

# Professional Fidelity

Mastering Grade Listening



This User Manual is optimized for Acrobat Reader.

Interactive buttons may not appear in other applications.

## Phonitor e – User Manual

Headphone Amplifier



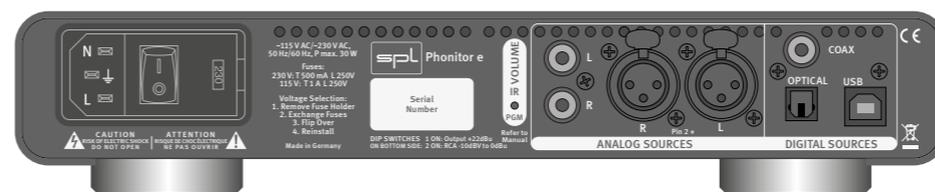
# Welcome

and thank you for purchasing the Phonitor e.

The Phonitor e is the ultimate headphone amplifier. It offers connections for headphones operated both balanced and unbalanced. With up to 3.7 W output power the Phonitor e delivers an impressive performance.

Up to five input sources can be connected. The Phonitor e features two analog stereo inputs (XLR and RCA) and optionally three digital audio sources (USB, coaxial, optical).

VOLTAiR technology is what we also call the SPL 120V Rail Technology within the Professional Fidelity series. This makes the Phonitor e an outstanding device in terms of dynamic range, signal-to-noise ratio and headroom delivering an exceptional sound experience with invincible serenity, transparency and realness.



# Content

Getting started	4	Source selection	17
Front view	5	Headphone outputs	18
Rearview	6	IR Remote control	19
Bottom view	7	DIP switches	21
DIP switches	7	Level increase of the headphone output	21
VOLTAiR – 120V Rail Technology	8	RCA input – HiFi level / Studio level	21
Comparisons	9	Specifications	22
Phonitor Matrix	11	Inputs	22
Basics of stereo listening	11	Outputs	23
Stereo listening with an “traditional“ headphone preamplifier	12	Internal operating voltages	25
How does the Phonitor Matrix work?	13	Power supply	25
Angle	14	Dimensions (incl. feet)	25
Crossfeed	15	Weight	25
Phonitor Matrix presets	16	Important Notes	26
		Declaration of CE Conformity	26



# Getting started

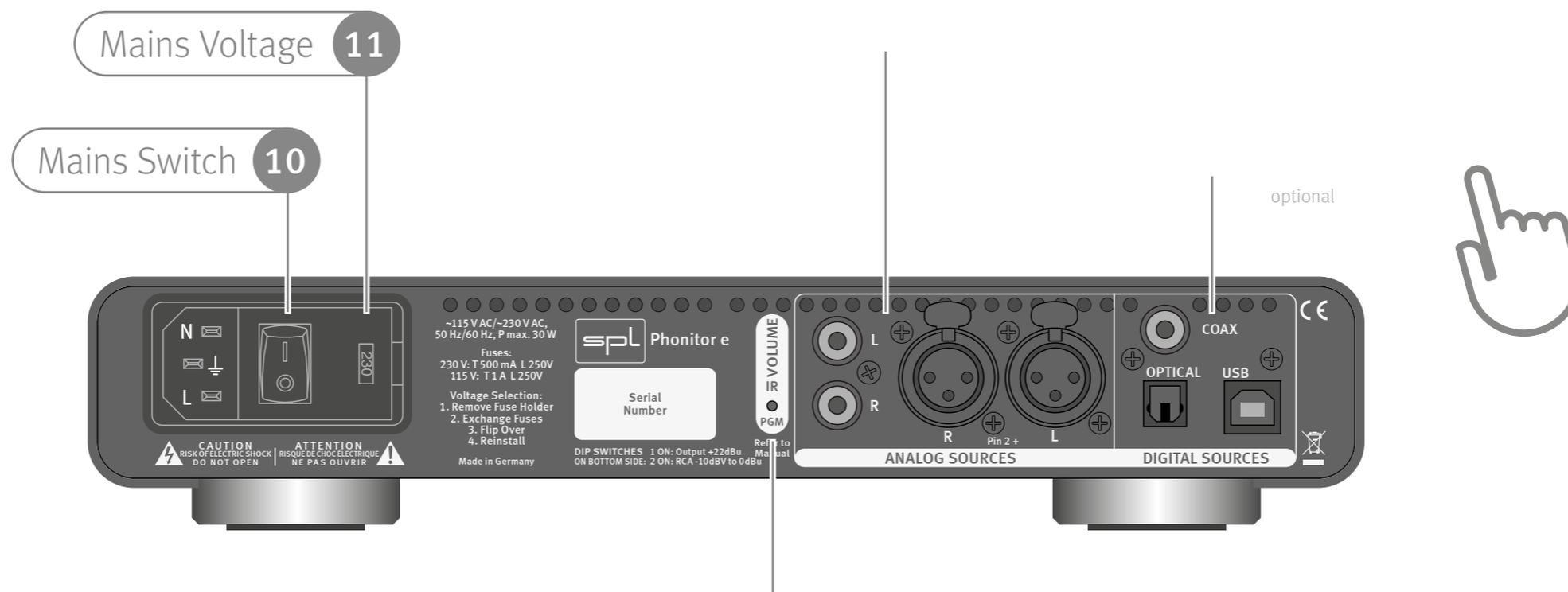
Read thoroughly and follow the instructions as well as the security advices of the Quickstart which is enclosed in the scope of delivery! You can also download the Quickstart [here](#).

