term RMS value, (speaker heating effect) and reduces input sensitivity to keep the amplifier output under the set maximum level. Protects the loudspeaker against thermal overload. The speaker protection may be set at levels from 1000 W to 3000 W in 8 steps. Output power is calculated for a 2 Ω output load.

ACT - RMS Limiter response time: FAST / SLOW. Sets the response time of the RMS limiter. For loudspeakers with voice coils smaller than 4", we recommend using ACT FAST.

PEAK - Peak Limiter selectable at 80 V, 90 V, or OFF. Reduces the maximum output level, prevents smaller speakers from being overloaded with peak power they cannot handle.

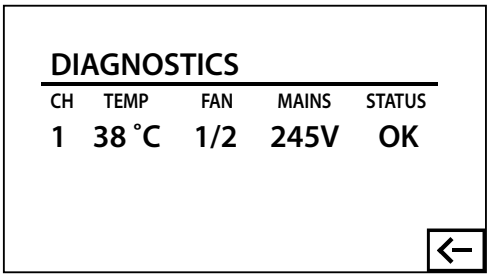
Proper configuration of protection parameters ensures both maximum performance and safe operation.
For more protection setup information refer to Remote management section.

FACTORY RESET

Resets the VHD7000D amplifier channel settings back to factory default. Device identification, Security and Network setup may be reset using the rear panel reset button.

DIAGNOSTICS

Displays the basic diagnostic information of the amplifier:



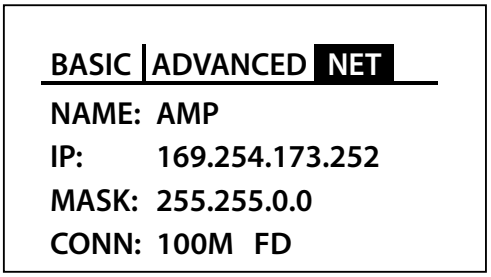
TEMP - amplifier heatsink temperature

FAN - fan speed 1 or 2

MAINS - measured mains voltage

STATUS - overall operating status of the amplifier

NET



NAME: displays amplifier name.

IP: displays assigned network address.

MASK: displays assigned network subnet mask.

CONN: displays the Ethernet connection speed and its current status

Amplifier name and IP address may be changed using web-server.

VHD7000D Web-server

The VHD7000D web-server is accessible using a standard web browser on PC or mobile device. The appropriate VHD7000D network address must be set to access web-server. The web-browser device IP address must be set from the same network range and must be connected into the same network.

IP addresses are assigned to networked devices when they are configured for a specific network. The way that they are assigned can be static or dynamic.

The VHD7000D network address may be set several ways:

Auto IP

(Default) Automatic Private IP Addressing, is a method of automatically assigning IP addresses to networked devices. A networked device configured to use Auto IP first makes a request to a DHCP server for an address. If the device does not receive an IP address, which happens when there is no DHCP server on the network or when the DHCP server is not responding, the device assigns itself an address. Auto IP addresses always follow this pattern: **169.254.x.y**, where **x** and **y** are any two numbers between 0 and 255. Unlike DHCP, Auto IP does not require a router or a separate server to assign an IP address. Selected IP address is displayed on display - section NET, or can be obtained using KV2 diagtool software.

