

**audioplan**

**Operating instructions**

**experience music**

## Dear Audioplan customer,

You have decided to purchase one of our power supply products. We thank you for the trust you have placed in us.

In order to be able to exploit the full potential of the devices, to avoid damage and to achieve the best possible sound, please observe the following important instructions.

1. **The Audioplan power supply units should only be connected with the hifi-system switched off.**
2. **Observe the maximum permissible load capacity of the filter modules. Overloading can lead to damage and overheating.**
3. **Do not open the units. Mains voltage is running inside. This is dangerous to life. High voltages can be stored in the unit for a few minutes even after disconnection from the mains. There are no parts inside the filters that can be replaced by the user. The fuses are accessible from the outside.**
4. **Disconnect the unit from the mains before replacing the fuse! Always replace with the same type and value. The value is printed on the respective unit. Never use stronger fuses as they might damage the unit.**
5. **Place the units on a firm, dry surface, e. g. behind the hifi-rack on the floor. At most the units become hand-warm during operation. Special ventilation is therefore not necessary.**
6. **Avoid contact of the units with water. Penetrating water can cause short circuits and damage to the filters. In such a case, please contact your dealer.**
7. **The Audioplan filter units may only be used in closed, dry rooms for the operation of an audio, video or audio-visual system. All other uses are not permitted and may be dangerous. Audioplan is not liable for damage caused by improper use or incorrect operation.**

## The Audioplan power supply, a system of complementary devices.

### Why are there different power supply units and what is their function?

If you look at an audio or AV system consisting of several components, you can distinguish between three basic types of unwanted interaction. Each of them requires a specific countermeasure.

### 1. Dynamically changing potential differences caused by the current distribution to the individual components of the hifi-system:

If the devices of a hi-fi system are connected to a conventional distributor or different sockets in a room or, even worse, to different power circuits in the house, dynamically fluctuating potential differences are unavoidable due to the internal resistances of the cables. These potential differences lead to compensation currents on the signal lines between the units. To reduce these to a theoretical minimum we have developed the PowerStar. Since with the PowerStar all connected units in the outer sockets refer to the unit in the central socket in terms of potential, there are practically no more compensation currents.

### 2. Interference caused by devices in the AV system itself, we call it internal interference:

All devices generate mains-noise themselves and thus influence each other. Ideally, all devices of a system should be filtered separately, to remove this interference. For a gradual build-up of the filter chain, it is recommended to filter the strongest interferers first. Switch-mode power supplies and digital devices produce particularly unpleasant interference. To prevent their interference from reaching the other units of the hi-fi system, we developed the PowerPlant. The PowerPlant is therefore the basic filter for CD players, D/A converters and other digital components. Next, the phono stage, the record player and the preamplifier should be equipped with the PowerPlant for additional filtering. Finally the power amplifier(s) or integrated amplifier shall be filtered with PowerPlant.

### 3. Interference from outside, from the mains, we call it external interference:

This noise enters the system via one or more mains supply cables. Since the relevant interference for the sound-quality is high-frequency, the noise can spread throughout the entire system via the signal cables or their earth connection. Therefore, the ideal solution is to have all components of the system separated from the mains by a filter. This requirement can be met by separate filters for each component.