- By pressing the -Button you get to the table of contents.
- By pressing the -Button you get to the front view of the unit.
- By pressing the -Button you get to the rear view of the unit.
- By pressing the -Button you get to the bottom view of the unit.
- By pressing the -Button you get to the previous content.

# Front view

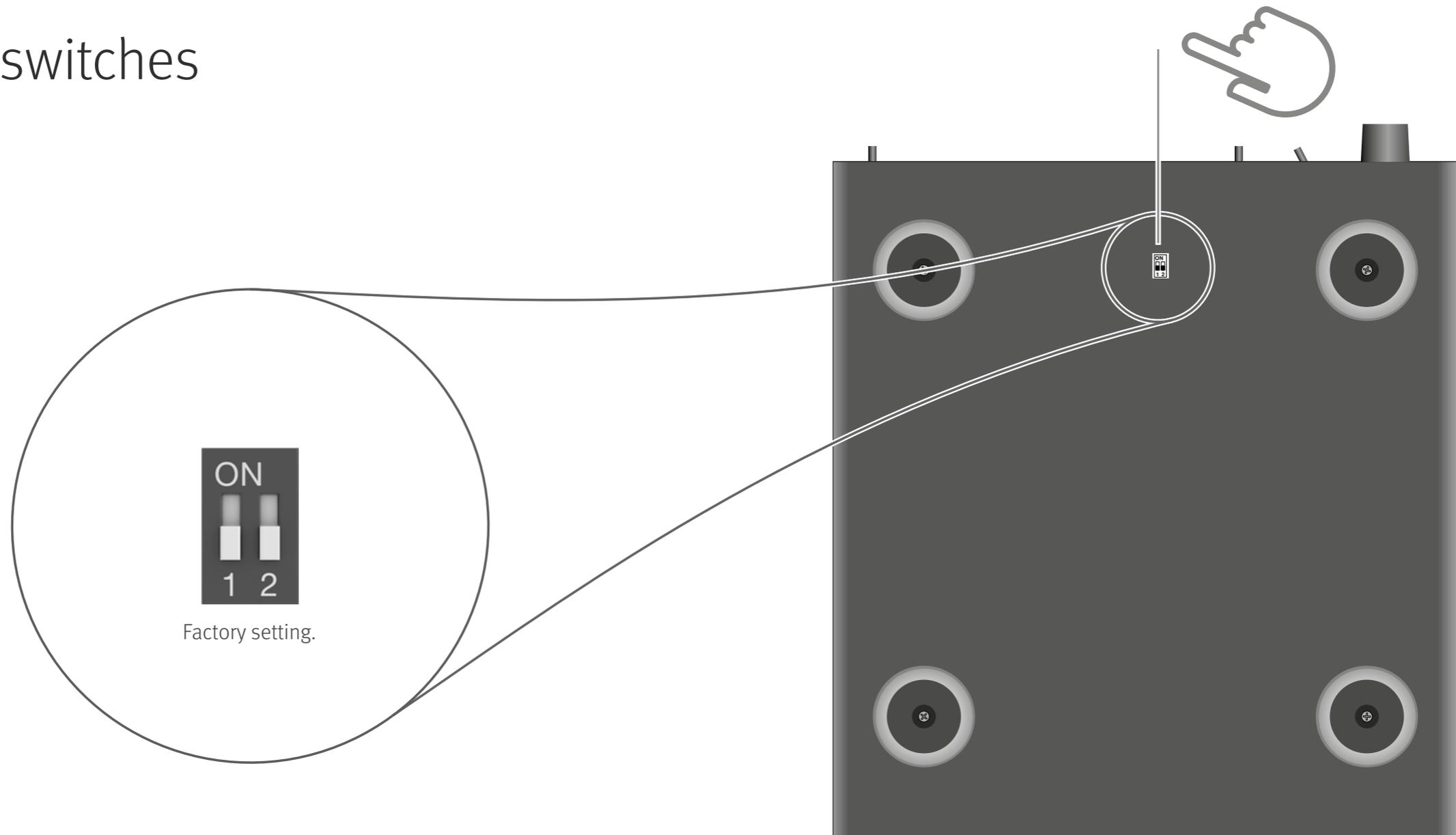


# Rearview



# Bottom view

## DIP switches



# VOLTAiR – 120V Rail Technology

VOLTAiR is the synonym for our 120V Rail Technology within the Professional Fidelity series. The audio