DHCP

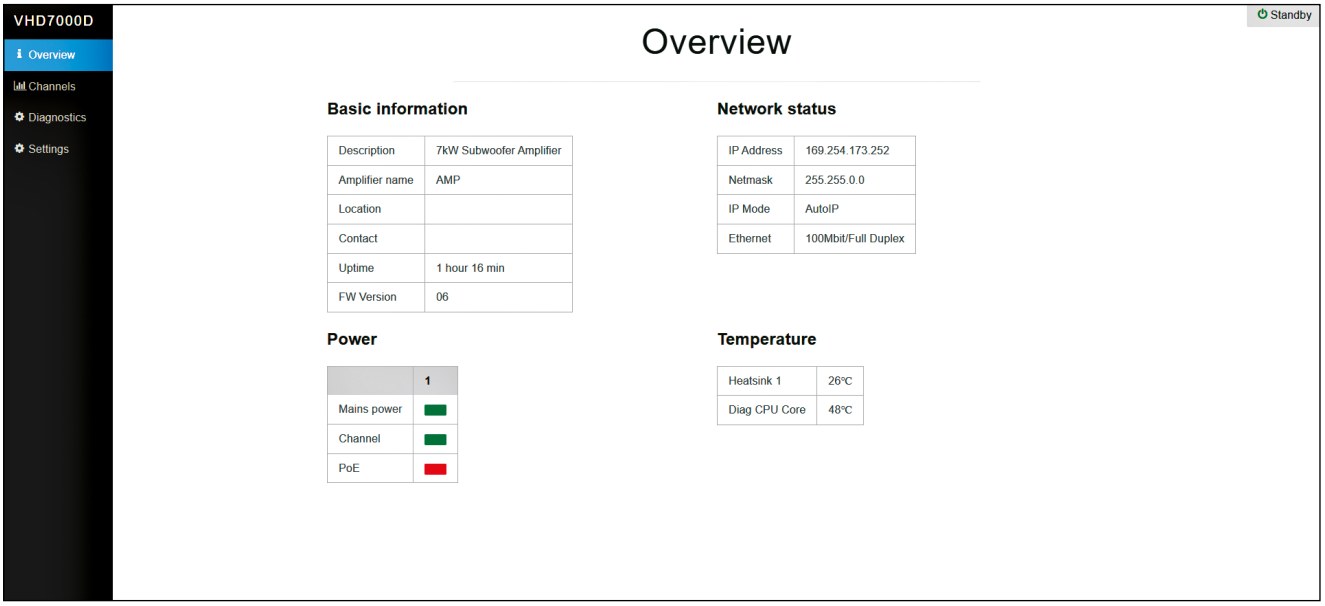
Dynamic Host Configuration Protocol. A DHCP server enables network devices to request IP addresses and networking parameters automatically from the DHCP server, reducing the need for a network administrator or a user to manually assign IP addresses to all network devices. The Assigned IP address is displayed on display - section NET, or can be obtained using the KV2 diagtool software.
It is important to know that a dynamic IP address can change. If a network device with a dynamic IP address suddenly stops responding at its IP address, it is possible that it has obtained a new lease and its address has changed.

Static

A static IP address must be manually assigned to a network device. This address is typed by the person who sets up devices on the network, and it never changes. A static IP address changes when the person who administers the network specifically changes it.

Web-server page

Open the VHD7000D web-server, use the VHD7000D IP address, which is shown on display - section NET, or can be obtained using the KV2 diagtool software (open Administration).
Default username: admin, default password: admin.



Overview

Shows the amplifier basic information.

Basic Information

Shows the information assigned by user of the amplifier: Description, Amplifier name, Location, Contact, Uptime and Firmware revision.

Network status

Shows the amplifier ethernet network address, netmask, mode and status.

Power

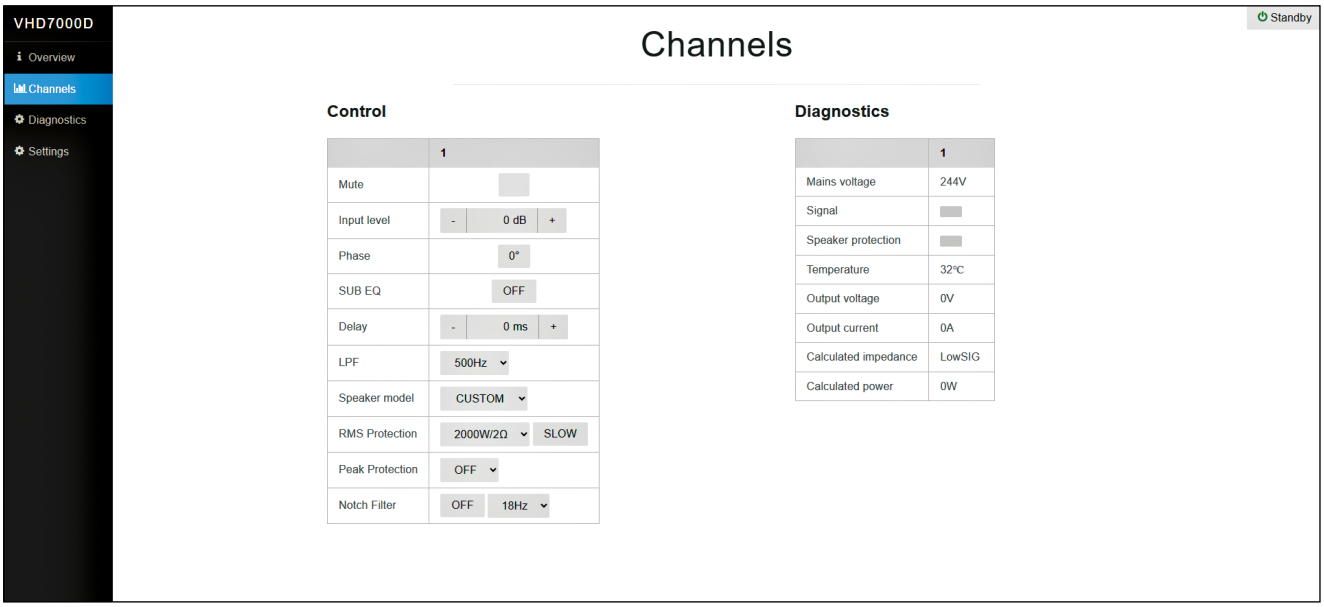
Shows the amplifier power sources status: Mains power Channel power source, Power over Ethernet (PoE).