## The Audioplan power supply

### 4. The importance of mains cables: Often underestimated!

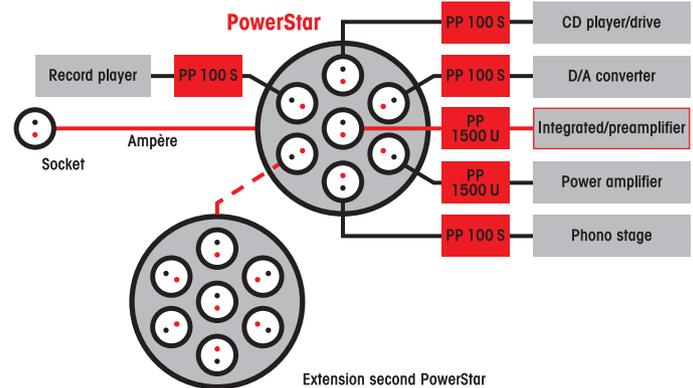
Mains cables, like all components at the beginning of the transmission chain, have a decisive influence on the sound quality. That is why we have designed Ampère in such a way that the construction and material mix allow high-frequency interference to be filtered out without compromising the dynamics of the reproduction. We deliberately do not use components in the cable, ferrites, electrostatic or magnetic shields, as they have all been shown to reduce the dynamic range and to colour the sound. Ampère is designed such that the pulsed currents reach the component undamped. HF noise however is reduced. In terms of sound, this results in a clean, clear and smooth reproduction, natural timbres and a stable three-dimensional presentation and focus of sound-sources. For units that are not operated via a PowerPlant, Ampère provides a very effective filtering.

### The interplay of Audioplan power supply units.

The units described here form a filter system that takes into account all relevant effects when connecting several components to the mains. Since the filter modules complement each other in their effect, there is no over-filtering. This also applies to those AV components that are already equipped with a mains filter. This filter usually serves to comply with the CE regulations and is not optimised for sound quality. If the built-in filter is no longer exposed to the mains-noise, by means of Audioplan filtering, the sound of these AV components is much improved, often above average. With the Audioplan filter modules, you have an outstanding system at your disposal that solves all filtering tasks and can be perfectly adapted to your system, as it is modular.

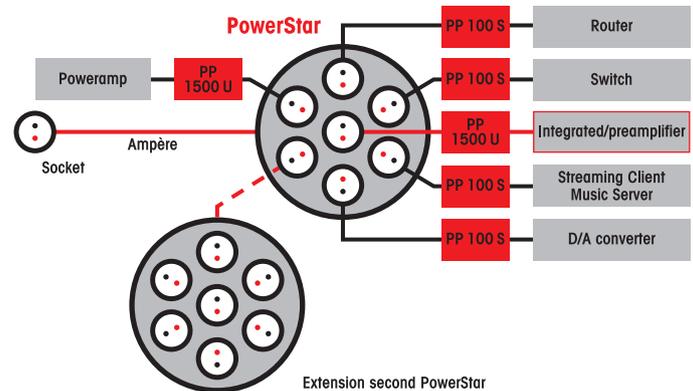
## The Audioplan power supply

### Typical HiFi system with fully developed Audioplan mains filtering



**Note:** All cables between PowerPlants and equipment: Ampère.

### HiFi-System with Streamer/Music-Server



**Note:** All cables between PowerPlants and equipment: Ampère.

## PowerPlant 100 S

All units of a hi-fi-system generate mains noise which influences the sound-quality. They should be isolated from the other units in the system by means of PowerPlant. For this purpose, the PP 100 S has a particularly high backward attenuation, which prevents the propagation of these interferences back into the mains. Furthermore, the PP 100 S filters out high-frequency noise from the mains and removes DC, which can lead to hum from transformers.

### Installation and connection

The PP 100 S can be positioned on the floor behind the hi-fi-system. Please note that surfaces that are highly susceptible to vibrations, such as shelves or floating wooden floors may cause a slight mechanical hum. As a countermeasure, a decoupled installation is recommended in these cases, e.g. by using a soft underlay. Experience has shown that interconnect or loudspeaker cables laid directly near the PP 100 S are not disturbed. However, a small distance of 10–20 cm can bring sonic advantages. The transformers for MC cartridges should be placed a little further away; we recommend about 50 cm. The PP 100 S is connected to the mains with its captive lead. Please watch that the red lightning on the plug should be connected to the "hot" or "live" cable of the mains. The output socket also has a red dot to mark the pole that carries "live" voltage.

### Load capacity

It is essential to observe the maximum load capacity, especially for the PP 100 S. This is indicated on the type plate. The PP 100 S can supply practically any source device (CD player, D/A converter, phono stage, etc.), but it is unsuitable for larger loads such as integrated amplifiers, power amplifiers, subwoofers or large televisions. For this purpose, there is the Power Plant 1500 U.

