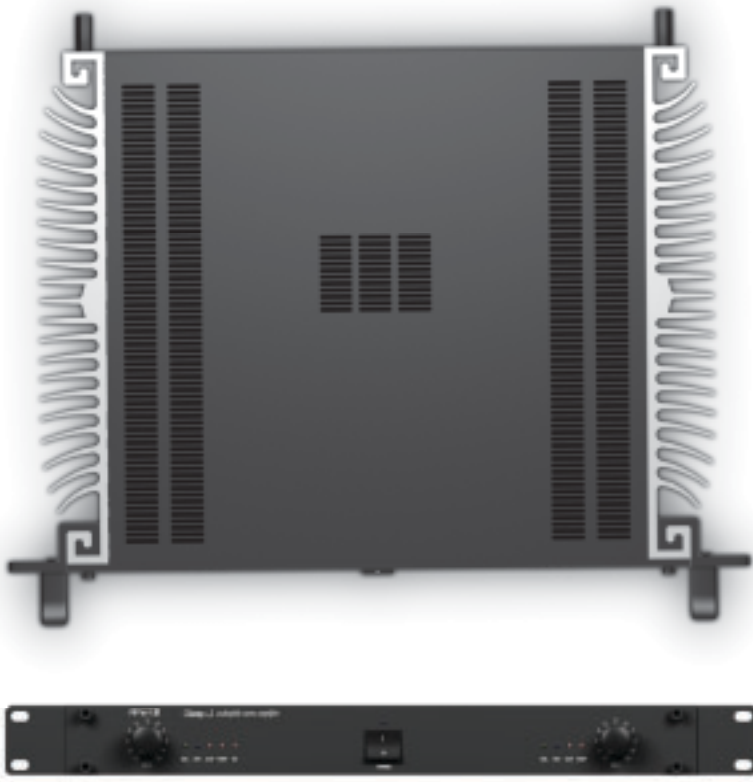
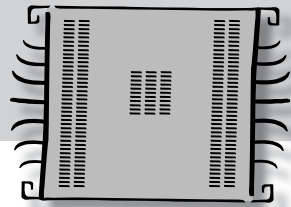


## MANUAL



## *Champ - 2*

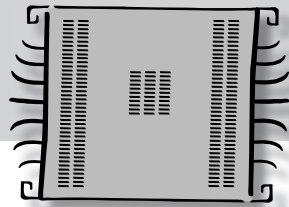
***Audiophile Stereo Power Amplifier***



## **Safety First!**

- **Caution: hot and sharp surfaces ! This professional device needs to be installed by qualified personnel only.**
- Please check the carton box for any kind of damage on reception of the goods. In case of a damaged carton, please contact your dealer before opening the carton.
- **!!!! Danger !!!!** Exposure to extremely high noise levels may cause a permanent hearing loss. Individuals vary considerably to noise induced hearing loss but nearly everyone will lose some hearing if exposed to sufficiently intense noise for a sufficient amount of time. Therefore it is recommended that all persons exposed to equipment capable of producing high sound pressure levels, such as this amplifier, be protected by hearing protection while installing or operating this unit.
- Read all documentation before operating your equipment.
- Keep all documentation for future reference.
- Save the carton and packing material even if the equipment has arrived in good condition.
- Should you ever need to ship the unit, use only the original factory packing.
- Do not spill water or other liquids into or on the unit.
- Make sure power outlets conform to the power requirements listed on the back of the unit.
- Do not use the unit if the electrical power cord is frayed or broken.
- Always operate the unit with the AC ground wire connected to the electrical system ground.
- Have gain controls on amplifiers turned down during power-up to prevent speaker damage if there are high signal levels at the inputs.
- Do not connect the inputs / outputs of amplifiers or consoles to any other voltage source, such as a battery, mains source, or power supply, regardless of whether the amplifier or console is turned on or off.
- Power down & disconnect units from mains voltage before making connections.
- Do not use the unit near stoves, heat registers, radiators, or other heat producing devices.
- Do not operate equipment on a surface or in an environment which may distort the normal flow of air around the unit. If the unit is used in an extremely dusty or smoky environment, the unit should be periodically "blown free" of dust.
- Do not remove the cover. Removing the cover will expose you to potentially dangerous voltages.
- Do not drive the inputs with a signal level higher than that required to drive equipment to full output.
- Do not run the output of any amplifier back into another input.
- Do not ground the red output terminal, never connect a red output terminal to another red output terminal.
- In case of mal-function this device should be serviced by qualified service personnel only.