Temperature

Shows the amplifier's heat sink temperature and Diagnostic CPU temperature.

Standby

The Standby function reduces the amplifier's power consumption by powering down the main power source, output stage and non-essential circuits, while keeping the unit ready for immediate operation. The network, Ethernet, and DIAGNOSTICS sections remain active, allowing remote power on / standby control.



Channels

Shows the amplifier control parameters and amplifier diagnostics information.

Control

Mute (RED = amplifier muted)

Input level (-24 to +6 dB)

Phase (0°, 180°)

SUB EQ - activates a bass enhancement feature that increases the chosen channels output by 6 dB at 30 Hz. This is suitable for low frequency compensation.

Delay (0 to 109.2 ms in 0.1 ms steps) Delay changes are reflected in real time.

LPF - Selectable low-pass filter frequencies: 70 Hz, 120 Hz, 150 Hz, 500 Hz. A 12 dB per octave Butterworth filter is used to match another KV2 audio device equipped with a crossover.

Speaker model - The amplifier includes adjustable RMS (thermal) and PEAK protection for speakers. Using the Speaker Model function, you can select factory presets optimized for KV2 Audio bass loudspeakers. When connecting other loudspeakers, simply choose the CUSTOM option to set the protection according to your needs.

Preset Configuration

When using factory presets, the protection is pre-configured to:
- Maximize output SPL without causing excessive voice coil heating
- Minimize thermal compression, which reduces efficiency at high temperatures
- Maintain natural sound dynamics even during continuous high-output operation

RMS Protection:

The RMS limiter is a critical component for both protecting the loudspeaker and preserving consistent audio performance, especially in high-power systems.
- The amplifier includes an integrated RMS limiter, designed to provide long-term protection of loudspeaker components from overheating while ensuring stable output performance under demanding conditions.
- The RMS limiter monitors the average power level delivered to the speaker over a longer period of time. It simulates the thermal behavior of the voice coil, allowing it to estimate internal temperature buildup and respond accordingly.

This enables smooth and accurate control of power to prevent excessive heating, which could otherwise lead to thermal compression or even permanent damage to the driver.
- RMS limiter can be set in range from 1 000 W to 3 000 W, power is calculated for 2 Ω load.

RMS Limiter response time: FAST / SLOW. Sets the response time of the RMS limiter. For loudspeakers with voice coils smaller than 4", we recommend using ACT FAST.

Peak protection:
The VHD7000D includes a peak limiter that protects loudspeakers from mechanical damage caused by excessive signal peaks. It keeps the speaker cone within its safe range of motion and prevents overloading smaller speakers with more power than they can handle, even for a short time. Peak limiter helps ensure safe and reliable performance, even at high volume levels.
- Peak limiter can be set to 80 V, 90 V or OFF (approximately 120 V)

Notch Filter:
Resonance Suppression Using a Tunable Notch Filter.
Every bass loudspeaker system has a resonant frequency at which its behavior can become problematic. At this frequency, the speaker cone can experience excessive excursion. This can lead to distorted bass, reduced clarity, and shorter lifespan of the speaker. This resonance occurs as a result of the interaction between the loudspeaker driver and the enclosure, forming a system that naturally amplifies motion at a specific low frequency–typically in the 16 to 30 Hz range.
The VHD7000D amplifier includes a tunable notch filter. This narrow-band filter can be adjusted in 1 dB steps from 16 Hz to 25 Hz and suppress the resonant frequency of the speaker system. Only the frequency of the filter needs to be set. This simple but effective tool helps to significantly improve the sound quality and safety of your bass system.