signals are processed with an unequalled  $\pm 60V$  DC, which corresponds to twice that of discrete operational amplifiers and four-times that of semiconductor operational amplifiers.

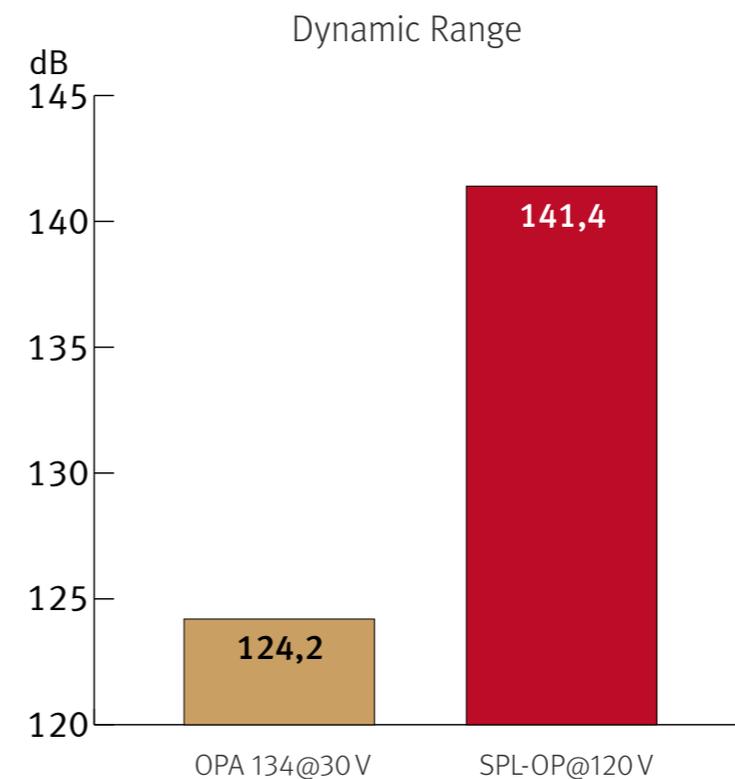
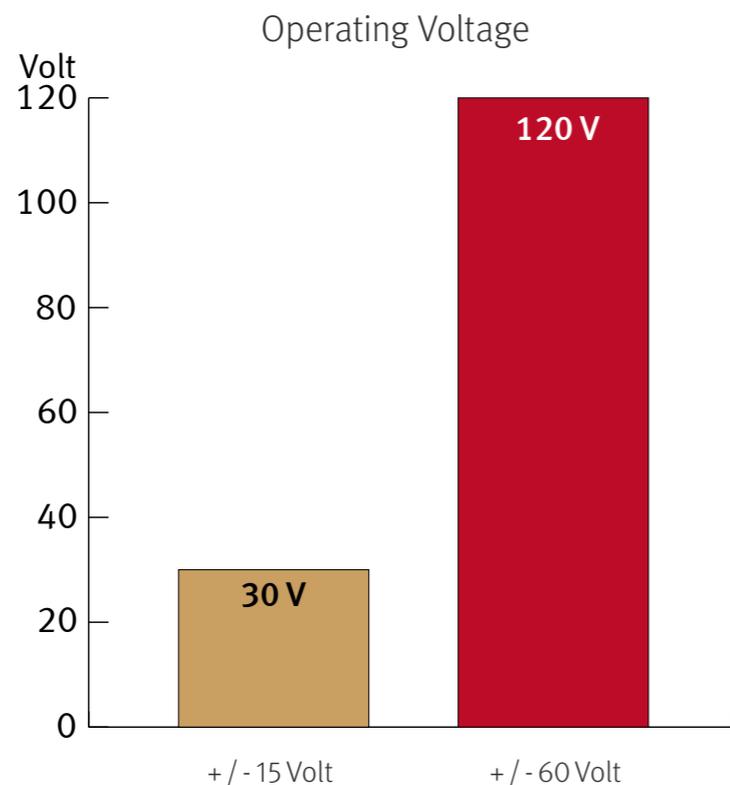
VOLTAiR Technology reaches outstanding technical and sonic performances. Technically especially in terms of dynamic range and headroom and sonically especially in reproducing the finest details and delivering a totally relaxed sounding audio experience. Music sounds absolutely natural.

