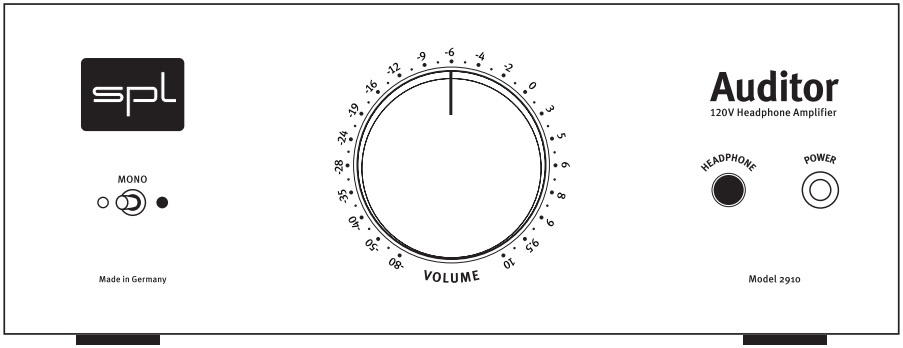
Manual



Auditor

Model 2910

120 volts headphone amplifier

Version 1.0 – 5/2009

Designer: Wolfgang Neumann

This user's guide contains a description of the product. It in no way represents a guarantee of particular characteristics or results of use. The information in this document has been carefully compiled and verified and, unless otherwise stated or agreed upon, correctly describes the product at the time of packaging with this document.

Sound Performance Lab (SPL) continuously strives to improve its products and reserves the right to modify the product described in this manual at any time without prior notice. This document is the property of SPL and may not be copied or reproduced in any manner, in part or fully, without prior authorization by SPL.

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CE Declaration of Conformity

Manufacturer: SPL electronics GmbH, Type of Equipment: Audio Signal Processor, Product: Auditor, Model 2910, Compliance Engineer: Wolfgang Neumann

Test Basis: EN50081-1:1992, EN50082-1:1992, EN60065:1993, EN61000-3-3:1995, EN60065:2002, EN55013:2001, EN55020:2002, EN61000-3-2:2000, 73/23 EWG; 93/68 EWG. We herewith declare, that the construction of the Auditor, Model 2910, is in compliance with the standards and regulations mentioned above.

Notes on Environmental Protection

At the end of its operating life, this product must not be disposed of with regular household waste but must be returned to a collection point for the recycling of electrical and electronic equipment. The "wheelie bin" symbol on the product, user's manual and packaging indicates that. The materials can be re-used in accordance with their markings. Through re-use, recycling of raw materials, or other forms of recycling of old products, you are making an important contribution to the protection of our environment. Your local administrative office can advise you of the responsible waste disposal point.

WEEE Registration: 973 349 88

Content

Symbols and Notes

IN THIS MANUAL A LIGHTNING SYMBOL WITHIN A TRIANGLE WARNS YOU ABOUT THE POTENTIAL FOR DANGEROUS ELECTRICAL SHOCKS – WHICH CAN ALSO OCCUR EVEN AFTER THE MACHINE HAS BEEN DISCONNECTED FROM A POWER SOURCE.

AN EXCLAMATION MARK (!) WITHIN A TRIANGLE IS INTENDED TO MAKE YOU AWARE OF IMPORTANT OPERATIONAL ADVICE AND/OR WARNINGS THAT MUST BE FOLLOWED. BE ESPECIALLY ATTENTIVE TO THESE AND ALWAYS FOLLOW THE ADVICE THEY GIVE.

The symbol of a lamp directs your attention to explanations of important functions or applications.

Attention

Do not attempt any alterations to this machine without the approval or supervision of SPL electronics GmbH. Doing so could nullify completely any and all of your warranty/guarantee rights and claims to user support.

Scope of Delivery and Packaging

- Auditor, Model 2910
- Power cord
- Guarantee card
- This manual

Please keep the original packaging. In case of a service procedure the original packaging ensures a safe transport. It also serves as a safe packaging for your own transports if you do not use special transportation cases.

Please note and retain this manual. Carefully read and follow all of the safety and operating instructions before you use the machine. Be doubly careful to follow all warnings and special safety instructions noted in this manual and on the unit.

Connections: Only use the connections as described. Other connections can lead to health risks and equipment damage.

