

# User Manual



D4-500

# Power Amplifier

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**4** D4-500  
Power Amplifier



# 1 General information

This document contains important instructions for the safe operation of the product. Read and follow the safety instructions and all other instructions. Keep the document for future reference. Make sure that it is available to all those using the product. If you sell the product to another user, be sure that they also receive this document.

Our products and documentation are subject to a process of continuous development. They are therefore subject to change. Please refer to the latest version of the documentation, which is ready for download under [www.thomann.de](http://www.thomann.de).

## 1.1 Symbols and signal words

In this section you will find an overview of the meaning of symbols and signal words that are used in this document.

Signal word	Meaning
<b>DANGER!</b>	This combination of symbol and signal word indicates an immediate dangerous situation that will result in death or serious injury if it is not avoided.
<b>WARNING!</b>	This combination of symbol and signal word indicates a possible dangerous situation that can result in death or serious injury if it is not avoided.
<b>NOTICE!</b>	This combination of symbol and signal word indicates a possible dangerous situation that can result in material and environmental damage if it is not avoided.
Warning signs	Type of danger
	Warning – high-voltage.
	Warning – danger zone.

## 2 Safety instructions

### Intended use

This device amplifies electric audio frequency signals to operate passive speakers. Use the device only as described in this user manual. Any other use or use under other operating conditions is considered to be improper and may result in personal injury or property damage. No liability will be assumed for damages resulting from improper use.

This device may be used only by persons with sufficient physical, sensorial, and intellectual abilities and having corresponding knowledge and experience. Other persons may use this device only if they are supervised or instructed by a person who is responsible for their safety.

### Safety



#### **DANGER!**

#### **Risk of injury and choking hazard for children!**

Children can suffocate on packaging material and small parts. Children can injure themselves when handling the device. Never allow children to play with the packaging material and the device. Always store packaging material out of the reach of babies and small children. Always dispose of packaging material properly when it is not in use. Never allow children to use the device without supervision. Keep small parts away from children and make sure that the device does not shed any small parts (such knobs) that children could play with.



#### **DANGER!**

#### **Danger to life due to electric current!**

Within the device there are areas where high voltages may be present. Never remove any covers. There are no user-serviceable parts inside. Do not use the device when covers, safety equipment or optical components are missing or damaged.



### **DANGER!**

#### **Danger to life due to electric current!**

A short circuit could lead to a fire hazard and risk of death. Always use proper ready-made insulated triple-core mains cable with a safety plug. Do not modify the mains cable or the plug. In case of isolation damage, disconnect immediately the power supply and arrange repair. If in doubt, seek advice from a qualified electrician.



### **WARNING!**

#### **Possible hearing damage due to high volumes on speakers!**

With loudspeakers connected, the device can produce volume levels that may cause temporary or permanent hearing impairment. Over an extended period of time, even levels that seem to be uncritical can cause hearing damage. Do not operate the device permanently at a high volume level. Decrease the volume level immediately if you experience ringing in your ears or hearing impairment. If this is not possible, keep a greater distance to the speaker or use adequate ear-muffs.



### **NOTICE!**

#### **Risk of fire due to covered vents and neighbouring heat sources!**

If the vents of the device are covered or the device is operated in the immediate vicinity of other heat sources, the device can overheat and burst into flames. Never cover the device or the vents. Do not install the device in the immediate vicinity of other heat sources. Never operate the device in the immediate vicinity of naked flames.



### **NOTICE!**

#### **Damage to the device if operated in unsuitable ambient conditions!**

The device can be damaged if it is operated in unsuitable ambient conditions. Only operate the device indoors within the ambient conditions specified in the "Technical specifications" chapter of this user manual. Avoid operating it in environments with direct sunlight, heavy dirt and strong vibrations. Avoid operating it in environments with strong temperature fluctuations. If temperature fluctuations cannot be avoided (for example after transport in low outside temperatures), do not switch on the device immediately. Never subject the device to liquids or moisture. Never move the device to another location while it is in operation. In environments with increased dirt levels (for example due to dust, smoke, nicotine or mist): Have the device cleaned by qualified specialists at regular intervals to prevent damage due to overheating and other malfunctions.