### Overload protection

The PP 100 has thermal overload protection. At permanent overload of approx. 1.5 times, the unit is automatically switched off. After cooling down, the unit switches itself on again automatically. In this case, reduce the load to the permissible level to avoid damage and to achieve the best sound quality.

### Options for connecting the PowerPlant

The best sound quality is achieved when only one load is connected to a PP 100 S. This way, the devices to be filtered cannot interfere with each other. However, it is also permissible to distribute power behind the PP 100 S, as long as the maximum permissible load is not exceeded. In accordance with VDE (the German safety rules, please watch the regulations in your country!), a 3-pole (with separate ground con-

## PowerPlant 100 / PowerPlant 1500 U

nection) distributor and 3-pole cables must be used. The safety guidelines are complied with when using a PowerStar and Ampère cables. If ground loops are a problem in your installation, the PP 100 S can be converted to earth-free operation. This conversion may only be carried out at the factory. This is possible according to the VDE guidelines as the PP 100 S enables galvanic mains separation and maintains the necessary insulation voltage. Please ask for advice in advance from Audioplan or your dealer.

**Note:** In addition to the filter effect for high frequencies, DC components are removed from the mains. The output voltage of the PP 100 S, independent of the mains voltage, no longer contains any DC component.

## PowerPlant 1500 U

For the placement of the PP 1500 U, the same guidelines as for the PP 100 apply. In addition to the features of the PP 100 S, the PP 1500 U has a power switch. If it is switched off, about 20W of loss power can be saved. Please note that due to its high power reserves, the PP 1500 U has a considerable inrush current, which occasionally triggers fast acting circuit breakers. For sound reasons, we have nevertheless dispensed with an inrush current limiter. We recommend the installation of a melting fuse instead. If this is not possible, a 16A automatic circuit breaker with a slow-blow characteristic (C 16A) will also meet the requirements.

### Outputs of the PowerPlant 1500 U

The PP 1500 U has two switchable outputs, which can only be used alternatively. On the one hand, there is an unearthed output with galvanic mains isolation that is activated via the lower switch position. This output is ungrounded, which avoids hum loops. The "hot" or "live" pole is marked. It should only be used if hum problems due to earth loops occur with a direct mains connection. On the other hand, there is an earthed output with phase compensation, which is used in all other cases. The output has no fixed assignment of the mains "hot" pole and is therefore not marked!

### Adjusting the phase compensation

The phase compensation allows for the compensation of different potentials on the earth lines. Compensating currents on the signal lines are thus avoided. For this purpose, the ground-potential of the device connected to the PP 1500 U must be brought to earth potential. First disconnect all connection cables from the unit to be adjusted. If the unit is earthed (3-pole cable), the unit must be connected ungrounded for the measurement, e.g. with an appropriate adapter cable. Plug the unit

## PowerPlant 1500 U / PowerStar

into the measuring adapter and switch it on. Set the meter to "V AC" and connect one cable of the meter with GND (outer contact of an RCA-socket or the enclosure) of the device. Use the other measuring cable to contact an earth point, e.g. on the PowerStar or the earth contact of a wall-socket. Unlock the two setting controls on the PP 1500 U by pushing the sliding buttons on the right side of the control housings upwards. Now bring the lower fine-adjustment knob to approximately the middle position. This gives room for fine adjustment in both directions when the coarse adjustment is done. Now turn the coarse adjustment knob until the meter shows the lowest possible voltage (typically between 2V and 5V). You can be a little bit off the optimum, because there is still the fine adjuster! When the setting is close to the minimum voltage, lock the coarse control by pushing the lock down. Now make the fine adjustment with the lower control. Please note that the meter does never indicate „0V“. There will be a small residual voltage of approx. 0.8V to 20V, which cannot be compensated. After optimisation is complete, also lock the fine controller to secure it against unintentional adjustment. Now switch off the optimised unit, remove the measuring adapter and connect the mains plug of the unit directly to the PP 1500 U with the same polarity. A device with a 2-pole mains connection without earth is connected directly to the PP 1500 U without a measuring adapter and can be adjusted as described above. Measurements are taken from a GND point on the unit to be adjusted to an earth point (earthed socket or PowerStar). Again, the unit to be adjusted must be switched on and all signal lines disconnected to achieve correct results. After adjustment is complete, switch off the unit and re-establish the signal connections.