Water and humidity: Do not use this machine anywhere near water (for example near a wash basin or bath, in a damp cellar, near swimming pools, or the like). In such cases there is an extremely high risk of fatal electrical shocks!

Insertion of foreign objects or fluids: Never allow a foreign object through any of the machine‘s chassis openings. You can easily come into contact with dangerous voltage or cause a damaging short circuit. never allow any fluids to be spilled or sprayed on the machine. Such actions can lead to dangerous electrical shocks or fire!

Opening the Unit: Do not open the machine housing, as there is great risk you will damage the machine, or – even after being disconnected – you may receive a dangerous electrical shock!

Electrical power: Run this machine only from sources which can provide proper power at the prescribed rating. When in doubt about a source, contact your dealer or a professional electrician. To be sure you have isolated the machine, do so by disconnecting the power cord from your wall connection. Be sure that the power cord plug is always accessible. When not using the machine for a longer period, make sure to unplug it from your wall power socket.

Power cord protection: Make sure that your power cord is arranged to avoid being stepped on or any kind of crimping and damage related to such event. Do not allow any equipment or furniture to crimp this power cord.

Power connection overloads: Avoid any kind of overload in connections to wall sockets, extension or splitter power cords. Always keep manufacturer warnings and instructions in mind. Overloads create fire hazards and risk of dangerous shocks!

Lightning: Before thunderstorms or other severe weather, disconnect the machine from wall power (but to avoid life threatening lightning strikes, not during a storm). Similarly, before any severe weather, disconnect ALL the power connections of other machines and antenna and phone/network cables which may be interconnected so that no lightning damage or overload results from such secondary connections.

Important Security Information

Air circulation: Chassis openings offer ventilation and serve to protect the machine from overheating. Never cover or otherwise close off these openings. never place the machine on a soft surface (carpet, sofa, etc.). Make sure to provide for a mounting space of 4-5 cm/2 inches to the sides of the unit when mounting the unit in racks or cabinets.

Controls and switches: Operate the controls and switches only as described in the manual. Incorrect adjustments outside safe parameters can lead to damage and unnecessary repair costs. Never use the switches or level controls to effect excessive or extreme changes.

Repairs: Unplug the unit and immediately contact a qualified technician when you think repairs are needed – or when moisture or foreign objects may accidentally have gotten in to the housing, or in cases when the machine may have fallen and shows any sign of having been damaged. This also applies to any situation in which the unit has not been subjected to any of these unusual circumstances but still is not functioning normally or its performance is substantially altered.
In cases of damage to the power cord or its plug, first consider turning off the main circuit breaker before unplugging the power cord.

Replacement/substitute parts: Be sure that any service technician uses original replacement parts or those with identical specifications as the originals. Incorrectly substituted parts can lead to fire, electrical shock, or other dangers, including further equipment damage.

Safety inspection: Be sure always to ask a service technician to conduct a thorough safety check and ensure that the state of the repaired machine is in all respects up to factory standards.

Cleaning: In cleaning, do not use any solvents, as these can damage the chassis finish. Use a clean, dry cloth (if necessary, with an acid-free cleaning oil). Disconnect the machine from your power source before cleaning.

Power Connection

Be very careful to check that the rear chassis power selection switch is set to the correct local line voltage position before using the unit (230 V position: 220-240 V/50 Hz, 115 V position: 110-120 V/60 Hz)! When in doubt about a source, contact your dealer or a professional electrician.

Before connecting any equipment make sure that any machine to be connected is turned off. Follow all safety instructions on page 5 and 6.

Placement

Place the unit on a level and stable surface. The unit's enclosure is EMC-safe and effectively shielded against HF interference. Nonetheless, you should carefully consider where you place the unit to avoid electrical disturbances. It should be positioned so that you can easily reach it, but there are other considerations. Try not to place it near heat sources or in direct sunlight, and avoid exposure to vibrations, dust, heat, cold or moisture. It should also be kept away from transformers, motors, power amplifiers and digital processors. Always ensure sufficient air circulation by keeping a distance of 4-5 cm/2 inches to the top and sides of the unit.

Before You Begin

Make sure that the POWER SOAK control is turned fully left before you power up the unit. Now control volume. Note that too high levels can damage connected units and hearing!