Loudspeaker Protection Presets

PRESET NAME	RMS OUTPUT (2 Ω)	PROTECTION SPEED	PEAK VOLTAGE LIMIT	NOTCH
VHD 2.16 (4× VHD 2.16 OR ES 2.6)	1 600 W	FAST	OFF	20 Hz
VHD 4.18 (4× VHD 4.18 OR ES 1.8)	1 400 W	FAST	80 V	20 Hz
VHD 4.21 (2× VHD 4.21 or 2.21)	2 600 W	SLOW	OFF	21 Hz
VHD 2.18J (2× VHD 2.18J)	2 000 W	SLOW	OFF	21 Hz
VHD 1.21 (4× VHD 1.21)	1 400 W	SLOW	OFF	OFF
CUSTOM SETTING	1 000 W - 3 000 W	FAST / SLOW	80 / 90 / OFF	16 - 25 Hz

Preset Name refers to the type of KV2 Audio loudspeaker being connected, or Custom if another configuration is used. RMS indicates the amplifier's output power at a 2 Ω load. The preset setting does not depend on the number of cabinets connected in parallel.

Diagnostics
Shows amplifier diagnostics information.

Mains voltage

Signal
Green when input signal is present.

Speaker protection
Orange when speaker protection hits.

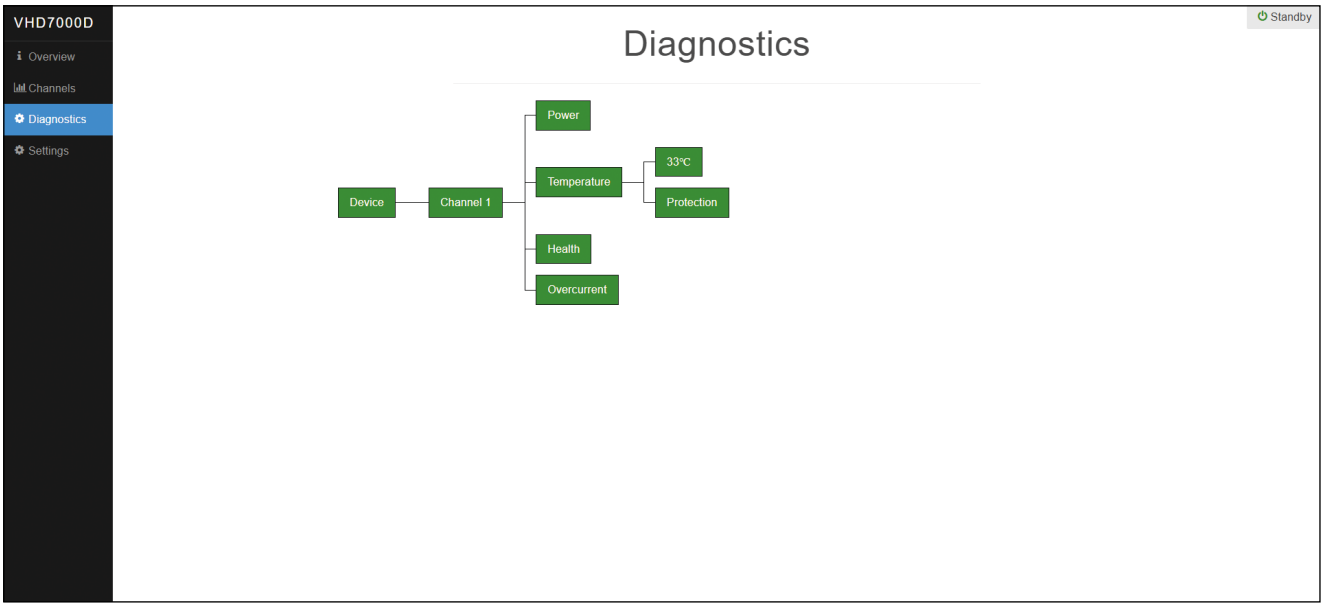
Temperature
Displays amplifiers heat sink temperature (°C).

Output voltage
Shows the amplifier speaker output voltage.

Output current
Shows the amplifier speaker output current.

Calculated impedance
Shows the amplifier speaker output connected speaker impedance.