SPL's 120V Rail Technology is the internal audio processing voltage ( $\pm 60V$  DC).  
It is not to be confused with the external mains voltage (e.g. 115V or 230V AC).

# Comparisons

These diagrams show how our VOLTAiR Technology compares to other circuits.

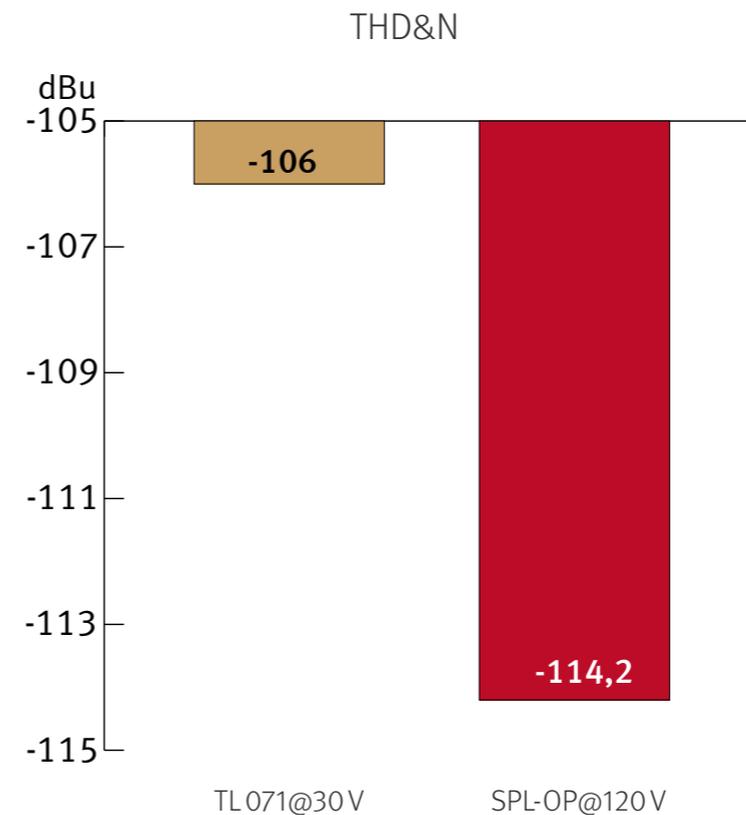
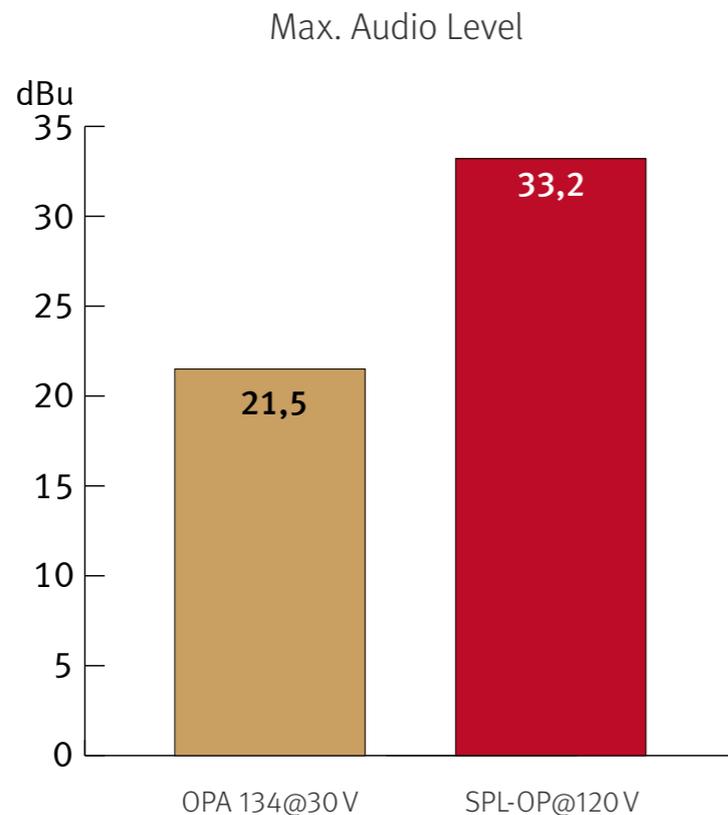
The direct relation between operating level and maximum level is fundamental for the classification: the higher the operating level, the higher the maximum level a circuit can handle. And since virtually all essential acoustic and musical parameters depend on this relation, a higher operating voltage also has a positive impact on the dynamic range, distortion limit and signal-to-noise ratio.