There is more than meets the eye in working with headphones. A reason for this surely lies in that modern audio production often necessitates decentralized processes. In turn, production phases following such plans more often take place in acoustically questionable rooms. In such circumstances, a mix might occur in an acoustically deficient ambiance (for example, in an extremely modal room), and employing headphones then begins to make sense when a successful mix would otherwise turn out to be impossible.

Acoustic Magnifier

But also when working with full range monitors in the studio, headphone monitoring is an extremely important alternative to loudspeaker monitoring: analytical monitoring via headphones offers a very high precision to observe details. Headphone monitoring is like working with an acoustic magnifier, excluding external room influences. Working with the magnifier effect of headphones has the advantage of safely hearing clicks or similar defects and helps in fine tuning crossfades or to judge tonal problems in individual tracks.

120 Volts Technology

The Auditor is our interpretation of a high-end headphone amplifier. We strictly followed a purist approach to achieve the highest sound quality. The alternative to the Auditor is the full-featured headphone monitoring amplifier Phonitor. Based upon our unique 120 volts design as well, the Phonitor transfers the essential ambient parameters of loudspeaker monitoring to the headphone monitoring.

The basis for such high-end developments is our proved 120 volts reference technology. Core elements are the handmade SPL SUPRA opamps running on 120 volts – it corresponds to approximately twice that of most modern analog audio semiconductor technologies. Through such 120 volts circuitry and processing we reach performance levels far beyond conventional designs in dynamic range and distortion levels, and such technical specifications exceed all known analog or digital standards.

The End of Ear Fatigue

With headphones, ear fatigue can begin relatively soon, and there are several causes.

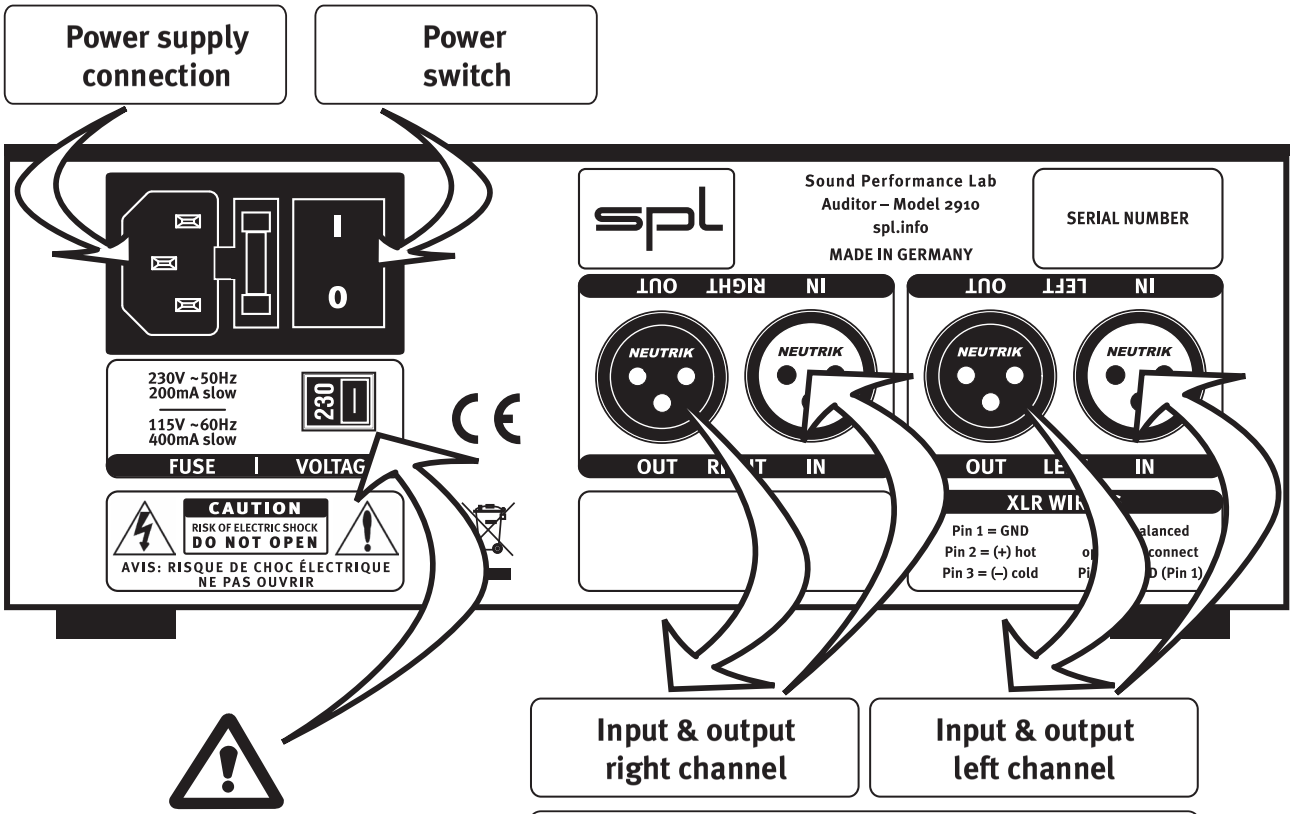
First, some cans themselves may not be that comfortable to wear... Moreover, a standard headphone amplifier is often an additional important reason for premature ear fatigue. Almost without exception, present-day headphone amplifiers employ comparatively undemanding IC's. In the best cases they might work with symmetrical voltages of +/-15 V to +/-18 V, and in less favorable cases, with only a simple supply of 9 or 12 V from cheaper external "wall-wart" power supplies.