## PowerStar

The PowerStar is used for the potential-optimised distribution of the mains current in your system.

### Preparation

Please make sure that the feet of the PowerStar S are in full contact with the bottom of the unit. However if the feet are too tight the sound becomes too bright and forward. Therefore, please tighten the feet only slightly!

### Connection

If you have ordered a PowerStar with an Audioplan mains cable, the phase is indicated by a red lightning bolt on the mains plug of the cable. Please plug it into the wall socket in such a way that the phase („hot“ or „live“ pole of the mains socket, phase tester lights up) is at the red marking. The output sockets of the PowerStar are marked accordingly with a red dot for

## PowerStar / Ampère

the "live" contact. This way units tested for minimal ground potential can be connected with the correct phase without further measurement. How to measure minimal ground potential of your units is explained in the chapter „Measuring the ground potential of the units“. When connecting the devices to the PowerStar, it is important that the central device of your system is connected to the central socket of the PowerStar. In a hi-fi system, this is the preamplifier or the integrated amplifier. In an AV system, the central device is the AV-amplifier. The sockets in the outer circuit all are equal. All other devices of your system can be connected in any order. The important thing is that all devices that are connected to the hi-fi system are also centrally supplied with current by the PowerStar. In a complex system with more than seven units, it is best to work with two PowerStars. In a HiFi-system, the additional PowerStar is best used to power auxiliary equipment and other source devices, while the main system with the most important signal source is connected to the first PowerStar. In an AV system, it is best to work with a second PowerStar for the video devices, which is plugged into the outer circuit of the first PowerStar.

### Additional grounding

If you would like to provide a unit with an additional ground, a wire can be connected to the green-yellow binding post of the PowerStar. This binding-post is connected to the central earth point of the PowerStar.

## Ampère

The Ampère mains cable is supplied with a Schuko mains plug (or a plug for your country) and an IEC C13 or C19 plug as standard. Other connectors or variants for installation in units are available on request. The Ampère mains cables are marked with a red lightning bolt on both plugs in order to facilitate the "phase-correct" connection of the devices connected to it. The lightning bolts indicate contacts of the two plugs that are connected to each other. The cable itself has no preferred orientation with respect to the "hot" and the "cold" pole, the construction is symmetrical. The orientation of the lightning bolts is in accordance with the IEC guidelines for the respective plug type. If you do not have a technician or trained dealer, that can measure your equipment to the instructions given below, it is best to estimate, that the unit is connected according to the IEC-standard. That means, the lightning bolt shall be connected to the "hot" or "live" contact of the supply-socket. However, this does not make sure that the "mains phase" of the unit is correct. Many manufacturers are not aware of the importance of the mains phase or simply ignore the IEC recommendation. The correct phase of the unit can be determined by measuring the ground potential of the unit. If the correct phase position of the unit does not correspond

## Ampère

to the cable marking, the mains plug must be plugged in „turned“. This is only possible for symmetric plugs like the German Schuko plug. For other types the wires need to be exchanged internally. This should only be made by a qualified and trained technician! See warning below!

### A note on cable length

The standard length of 1.5 m represents the shortest recommended length for the Ampère cables. Shorter runs are possible but tend to sound „lighter“ and more forward. The reason is that the filter effect of the cable depends on the length. Longer cables are therefore not only uncritical, they also have a greater filtering effect which is beneficial for the sound as this filtering effect comes without disadvantages in terms of dynamics. The lower midrange sounds somewhat fuller, the colours are more natural, the sound is more three-dimensional and relaxed. This is especially true for the Ampère S when connected to digital equipment. The Ampère L has roughly double the filtering effect of the Ampère S.