Calculated power
Shows the amplifier speaker output calculated output power.



Diagnostics

Shows the VH7000D amplifier and its components diagnostics information. Dual colour - Green = OK / Red = no power or some problem occurs.

Device

Sums VHD7000D diagnostics together.

Channel 1

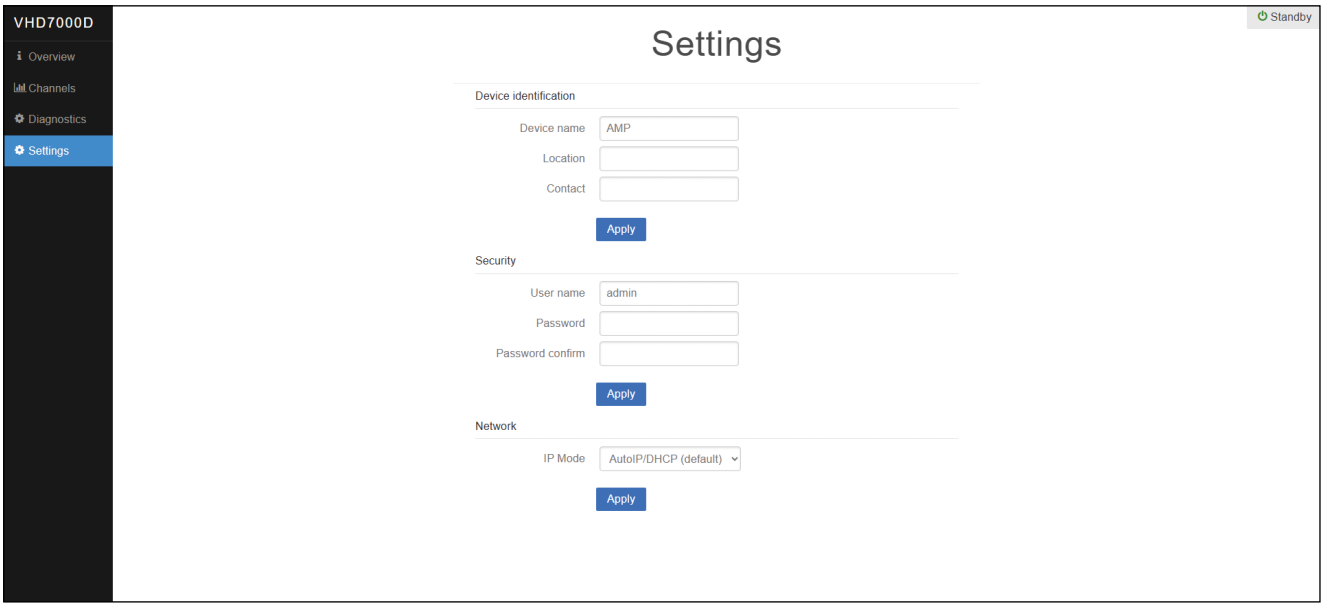
Sums amplifier channel diagnostics information: Power source, Temperature, Health (amplifiers is working OK with dedicated gain), Amplifier overcurrent.

Temperature

Displays amplifiers heat sink temperature (°C).

Protection

When red, they indicate that the amplifier has overheated (80 °C) and mutes the input. The unit will Auto Reset after it cools down to a safe operating temperature.



Settings

Shows and sets the device information, web-server password, network address.

Device identification

Shows and sets the device local information, Device name, Location, Contact.

Security

Sets name and password for web-server security (default User name: admin, default Password: admin).

Network

Sets the Ethernet IP mode. AutoIP/DHCP (default). Static (IP address and netmask must be set).