But the voltage level acts in circuitry much like the cubic inch capacity to the productive power of a combustion engine: Cubic inch capacity is replaceable with nothing but more cubic inch capacity – and in the productive power of electronics, voltage level functions similarly.

For some years, now, SPL has addressed this issue in all of its mastering product series through its own specifically developed 120 volt technology. Consoles and signal processors of the SPL Mastering Series appear as central elements in installations of today's most renowned mastering houses (e. g. Bob Ludwig's Gateway Mastering & DVD in the USA, Simon Heyworth's Super Audio Mastering in Great Britain or the Galaxy Studios in Belgium). This 120 volt technology is based on discrete operation amplifiers from SPL's own production, developed and perfected over many years by SPL's co-founder and chief developer, Wolfgang Neumann. The SUPRA OPs have a signal to noise ratio of 116 dB and offer a 34 dB headroom – that yields an unequalled 150 dB dynamic range.

The musical result is not to be mistaken: Regardless of the monitoring means, regardless of how loud you monitor – the Auditor always remains a distant, impartial factor unaffected when used to capacity and beyond being overloaded. The phase stability is always perfect, its THD next to immeasurable. The SUPRA OPs cannot be stressed in the most stressful circumstances, and for precisely this reason its musical sound is always relaxed and spacious. All frequencies are reproduced in balance, basses are stable and tight, mids are clear and differentiated and highs remain transparent and soft.

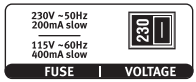
Such supreme and heretofore unreachable neutrality in audio reproduction is the direct consequence of our technical approach and basis in 120 volt technology: Possible disturbances from such as noise or distortion are so slight that we even arrive at the boundaries of the best measuring equipment, and what remains is quite simply unaltered musical sound.



Make sure that the voltage switch setting reflects the correct local power line voltage.

The Auditor can be fed from any stereo signal path via its rear panel XLR sockets. Headphone connection on the front panel.

Voltage



The rear panel voltage selector switch serves to let the user switch to the local line voltage standard.

IMPORTANT ADVICE: Before you use the Auditor, make sure that this switch setting reflects the correct local power line voltage (115 V position: 110-120 volts/60 Hz, 230 V position: 220-240 volts/50 Hz).

Power Connection and Fuse

Connect the included power cord to the rear power supply socket.

Transformer, power cord and case connection conform to VDE, UL and CSA requirements. The power fuse is installed behind the clack right to the power connector. Power fuse ratings are 200 mA slow blow (220-240 volts) or 400 m A slow blow (110-120 volts).

On/Off Switch

The rear panel On/Off switch activates the unit, confirmed by the lighted POWER LED on the front panel.

IMPORTANT ADVICE: Switch on the unit only after you have turned the Volume control fully left, and wait to set your desired volume level until the unit is powered on. Neglecting this can damage either or both your ears and your headphones!