## **Introduction**

Dear customer,

Why does live music leave an unforgettable impression on you ? The answer is simple: dynamics. The ability of a sound system to produce crystal clear low level sounds as well as extreme musical peaks without any distortion, the power to leave some headroom for those occasional peaks in music. Pure power ! This ease of music reproduction can not be described in figures or specifications.

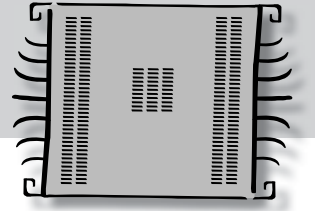
In the following pages we will explain how we have reached our goal. *Champ-2* features an exceptionally dynamic output stage, a unique class G amplifier, all packed in a one unit fanless enclosure. While our competitors are struggling with often poorly designed so called energy efficient class D digital amplifiers...well, we have taken a close look and listened carefully to some of these designs, and we were not impressed. We got inspired to make something APart from all the rest, and started from scratch.

Take a look at our new champion with his striking design and powerful set of features that will exceed the demands of passionate music lovers as well as system integrators. Designed with a continuous 4 ohm, 2 ohm dynamically stable high current output stage, *Champ-2* will surprise you with its sonic excellence and dynamic capacities. Remember, this unique amplifier has been developed with the impact of live music dynamics in mind. A true beauty, inside as well as outside, but also a beast if necessary.

Take your time and listen to our new *Champ-2* amplifier. Please fasten your seatbelts and beware, you might get blown away, not by the cooling fan, simply because there isn't any. Experience the pure musical power of *Champ-2*.

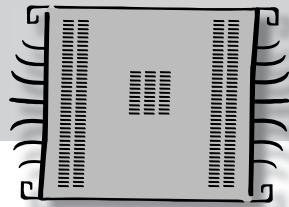
## **Manual contents**

- 1. Fanless design and highlights**
- 2. Features**
- 3. Inputs and outputs**
- 4. Rack mounting and wiring**
- 5. Standalone use**
- 6. Technical specifications**



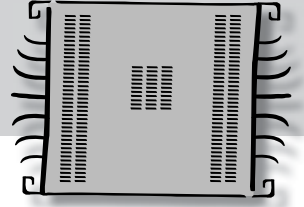
## 1. Fanless design and highlights

- Audiophile grade components mounted on solid aluminum and steel construction chassis for the highest possible signal integrity and reliability, even under difficult circumstances.
- High current, high voltage discrete output stage in class G configuration, capable of driving even the most demanding speaker systems and combinations. Either at low or high power, you **will** hear the *Champ-2* difference.
- Custom designed side mount heatsinks, in combination with class G amplifier topology have made it possible to create a discrete high power amplifier without the need of a noisy dust collecting cooling fan inside the enclosure. This means less maintenance, no annual fan or dust filter exchange procedure, no more amplifier cleanout ... **no unwanted noise from cooling fans**, *Champ-2* relies on convectional cooling only, a unique feature in this output power class, and all packed in a 1 unit 19 inch case!
- Integrated APC limiter circuitry and clip limiter adaptable to the actual speaker load. This intelligent circuit will prevent harsh distortion caused by clipping, provided that the input signal itself is not distorted of course...what goes in, comes out.
- A stunning 38800  $\mu$ F of high grade electrolytic capacitors, high power toroidal transformer for ultimate power reserve.
- Self-supporting low resonance steel subframe. Torsion free front and side panel construction with integrated heatsink assembly.
- Solid aluminum brushed front panel with removable 19" brackets and handles for use in a rack or as a standalone unit in high quality audio systems.
- Multi purpose input configuration featuring balanced inputs on XLR connectors and unbalanced inputs on RCA connectors ...