**NOTICE!****Damage to the device due to high voltages!**

The device can be damaged if it is operated with the incorrect voltage or if high voltage peaks occur. In the worst case, excess voltages can also cause a risk of injury and fires. Make sure that the voltage specification on the device matches the local power grid before plugging in the device. Only operate the device from professionally installed mains sockets that are protected by a residual current circuit breaker (FI). Ensure that the power cord plug is easily accessible at all times if it is the only device to safely disconnect the device from the mains supply. As a precaution, disconnect the device from the power grid when storms are approaching or if the device will not be used for a longer period.

**NOTICE!****Interference with nearby electrical devices due to magnetic fields!**

The device generates strong magnetic fields that can interfere with the function of poorly shielded devices. The magnetic fields are strongest directly above and below the Power Amplifier. You should therefore never place sensitive devices such as pre-amplifiers, radio transmission systems, or tape decks directly above or below the Power Amplifier. When placing the Power Amplifier in a rack, you should place it at the bottom thereof, and place any other equipment at the top of the rack.

**NOTICE!****Possible staining due to plasticiser in rubber feet!**

The plasticiser contained in the rubber feet of this product may react with the coating of the floor and cause permanent dark stains after some time. If necessary, use a suitable mat or felt slide to prevent direct contact between the product's rubber feet and the floor.

### 3 Features

- 4-Channel Class D Power Amplifier
- 4 inputs, 4 outputs
- Temperature-controlled fan
- Frequency response 20 Hz to 20 kHz
- Suitable for 19-inch racks (1 RU, installation depth 240 mm)

## 4 Installation and starting up



### **NOTICE!**

#### **Possible staining due to plasticiser in rubber feet!**

The plasticiser contained in the rubber feet of this product may react with the coating of the floor and cause permanent dark stains after some time.

If necessary, use a suitable mat or felt slide to prevent direct contact between the product's rubber feet and the floor.

Unpack and check carefully there is no transportation damage before using the unit. Keep the equipment packaging. To fully protect the product against vibration, dust and moisture during transportation or storage use the original packaging or your own packaging material suitable for transport or storage, respectively.

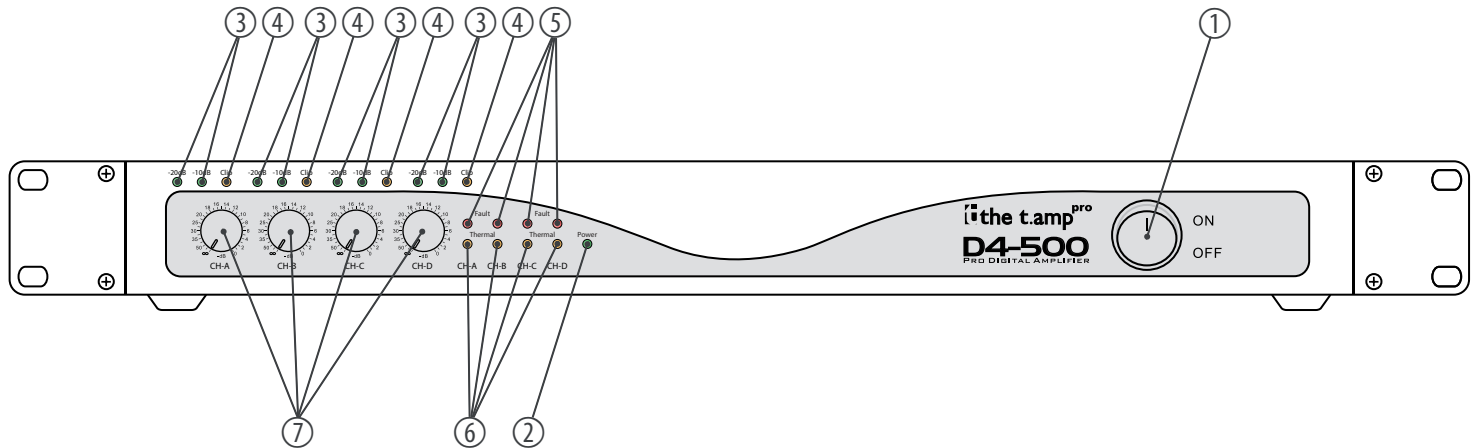
Create all connections while the device is off. Use the shortest possible high-quality cables for all connections. Take care when running the cables to prevent tripping hazards.