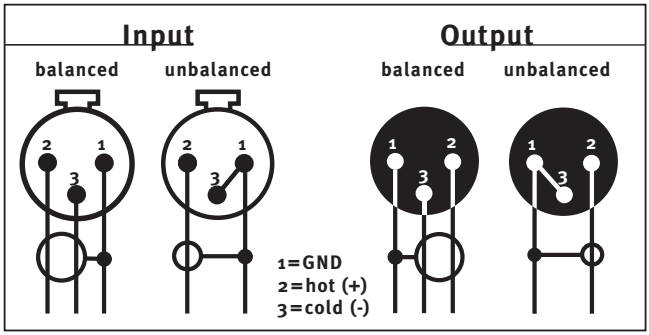
XLR Connections

Switch off the unit before you begin the process of making the first or any subsequent connections (rear panel On/Off switch). Neglecting this can damage either or both your ears and your headphones!

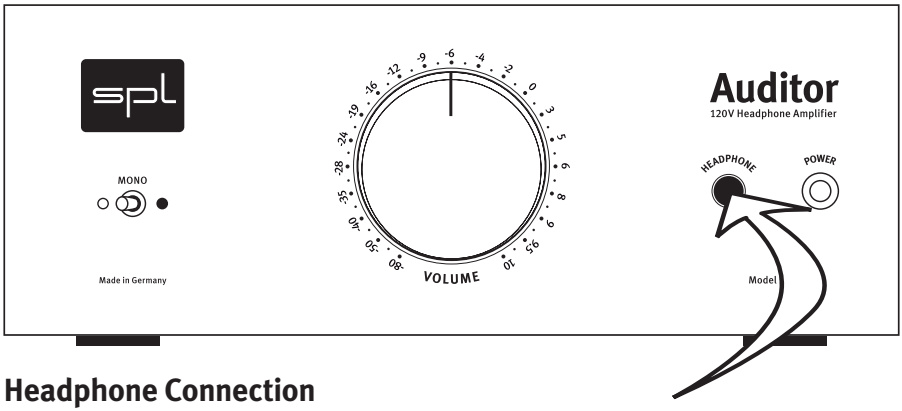
Connect the monitoring signal to the left and right channel XLR input sockets. Both XLR outputs transmit the monitoring signal unaltered so that no additional monitoring output is needed for insertion of the Auditor. Input and output stages are electronically balanced. They ensure high common mode rejection and drive long cable connections (depending on cable capacities and following input stages).

Unbalanced Connections (e. g. RCA, TS Jack)

You can establish unbalanced connections easily and without adaptors – for example from CD-Players with RCA outputs or to (HiFi) power amplifiers with RCA inputs. It is important to pay attention to the correct polarity of the three XLR wires. The diagram shows the pin wiring of all XLR sockets as well as the correct polarity for unbalanced connections:



Connections to RCA and TS Jack inputs or outputs are always unbalanced. Connections to TRS inputs or outputs may be balanced or unbalanced. In any case we recommend to use readily configured cables from XLR to the respective RCA or TS/TRS connector to dispense with adaptors. Ask your dealer for configured cables. With the diagram above any audio expert can ensure to select or configure the right cables for connections from the Auditor to any other device.



Headphone Connection

You can use all dynamic headphones from 20-600 ohms (connection impedance). Connect your headphones to the standard 1/4" (TRS) stereo jack plug on the front panel. Make sure that the plug is firmly seated for a solid connection.

Pin wiring TRS jack: Tip=left channel, ring=right channel, sleeve=ground.

Recommendations

Unplug the headphone when you switch off the Auditor. Otherwise discharging residual voltages can cause beeping sounds. We did not add a circuitry to avoid that phenomenon because it would compromise sound quality.

Reduce volume level before you remove or plug in the headphone (or when switching headphones). This excludes louder clicks and pops reaching the ear. In addition, this can avoid unpleasant surprise that follows when a headphone's lower impedance suddenly reproduces an otherwise acceptable Auditor volume setting of a first headphone at a much higher – even painful – level.

Warning

NEVER plug in a mono 1/4" jack (TS) to the headphone output. The use of a mono 1/4" will lead to a short-circuit that will destroy the final amplifier stage! Standard headphone connectors always have stereo plugs, and thus a correct connection will be assured when you only connect headphones directly. Double check that you use stereo 1/4" TRS plugs when you connect headphones via patchbays or extension cables etc.