Do bear in mind that dB scales do not represent linear but rather exponential increases. A 3 dB increase corresponds to doubling the acoustic power, +6 dB correspond to twice the sound pressure level, and +10 dB correspond to twice the perceived loudness.

When it comes to volume, the VOLTAiR Technology exhibits a performance, in regard to maximum level and dynamic range, that is twice that of common components and circuits given that its values are approximately 12 dB higher.

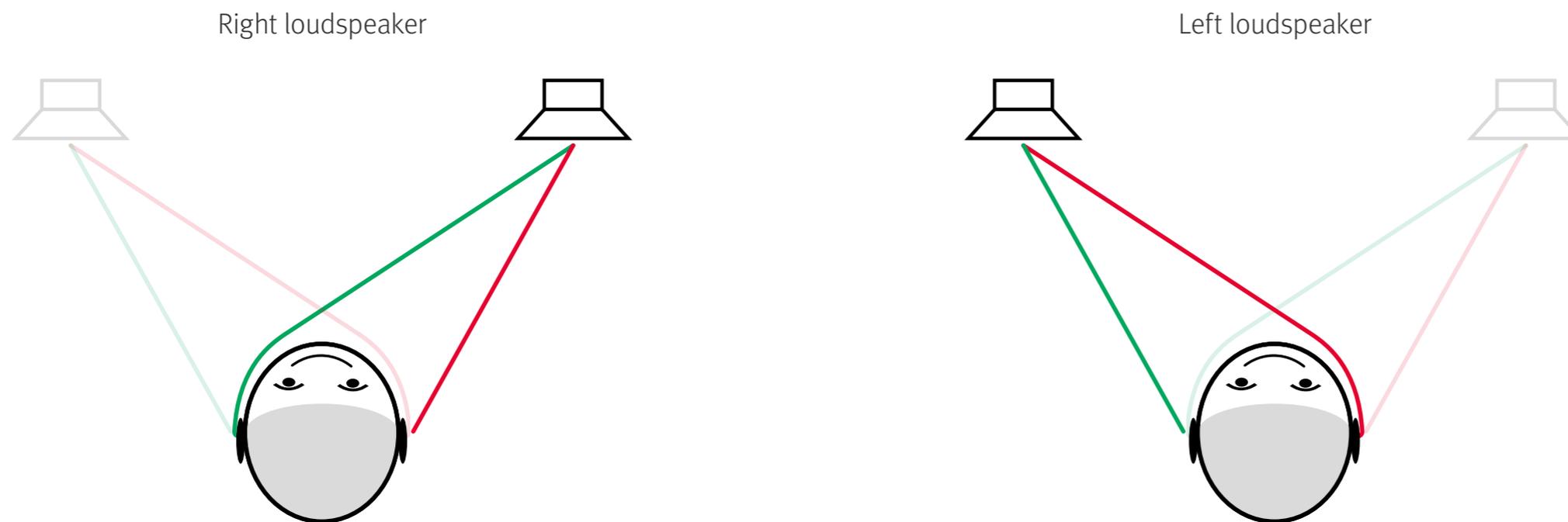
THD measurements show a difference of more than 8 dB compared to the TL071 at 30 V — in terms of sound pressure level, that corresponds to an improvement of more than 130%. The operating level most commonly used for audio equipment is +/- 15 volts.