### **Rack mounting**

The unit has been designed for rack mounting in a standard 19-inch rack; it occupies one rack unit.

## 5 Connections and controls

### Front



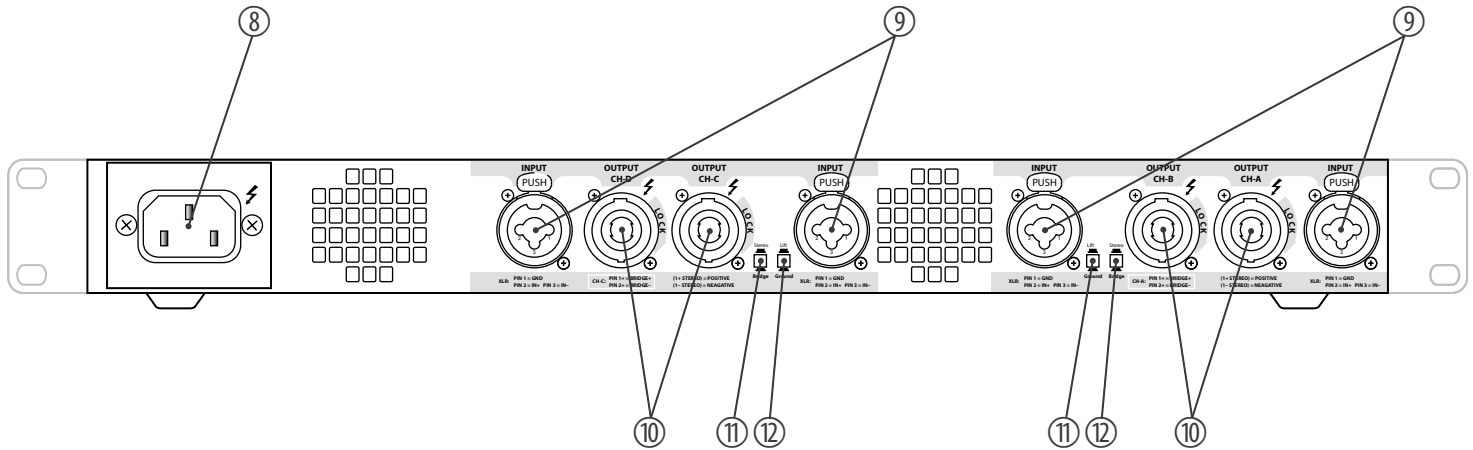
1 [ON | OFF] | Main switch for turning the device on and off.

2 [Power] LED | This LED indicates that the device is operational and lights up constantly as soon as the device is switched on.

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3	LEDs [ <i>-10 dB</i> ] and [ <i>-20 dB</i> ]   These LEDs indicate the intensity of the input signal (-10 dB or -20 dB). If none of the LEDs lights up, increase the signal level with the controls CH-A to CH-D and check the wiring if necessary. If these LEDs are on even though there is no input signal, this means that a fault has occurred. In this case, disconnect the speakers from the power amplifier and turn the controls for the input gain of channels CH-A to CH-D down to minimum. If the LEDs remain on, the device must be checked by an authorised service workshop.
4	[ <i>Clip</i> ] LEDs   Overload indicator for channels CH-A to CH-D. These LEDs light up if the distortion of the output signal exceeds 1%.
5	[ <i>Fault</i> ] LEDs   Error indication for channels CH-A to CH-D. These LEDs light up when one of the protective circuits is triggered (see <a href="#">↪ Chapter 6 'Technical specifications' on page 16</a> ). The LEDs light up for three seconds when the device is turned on. During this time, there is no signal present on the output yet. The device is operational as soon as the LEDs go out.
6	[ <i>Thermal</i> ] LEDs   Excess temperature indicator for the channels CH-A to CH-D. These LEDs light up when the respective heat sink exceeds a certain temperature. The LEDs light up for three seconds when the device is turned on. During this time, there is no signal present on the output yet. The device is operational as soon as the LEDs go out.
7	[ <i>CH-A...CH-D</i> ]   Controller for the input amplification of the channels CH-A to CH-D