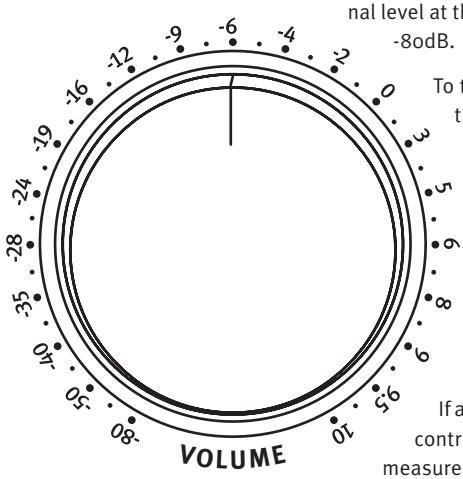
Usually already a short contemplative moment should be sufficient to get a general idea of the Auditor's user interface and it's control elements. Once more the advantages of a consequently purist design approach are becoming obvious – writing and reading the actual operational instructions just takes two beats.

Mono

The MONO switch creates a sum of the left and right channel, so you can listen to stereo sources also in mono. You can also listen to a mono source on both monitoring channels. The MONO switch is of course also important and useful to examine the mono compatibility of a mix. Phase alterations or reversions that may not be too obvious in the stereo panorama can be detected more clearly in a mono sum – in extreme cases they lead to cancellations.

Volume

The VOLUME level control allows you to increase or decrease the signal level at the headphone output from between +10dB down to -80dB.



To this end we employ a high-grade ALPS RK27 potentiometer. It distinguishes itself through a high headroom, very low tolerance and excellent handling that on the one hand offers sufficient resistance while, on the other, avoids stickiness.

The VOLUME control is calibrated in a relative dB scale that references the input level. The odB setting is around the two o'clock position, where the input signal is led to the output with an unaltered level (unity gain).

If a 600 Ohms headphone is connected, a 0dB VOLUME control setting results in ca. 80dB sound pressure level, measured at a distance of 3cm from a headphone transducer. With a stereo signal the sound pressure level is then at ca. 83dB – a common reference monitoring level.

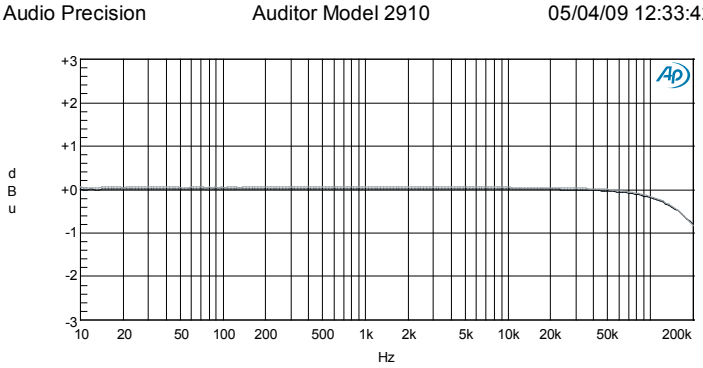
Protect Your Hearing

Always reduce volume before you put on headphones or before you remove or plug in the headphone. This excludes louder clicks and pops reaching the ear. In addition, this can avoid unpleasant surprise that follows when a headphone's lower impedance suddenly reproduces a much higher – even painful – level.

Always take care of your hearing when monitoring – especially with headphones. Reduce volume all the time as far as possible and expose your hearing to higher volumes only for short periods. As an orientation: German laws oblige ear protection in the professional area if the hearing is exposed to more than 85 dB sound pressure level – this level can already damage the hearing in the long term.

The Auditor can produce sound pressure levels that may be dangerous for your hearing because the large impedance scale of headphones requires a large performance range. Always regulate volume by starting from the zero position especially when you start working or switch headphones.