Specifications

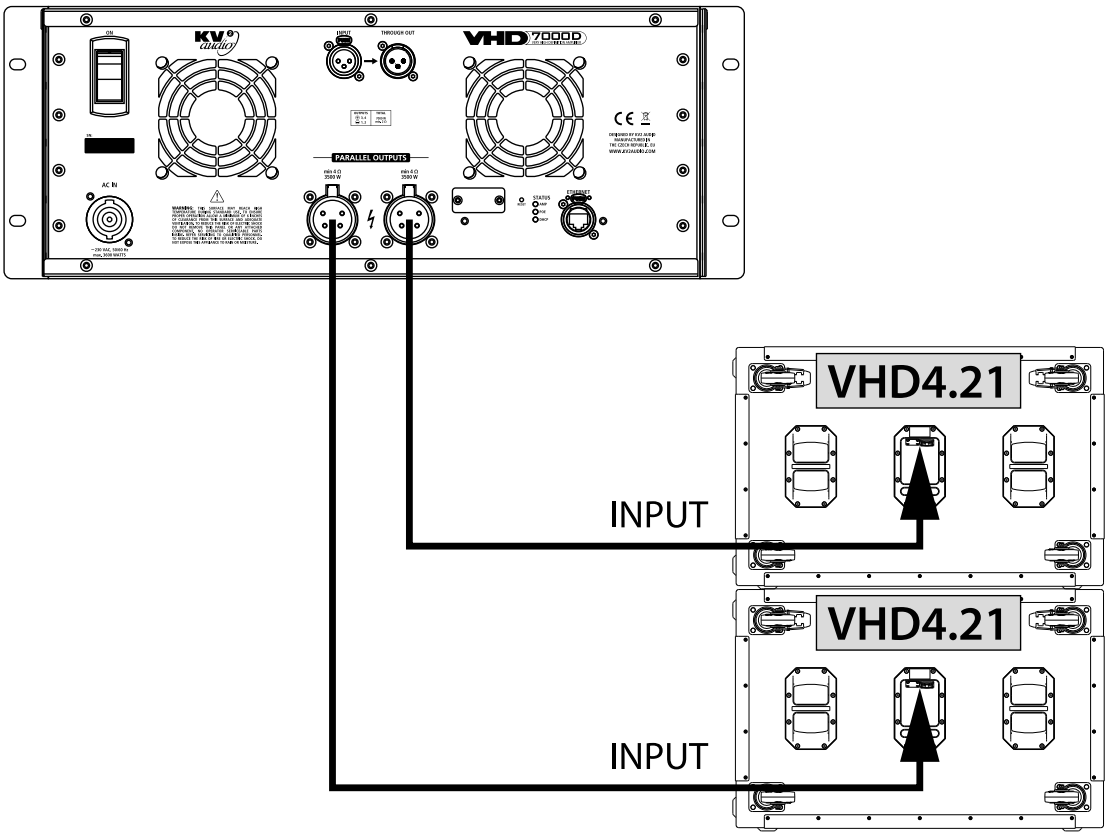
Output Channels	
Number of Channels	1
Voltage Gain	39 dB
Max. Output Voltage	165 V (peak)
Max. Output Current	82 A (peak)
Minimum load impedance	2 Ω
Out. Power 2 Ω	3 500 W long-term / 7 000 W short-term
Out. Power 4 Ω	2 700 W long-term / 3 600 W short-term
Low Frequency Amplifier Specification	
Type	High efficiency, Current-Enhancing, Switched-Rail Amplifier
Rated Continuous Power	3 500 W (RMS)
Peak Power	14 000 W
Distortion	<0.05%
Operating Bandwidth	10 Hz to 500 Hz
Signal Input	
Input Sensitivity	1.55 V RMS
Input Impedance	20 kΩ (balanced)
Signal Output	Through OUT
Features	
Input Level Control	-24 dB / +6 dB
Delay Range	0 to 109.2 ms, step 0.05 ms
Phase	0° / 180°
Notch Filter	16 to 25 Hz, step 1 Hz
Loudness bass enhancement	SUB EQ (+6 dB @ 30 Hz)
RMS Limiter	FAST / SLOW, 1 000 to 3 000 W, 8 steps
Low Pass Filter	70, 120, 150, 500 Hz
Peak Limiter	80 V, 90 V, OFF
Power Requirements	
Power Connector	1x Neutrik PowerCon® 32 A
Operating Voltage	230 V
Operating Voltage Range	200 to 250 V @ 50 Hz |60 Hz
Recommended Amperage	16 A
Soft Start	YES
Protection	Thermal breaker
Cooling	2x temperature controlled fans
Physical Dimensions	
Height	177 mm (6.96"), 4RU
Width	481.4 mm (18.95")
Depth	484.9 mm (19.09")
Weight	26 kg (57.32 lb)

Outputs connections

Speaker output connectors are wired in parallel. The minimum recommended output load is 4 Ω per connector.
Use KV2 LF cables with 4-pin Amphenol connectors (AP4) only.