## 2. Features

- Intelligent **APC circuitry** constantly analyses incoming music signals and keeps dynamics alive. An additional ultra fast peak limiter avoids amplifier clipping in case someone hits the inputs too hard. Please remember, this is a musical amplifier, please leave some headroom and enjoy the music.
- Bridge or stereo mode: more than double the output power and convert this amplifier into a monoblock amplifier with one push on a button. **Minimum load impedance is 8 ohms in bridge mode.**
- Protection circuitry: the protection circuitry is another unique design feature of this amplifier: together with the APC circuitry, output signals are constantly monitored by the protection circuits, and speaker outputs will be cut in case of extreme overload, short circuits, DC offset, overheating... This circuit is also capable (within certain limits) of reducing the input signal to prevent clipping, distortion and other musically destructive situations. We have done our best to make sure this amplifier will produce clean power, but **it is also the user who is responsible for the final result: the APC circuitry can not clean up a clipped input signal, in other words: what goes in, comes out. Don't forget to set the impedance selector correctly for both channels and remember to divide the speaker's impedance by a factor 2 if you are planning to use the amplifier in bridge mode ! Example in bridge mode: speaker load = 8 ohms, set channel 1 impedance selector to  $8 : 2 = 4$  ohms setting (4 – 8 ohms).**
- Versatile input and output connector configuration with balanced and unbalanced inputs and additional line level signal outputs for linking the signal to other devices for increased flexibility. The speaker output terminals accept speaker cables as well as 4 mm banana plugs.
- Ground lift switch to enable you to find the cause of system ground loops in case of hum or excessive noise.

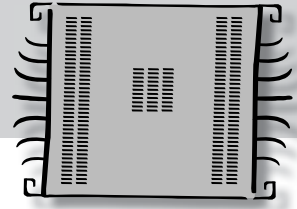


## **What is APC ?**

***APC is one of the most intelligent amplifier protection circuits ever designed, simply because it does the job without interfering with the typical dynamic character of music. APC allows you to fully exploit the potential of the amplifier, maintaining high power reserves and thus producing high, clean power.***

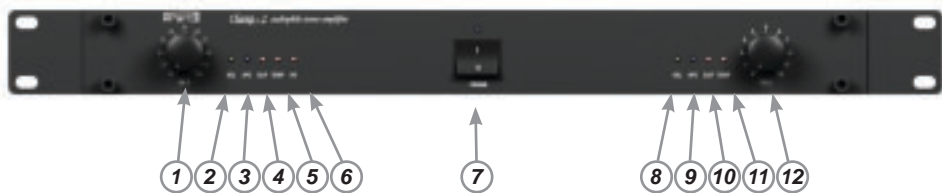
***It is a common misunderstanding that high power amplifiers will overload or destroy lower power speakers, the opposite is true. You can easily destroy a 500 Watt rated speaker with a simple 50 watt power amplifier ! Why ? In order to produce a low tone, such as a kick drum or bass guitar, you need about 80 % or more of an amplifier's power. Because distortion is less audible in low frequencies, you would want to increase the level more than the amplifier can supply. This causes low frequency distortion which causes high frequency harmonics. These harmonics contain more high frequency energy than the high frequency speaker can deal with. Result: harsh distortion and sudden heat rise in the high frequency speaker's voice coil. After a short while, the high power speaker may burn out.***

***Conclusion: don't punish your speakers with weak amplifiers. Set the APC control to a power level equal to your speaker's RMS input power and avoid hitting the clip limiter !***

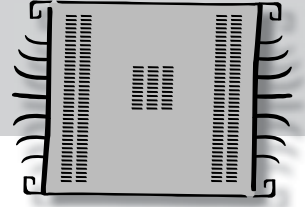


## 3. Inputs and outputs

Front panel layout:

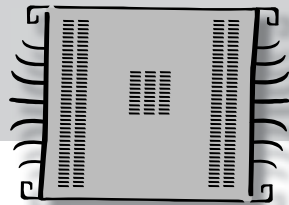


- 1) Volume potmeter channel 1: use this potmeter to preset the volume. In case the amplifier has been switched to bridge mode, this potmeter sets the level for bridge operation.
- 2) Signal led channel 1: this led lights up green when a sufficiently strong signal is present on the left channel, after passing the input level control. At startup, the led will light up red during a few seconds, this is perfectly normal. When it lights up red during use, the power transformer or power amplifier is overheated or in protect mode and is shut down. **The amplifier will not turn on automatically after most error conditions. In some cases, the user MUST turn off power and remove the overload and then power on again ! More details can be found in the table below.**
- 3) APC activity led left channel: this led lights up when the APC circuitry is active. The APC circuitry reduces the gain at the inputs to guarantee the full dynamic range of the power amplifier circuits.
- 4) Clip led channel 1: this led lights up whenever the amplifier clips. This is a warning sign: you are pushing things a little too far or you are overloading the amp. Reduce the input level by a few dB so that this led never lights up anymore ! Don't ignore this!
- 5) Temp led left channel: this led lights up when the amplifier is overheated. Output power will automatically be cut by the APC circuitry. This part of the protection circuit resets itself automatically when temperature has normalized. When both signal led (2) and temp led (5) are red, the power transformer's thermal protection is active and the amplifier is shut down. Turn off the power and let it cool down. **The amplifier will not turn on automatically after the transformer has cooled down, the user MUST turn off the power, remove the cause of the fault condition, wait for cooling down and then power on again!**
- 6) Bridge led: this led lights up to indicate that the amplifier is in bridge mode.
- 7) Power switch and power led: flip the switch to power on the amplifier. The blue led will light up to indicate that mains power is present.



- 8) Signal led channel 2: this led lights up green when a sufficiently strong signal is present on the left channel, after passing the input level control. At startup, the led will light up red during a few seconds, this is perfectly normal. When it lights up red during use, the power transformer or power amplifier is overheated or in protect mode and is shut down. Turn off the power. **The amplifier will not turn on automatically after most error conditions. In some cases, the user MUST turn off power and remove the overload and then power on again ! More details can be found in the table below.**
- 9) APC activity led right channel: this led lights up when the APC circuitry is active. The APC circuitry reduces the gain at the inputs to guarantee the full dynamic range of the power amplifier circuits.
- 10) Clip led channel 2: this led lights up whenever the amplifier clips. This is a warning sign: you are pushing things a little too far or you are overloading the amp. Reduce the input level by a few dB so that this led never lights up anymore ! Don't ignore this !
- 11) Temp led left channel: this led lights up when the amplifier is about to overheat. Output power will automatically be limited by the APC circuitry to avoid further overheating. This part of the protection circuit resets itself automatically when temperature has normalized. When both signal led (2) and temp led (5) are red, the power transformer's thermal protection is active and the amplifier is shut down. Turn off the power and let it cool down. **The amplifier will not turn on automatically after it has cooled down, the user MUST turn off power, wait for cooling down and then power on again ! More details can be found in the table below.**
- 12) Volume potmeter channel 2: use this potmeter to preset the volume. In bridge mode, this potmeter has no function.