## Back



8	Rubber panel plug
9	<i>[INPUT CH-A...CH-D]</i>   Signal inputs, designed as lockable XLR/6.35-mm jack combo sockets
10	<i>[OUTPUT CH-A...CH-D]</i>   Signal outputs, designed as lockable, four-pin Speaker Twist sockets
11	<i>[Stereo   Bridge]</i> push-button   Switch for "stereo" (all channels work independently) and "bridge" modes. In "Bridge" mode, only the signal outputs <i>[OUTPUT CH-A]</i> and <i>[OUTPUT CH-C]</i> can be used. The wiring is as follows: '1+ = Bridge+', '2+ = Bridge-'
12	<i>[Lift   Ground]</i> push-button   The Ground/Lift switch allows you to interrupt the connection between the device's earth conductor and signal ground in order to prevent hum loops (Lift position / not pressed: not connected. Ground position / pressed: Earth conductor and signal ground are electrically connected).

## 6 Technical specifications

Amplifier class	D		
Input impedance	20 k $\Omega$ (balanced) 10 k $\Omega$ (unbalanced)		
Output power	Power @ 1 kHz, 1 % THD+N (continuous EN60268-3, peak CEA-2006, max. gain)	Continuous	Peak
	4 channels, 4 $\Omega$ :	4 $\times$ 360 W	4 $\times$ 415 W
	3 channels, 4 $\Omega$ :	3 $\times$ 400 W	3 $\times$ 430 W
	2 channels, 4 $\Omega$ :	2 $\times$ 470 W	2 $\times$ 480 W
	1 channel, 4 $\Omega$ :	1 $\times$ 550 W	1 $\times$ 580 W
	2 channels, 8 $\Omega$ :	2 $\times$ 270 W	2 $\times$ 280 W
	2 channels, 8 $\Omega$ , bridged:	2 $\times$ 770 W	2 $\times$ 870 W
Frequency response	20 Hz ... 20 kHz ( $\pm 2.5$ dB)		
Signal-to-noise ratio	107 dB (A-weighted)		
Total harmonic distortion (THD)	< 0.1%, typical		
Damping factor (100 Hz / 1 kHz, 4 $\Omega$ )	>500		



Sensitivity	1 V <sub>rms</sub> (rated power at 1 kHz)		
Gain	37 dB		
Max. voltage swing (RMS)	35 V (THD = 1%, 1 kHz)		
Slew rate (1 kHz)	26 V/μs		
DIM 30	< 0.1% (3.15 kHz, 15 kHz)		
Crosstalk	> 75 dB (ref. 1 kHz, 10% rated power)		
Protective circuits	VHF, direct current, temperature, short circuit, undervoltage, overvoltage, limiter		
Power consumption	Typical current draw depending on the output power level (RMS value A <sub>RMS</sub> ). All values based on a 230 V ~ mains voltage and a 1 kHz input signal at 0 dB (sine).		
	Load	1/8 nominal power	1/3 nominal power
	8 Ω (× 4)	130 W / 1.3 A	190 W / 1.9 A
	4 Ω (× 4)	180 W / 1.6 A	420 W / 3.1 A
	8 Ω bridged (× 2)	190 W / 1.6 A	430 W / 3.2 A
Inrush current	30 A, 2 ms		
Supply voltage	230 V ~ 50 Hz		
Dimensions (W × H × D)	483 mm × 45 mm × 240 mm		
	1 RU in 19-inch rack, installation depth 240 mm		

## Technical specifications

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Weight	4.6 kg	
Ambient conditions	Temperature range	0 °C...40 °C
	Relative humidity	20%...80% (non-condensing)

## 7 Plug and connection assignment

### Introduction

This chapter will help you select the right cables and plugs to connect your valuable equipment in such a way that a perfect sound experience is ensured.