### Measuring the ground potential of components

#### LIABILITY/SAFETY WARNING

Audioplan accepts no responsibility for damage to property or personal injury resulting from attempting to make the measurement described herein. These instructions are only for trained electricians who are familiar with the safety standards and laws of their country. Do not make any changes to mains cables, sockets, devices or connectors if you do not have electrical engineering training. Mains voltage is dangerous and can kill you.

#### ATTENTION /SAFETY WARNING

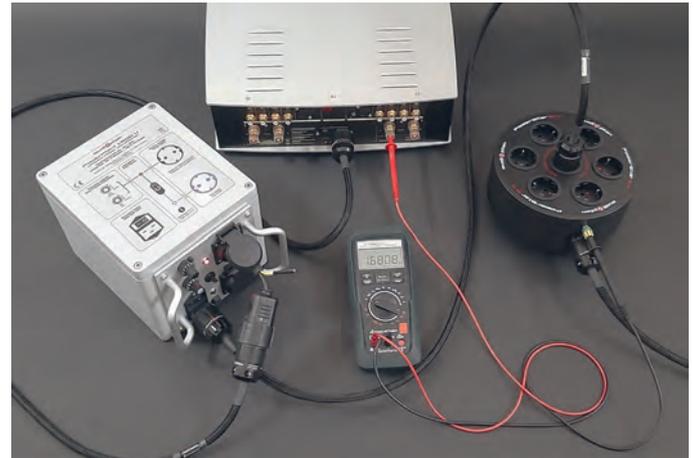
For the measurement of earthed units the earth connection to the unit must be disconnected or insulated, otherwise no measurement is possible. In our experience, scotch tape does not work as insulation, it tears when plugged in and there is again an earth contact between the unit and the mains socket. No valid measurement is possible in this case, the measured voltage will be close to zero volts. The most suitable approach is to use a measuring adapter consisting of a socket and a mains plug, which do not have a continuous earth connection. Please leave this work to qualified persons. Mains voltage is life-threatening, an interrupted protective earth conductor cannot protect you in the event of a device fault to touch potentially lethal mains voltage.

#### Measurement:

The correct mains phase – the contact that carries „live“ to the unit – is very important for the sound, because it determines the level of the compensation currents on the signal lines caused by different „ground potential“.

## Ampère

Therefore the minimal ground potential depending on the plug position in the wall-outlet (this is only possible with a Schuko-plug which is symmetrical) of all units of a system should be measured with a high-impedance voltmeter (at least 10 MOhm internal resistance). First check the position of the hot wire in the wall socket with a phase tester (i.e. a screwdriver with neon lamp). Mark the socket on the side where the neon glow lamp is lit. Each unit must be connected individually to this marked socket with a multimeter in the V AC or ~ position. When doing this, all connecting cables to other devices must be disconnected. Switch on the unit and measure the AC potential between the ground terminal or the enclosure or signal ground of the unit and the mains earth contact of a wall socket. Now turn the mains plug in the wall socket or use a test cable with inverted polarity and measure again. The smaller measured AC voltage determines the correct „phase position“. Since the „hot“ side of the wall socket is known, you can now mark the mains plug of the unit accordingly.



Measurement setup for adjusting the compensation on the PowerPlant 1500 U. The amplifier is connected to the PowerPlant (adapter shown on PowerPlant 1500 U to break the ground-connection) and switched on. Measurement instrument (set to volts AC) is connected between a signal-ground-contact of the unit (here: red cable is connected to the black terminal of loudspeaker output) and mains earth (here: black cable is connected to the earth terminal of the PowerStar).

The logo for audioplan, featuring the word "audioplan" in a white, lowercase, sans-serif font. The letter "o" is replaced by a red circle with a white outline. The background is a dark, textured surface with a repeating woven or basketweave pattern. A white L-shaped graphic element is positioned in the top-left corner.

audioplan

The contact information for audioplan, including the company name, address, phone number, email address, and website. The text is in a white, sans-serif font. A white L-shaped graphic element is positioned in the bottom-left corner.

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