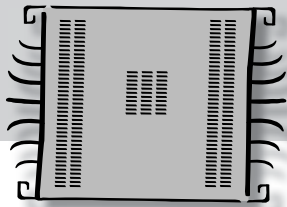


## Led status messages

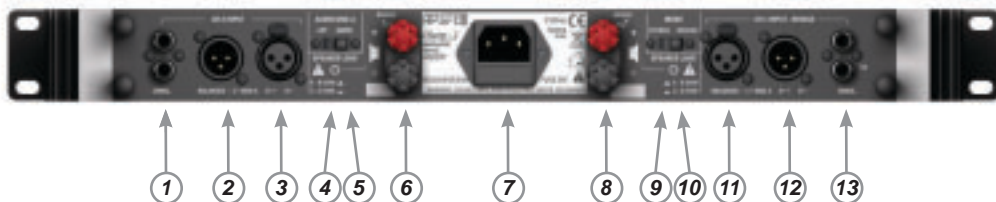
<b>Fault condition</b>	<b>SGL led CH1 = red</b>	<b>TEMP led CH1 = red</b>	<b>SGL led CH2 = red</b>	<b>TEMP led CH2 = red</b>	<b>What to do ?</b>	<b>Output signal condition</b>
<b>Ch 1 amp overheat</b>		Yes			Reduce input signal or check amplifier load. Wait for cool down.	No output
<b>Ch 2 amp overheat</b>				Yes	Reduce input signal or check amplifier load. Wait for cool down.	No output
<b>Ch 1 amp error (DC, HF, short circuit, overload)</b>	Yes				Switch off power and remove error. Leave switched off for at least 10 seconds. Switch power on.	No output
<b>Ch 2 amp error (DC, HF, short circuit, overload)</b>			Yes		Switch off power and remove error. Leave switched off for at least 10 seconds. Switch power on.	No output
<b>Transformer thermal protection</b>	Yes	Yes	Yes	Yes	Switch off power and wait for cool down*.	No output

*\*In case the transformer is overheated, it may take a long time before the amplifier has cooled down sufficiently. In such cases, you may have overloaded the amplifier too much. Power off the amplifier immediately, correct the error and wait until the amplifier has cooled down.*

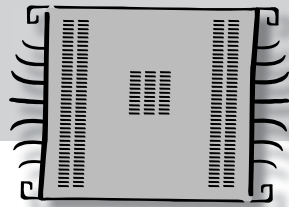
***Under normal circumstances, this amplifier will not overheat. If any of the above mentioned overheating situations occur, please check the load impedance, the ventilation and last but not least, input levels. The intelligent APC circuitry will reduce input gain and level to a safe margin within certain limits. This circuitry can not correct an input signal that is already clipped and distorted.***



Rear panel layout:



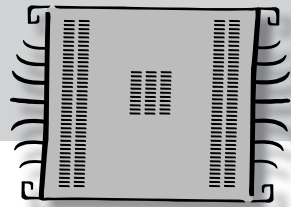
- 1) Channel 2 unbalanced input on cinch connectors: use the top or bottom cinch connector to apply an unbalanced signal on channel 2. These connectors are wired in parallel, this means you can use the second connector as a signal link connector.
- 2) Channel 2 balanced input on Neutrik XLR connector, this connector is wired in parallel to connector '3'. This allows you to link the balanced signal to another amplifier.
- 3) Channel 2 balanced input on Neutrik XLR connector, this connector is wired in parallel to connector '2'. This allows you to link the balanced signal to another amplifier.
- 4) Ground lift switch: use this switch to lift or connect audio ground to safety ground. This can be usefull in case of hum.
- 5) Speaker load impedance selector channel 2: set this selector correctly according to the actual load impedance. For 4 to 8 ohms applications: switch is not pushed in. For 2 to 3 ohm applications: push the button in. Please note that the impedance mentioned is the total load of the amplifier channel, this means that if you connect for example 3 speakers with 8 ohm impedance, you **MUST** push the button in because the load on the amplifier is  $8 : 3 = 2.7$  ohms. In case of bridge operation this button has no function. Use channel 1 impedance selector in case of bridge operation.
- 6) Channel 2 speaker binding post: this connector accepts speaker cable as well as 4 mm banana plugs. Remove the protective cover from the middle of the red/black binding post in case you want to use banana plugs. For bridge mode applications, you **MUST** use the red binding posts only: channel 2 red plug is bridge mode negative speaker connector.
- 7) Mains cable connector: plug the mains cable connector here, this socket also contains a mains fuse holder. Replace this fuse only with a 3 AT 250V type.
- 8) Channel 1 speaker binding post: this connector accepts speaker cable as well as 4 mm banana plugs. Remove the protective cover from the middle of the red/black binding post in case you want to use banana plugs. For bridge mode applications, you **MUST** use the red binding posts only: channel 1 red plug is bridge mode positive speaker connector.