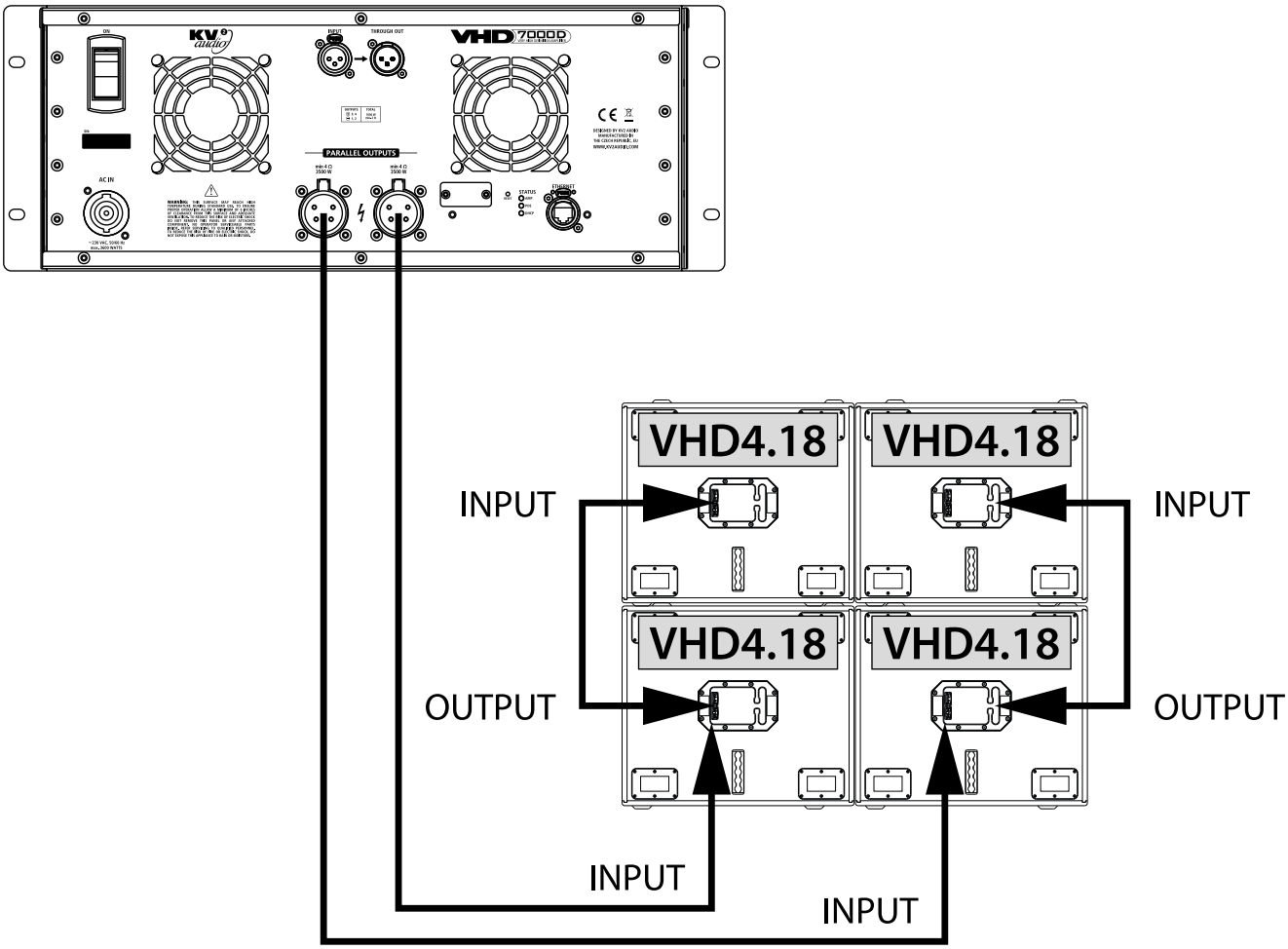
Example 1

2x VHD4.21 (4 Ω each)
- total impedance 2 Ω

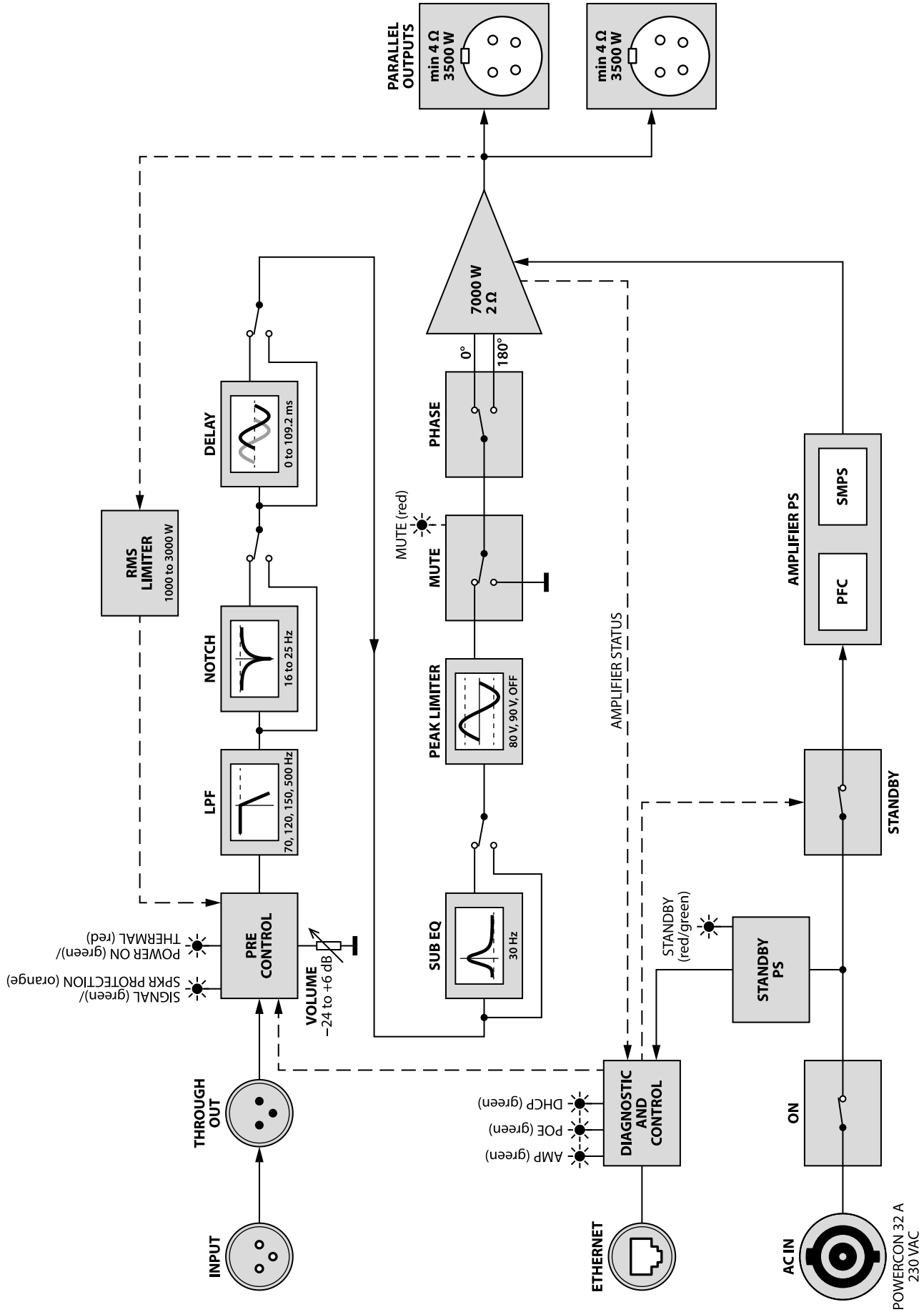


Example 2

4x VHD4.18 (8 Ω each)
- total impedance 2 Ω



VHD7000D Block Diagram



Warranty

Your VHD7000D is covered against defects in material and workmanship.

Please refer to your supplier for more details.

Service

In the unlikely event that your VHD7000D develops a problem, it must be returned to an authorized distributor, service centre or shipped directly to our factory. Because of the complexity of the design and the risk of electrical shock, all repairs must be attempted only by qualified technical personnel.

If the unit needs to be shipped back to the factory, it must be sent in its original carton. If improperly packed, the unit may be damaged.

To obtain service, contact your nearest KV2 Audio Service Centre, Distributor or Dealer.

The Future of Sound.
Made Perfectly Clear.

KV2 Audio International
Nádražní 936, 399 01 Milevsko
Czech Republic

Tel.: +420 383 809 320
Email: info@kv2audio.com

www.kv2audio.com

KVV120170-00-01-0