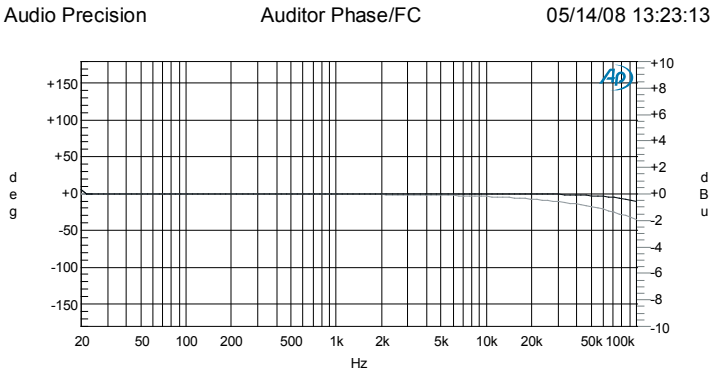
Measurements



Frequency Response Input/Headphone Output, Left and Right Channel

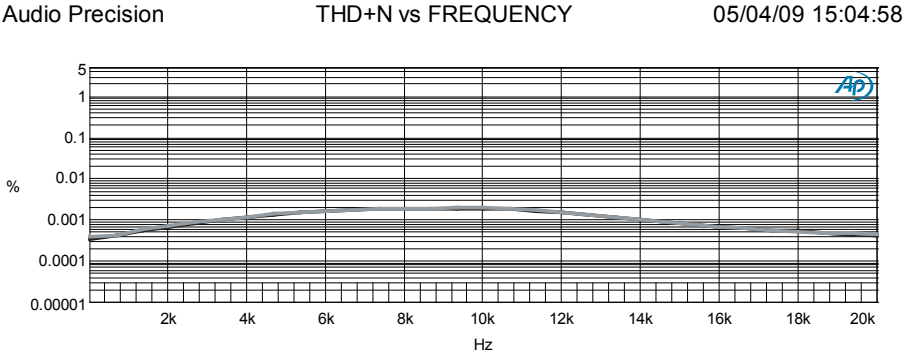
Measuring output and input 600 Ohm, Volume control Auditor 0 dB: ‹10 Hz to ›200 kHz (-3dB).
The large Frequency response range excludes that the frequency spectrum is limited at any point. Transmission of formants and octaves of an instrument's sounds can not be narrowed.

Measurements



Phase Response Input vs. Output, Left and Right Channel

Measuring output and input 600 Ohm, Volume control Auditor 0 dB. This measurement shows the minimum deviation of phase in the upper frequency range. Phase response describes the time difference between input and output signal – the less, the better. The extremely tight phase response up to 50 kHz excludes any audible effects.



THD vs. Frequency

Measuring output and input 600 Ohm, Volume control Auditor 0 dB.

THD vs. frequency range from 10 to 20 kHz at 0 dB over both channels. The values are extremely low around 0.001% throughout the whole range; even in long sessions this ensures listening without ear fatigue.

Audio

Frequency response:	‹5 Hz to ›200 kHz (-3 dB)
CMRR:	-80 dBu
(@1 kHz, odBu input level and unity gain)	
Crosstalk @ 1 kHz:	-84 dB
THD @ 1 kHz:	0,001 %
(@1 kHz, odBu input level and unity gain)	
Noise (A-weighted):	-97 dBu
Dynamic range:	129 dB
(@ connection with 600 Ω impedance)	

Inputs (XLR sockets, electronically balanced)

Impedance:	ca. 20 kΩ balanced ca. 10 kΩ unbalanced
Maximum Input Level:	+24 dBu

Outputs

XLR connections:	Input thru, electronically balanced
Headphone output:	6,35 mm stereo 1/4" TRS connection
Pin wiring: tip=left, ring=right, shaft=GND	
Min. Impedance connected:	9 Ω

Power Amplifier

Max. Output Performance:	1,7 W (+32,2 dBm) *@ 1 kHz and 600Ω connection*
	360 mW (+25,6 dBm) *@ 1 kHz and 30Ω connection*

Power Supply

Features:	Toroidal transformer with voltage selector
Voltages:	230 V AC, 50 Hz / 115 V AC, 60 Hz
Fuses (slow blow):	200-240 V AC: T 200 mA 100-120 V AC: T 400 mA
Power consumption:	max. 5,6 W/7,9 VA/0,03 A

Dimensions & Weight

Height x Width x Depth:	95 x 210 x 315 mm
Depth with Volume knob:	335 mm
Height with lifted feet:	127 mm
Weight:	2.65 kg/5,84 lbs

Note: odBu = 0,775 V. Specifications are subject to change without notice.

Guarantee & Product Registration

Please note the terms on the guarantee card enclosed in the package.

Direct SPL product support requires product registration. Please fill out the guarantee card in printed letters and send it directly to SPL. Or use the **online registration** form that may be reached at **www.spl.info**.