Please note these advices, because especially in 'Sound & Light' caution is indicated: Even if a plug fits into the socket, an incorrect connection may result in a destroyed power amp, a short circuit or 'just' in poor transmission quality!

### Balanced and unbalanced transmission

Unbalanced transmission is mainly used in semi-professional environment and in hifi use. Instrument cables with two conductors (one core plus shielding) are typical representatives of the unbalanced transmission. One conductor is ground and shielding while the signal is transmitted through the core.

Unbalanced transmission is susceptible to electromagnetic interference, especially at low levels, such as microphone signals and when using long cables.

In a professional environment, therefore, the balanced transmission is preferred, because this enables an undisturbed transmission of signals over long distances. In addition to the conductors 'Ground' and 'Signal', in a balanced transmission a second core is added. This also transfers the signal, but phase-shifted by 180°.

Since the interference affects both cores equally, by subtracting the phase-shifted signals, the interfering signal is completely neutralized. The result is a pure signal without any noise interference.

## 1/4" TS phone plug (mono, unbalanced)



1	Signal
2	Ground, shielding

## 1/4" TRS phone plug (mono, balanced)



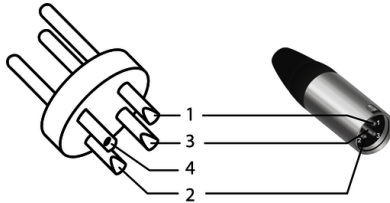
1	Signal (in phase, +)
2	Signal (out of phase, -)
3	Ground

## 1/4" TRS phone plug (stereo, unbalanced)



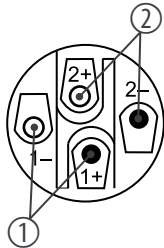
1	Signal (left)
2	Signal (right)
3	Ground

**XLR plug (balanced)**



1	Ground, shielding
2	Signal (in phase, +)
3	Signal (out of phase, -)
4	Shielding on plug housing (option)

**Speaker Twist chassis connector**



1, +	Signal 1 (in phase)
1, -	Signal 1 (out of phase)
2, +	Signal 2 (in phase)
2, -	Signal 2 (out of phase)

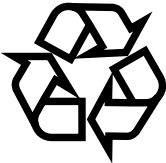
## 8 Cleaning

### Fan grids

The fan grids of the device must be cleaned of any contamination, such as dust, etc. on a regular basis. Before cleaning, switch off the device and disconnect mains-operated devices from the mains. Only use pH-neutral, solvent-free and non-abrasive cleaning agents. Clean the unit with a slightly damp lint-free cloth.

# 9 Protecting the environment

## Disposal of the packing material



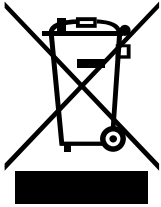
Environmentally friendly materials have been chosen for the packaging. These materials can be sent for normal recycling. Ensure that plastic bags, packaging, etc. are disposed of in the proper manner.

Do not dispose of these materials with your normal household waste, but make sure that they are collected for recycling. Please follow the instructions and markings on the packaging.



Observe the disposal note regarding documentation in France.

### Disposal of your old device



This product is subject to the European Waste Electrical and Electronic Equipment Directive (WEEE) as amended.

Do not dispose of your old device with your normal household waste; instead, deliver it for controlled disposal by an approved waste disposal firm or through your local waste facility. If in doubt, consult your local waste management facility. You can also return the device to a retailer if they offer to take the device back for free or if they are legally obliged to do so. When disposing of the device, comply with the rules and regulations that apply in your country. You can also return your old device to Thomann GmbH at no charge. Check the current conditions on [www.thomann.de](http://www.thomann.de).

Proper disposal protects the environment as well as the health of your fellow human beings. This is because the proper handling of old devices negates the potential negative effects of hazardous substances, and because it conserves resources by recycling them.

Also note that waste avoidance is a valuable contribution to environmental protection. Repairing a device or passing it on to another user is an ecologically valuable alternative to disposal.

If your old device contains personal data, delete those data before disposing of it.