- 9) Bridge mode switch: use this switch to convert the amplifier into a mono bridge amplifier. In this case you can apply an input signal to the channel 1 input only ! Leave the channel 2 connectors open ! Bridge mode input level is controlled by the channel 1 volume controller only. The 'BR' led on the front panel will indicate that the amplifier is in bridge mode. Minimum bridge mode speaker load is 8 ohms. Never use the speaker output –(minus) connectors in bridge mode !
- 10) Speaker load impedance selector channel 1: set this selector correctly according to the actual load impedance. For 4 to 8 ohms applications: switch is not pushed in. For 2 to 3 ohm applications: push the button in. Please note that the impedance mentioned is the total load of the amplifier channel, this means that if you connect for example 3 speakers with 8 ohm impedance, you MUST push the button in because the load on the amplifier is  $8 : 3 = 2.7$  ohms. Use channel 1 impedance selector in case of bridge operation. In case of bridge operation this switch must be put to 4-8 ohm operation because the minimum load impedance in bridge mode is 8 ohm. Less than 8 ohms in bridge mode is not allowed !
- 11) Channel 1 balanced input on Neutrik XLR connector, this connector is wired in parallel to connector '12'. This allows you to link the balanced signal to another amplifier.
- 12) Channel 1 balanced input on Neutrik XLR connector, this connector is wired in parallel to connector '11'. This allows you to link the balanced signal to another amplifier.
- 13) Channel 1 unbalanced input on cinch connectors: use the top or bottom cinch connector to apply an unbalanced signal on channel 1. These connectors are wired in parallel, this means you can use the second connector as a signal link connector.

### **What is bridge mode ?**

***In bridge mode, you can unite the power of 2 small amplifiers into 1 giant amp. The resulting power usually is more than double the power of both amplifiers used individually with the same load. There is a simple reason for this power boost: because the speaker load is wired to the channel's positive (hot) connectors, the amplifiers 'feel' half of the actual speaker's impedance. This means that, despite the fact that you connect for example an 8 ohm speaker, the amp thinks there is a 4 ohm load, resulting in higher power output per amplifier, and since both amplifiers work in bridge mode, this increased power is doubled. As a result, the minimum load impedance in bridge mode is limited to 8 ohms, because every amplifier only 'feels' half of this impedance. Set the speaker impedance selector of channel 1 to the 4-8 ohms position for 8 ohms(or higher) loads in bridge mode.***

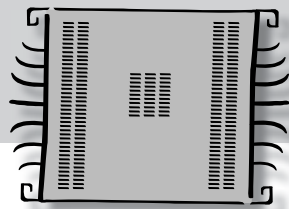


## **4. Rack mounting and wiring**

Champ-2 can be mounted in a 19" rack, taking up only 1 rack space. Always allow a good airflow around the amplifier's front, rear, side, top and bottom. When installing in a rack with multiple audio devices, it is compulsory to leave one rack space between units. Fill the empty rack spaces with meshed blind panels for improved ventilation. Never mount the amplifier in a sealed cabinet, unless adequate forced ventilation is provided. The amplifier may not be able to meet the specifications when installed in a poorly ventilated environment. Support the unit at the rear when installing in a rack !

**Always remember: excessive heat is one of your amplifier's biggest enemies !**

*When wiring an audio rack, it is a good installation practice to route all AC wiring along one side of the rack and all audio wiring along the other side to avoid coupling mains cable interference into the audio path. Please use only high quality signal and speaker cables and connectors. Pay special attention to avoiding ground loops when installing audio devices in metal racks, use special insulating rack mounting hardware, such as the so called 'humfrees'. This mounting hardware will make sure that several devices mounted in a rack will be electrically isolated from the rack, and thus are a great help in avoiding ground loops. Any damage caused by user induced ground loops are not covered by warranty ! Ground loops can cause hum or other strange side effects that will affect stable and safe operation of audio hardware and peripheral devices. Ground loops are often created by connecting tuners to cable distribution sockets. Use a RF isolating transformer whenever there is a cable signal tuner or digital TV tuner in the audio path !*

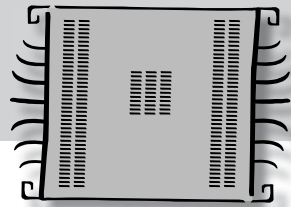


## **5. Standalone use**

It is possible to integrate Champ-2 in a high quality audio chain. In order to adapt the front panel dimensions to the dimensions of other equipment, it is possible to remove the 19" brackets and handles for an even more sleek and refined look.

Remove the two screws marked in red circles and slide off the handles.





## 6. Technical specifications

*Rated output power, both channels driven:*

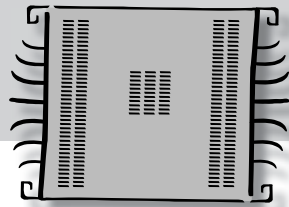
<b>Dynamic program power, both channels driven</b>	
Bridge-mono operation 8 ohm	750 W
2 channel mode 8 ohm	200 W / ch
2 channel mode 4 ohm	350 W / ch
2 channel mode 2.7 ohm	450 W / ch
Dynamic capacity at 2 ohm, both channels driven	600 W / ch

*\*a 2.7 ohm load can be seen as 3 pieces of 8 ohm speakers in parallel (or even 6 pcs of 16 ohm speakers).  
A 2 ohm load is technically possible but not recommended for long term use at high power.*

*Sine wave power, both channels driven (not recommended, for reference only)*

*This amplifier is designed for an audiophile music experience, not for lab testing!*

Bridge-mono operation 8 ohm	350 W
2 channel mode 8 ohm	120 W / ch
2 channel mode 4 ohm	180 W / ch
2 channel mode 2.7 ohm	200 W / ch



## General technical specifications

Input impedance / sensitivity unbalanced (RCA) / 4 ohm	10 Kohm / 1 V 0dBV
Input impedance / sensitivity balanced (XLR) / 4 ohm	20 Kohm / 1 V 0 dBV
Frequency response (0, -0.5 dB)	10 Hz – 50 kHz
THD	< 0.05 %
IMD	< 0.06 %
Noise	>100 DBA
Gain	30 dB (36 dB bridged)
Damping factor	> 200
Dynamics and level control	APC, switchable for 2-3 or 4-8 ohms
Power amp circuit design	High current, high voltage class G
Efficiency (dynamic program of 10 dB, 1 V input)	70 %
Protection circuits	DC, HF, clip, overcurrent, short-circuit
Temperature protection	95°C/ch + transformer 105°C
Cooling	convexional, no fan
Power consumption	15VA idle, 600VA full program, 1KVA peak
Mains power requirements	230VAC, 50Hz

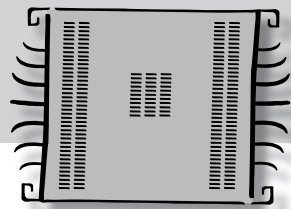
## Physical specifications

Net dimensions (cm) (W x H x D)	48.3 X 4.4 X 36
Gross dimensions (cm) (W x H x D)	56 x 10 x 55
Net weight	7.5 kg
Gross weight	9.0 kg

### APart-Audio general warranty conditions:

APart-Audio warrants this product to be free of defects in material and workmanship for a period of one\* year for parts and for a period of one\* year for labor from the date of original end-user purchase. This warranty is valid only for the original end-user and cannot be transferred.

During the warranty period APart-Audio or one of its authorized service partners shall either repair or replace any product, free of charge, that proves to be defective on inspection by APart-Audio or its authorized service representative.



**ANY SUGGESTION?**

***They are well appreciated and eventually rewarded!  
Send your ideas or suggestions to***

***suggestions@apart-audio.com***

*Company names, product names, and names of formats etc. are the trademarks or registered trademarks of their respective owners.*

*© 2008 APart-Audio specifications subject to change without notice.*

**CHAMP-2 is developed by**

**Audioprof nv  
Lanteernhofstraat 90  
BE-2100 Deurne  
BELGIUM**