# Phonitor Matrix

## Basics of stereo listening

When listening to speakers sound coming from the right is not only perceived with the right ear (red line) but it is also perceived with the left ear (green line). The sensation is time delayed, lower in level and has a reduced frequency range (this applies to the left speaker accordingly).



It arrives later because the signal travels a distance of approx. 340 meters per second and the distance from the right speaker to the left ear is longer than it is to the right ear. It is quieter and does not deliver the full frequency range, because the signal of the right speaker does not directly arrive at the left ear but is partially reflected and absorbed by the head.

Our brain determines the direction of the sound by perceiving the time delay (interaural time difference) and the level difference (interaural level difference).

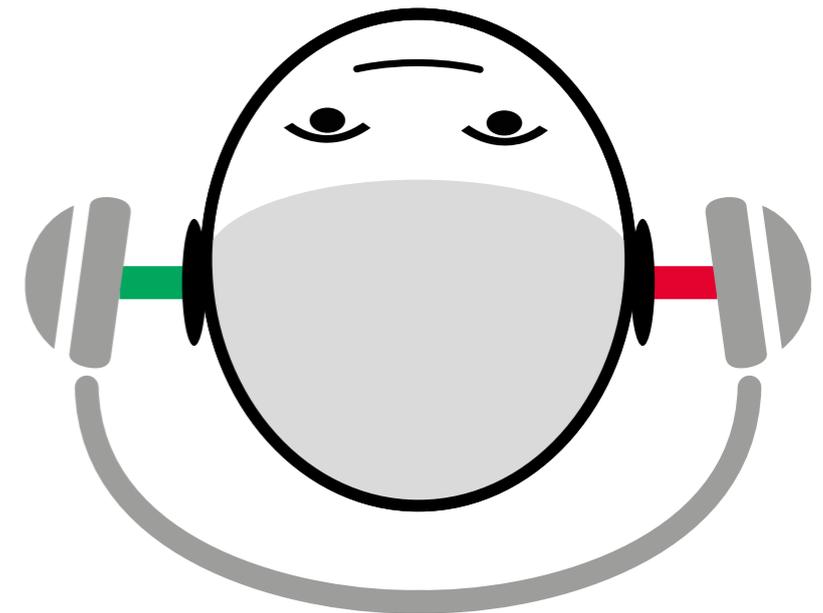
## Stereo listening with an “traditional” headphone preamplifier

When listening to music with a traditional headphone amplifier, the right ear only perceives the right signal (red line) and the left ear only perceives the left signal (green line).

The delayed and quieter signal of the respective opposite side is missing. This unnatural sound irritates the ear and is stressful for our brain, because it constantly is busy trying to locate the direction of the sound.

Besides, this super-stereo-effect leads to an exaggerated stereo width. Instruments that are placed in the stereo field appear to be located much further outside than desired.

These unnatural effects are corrected by the Phonitor Matrix.



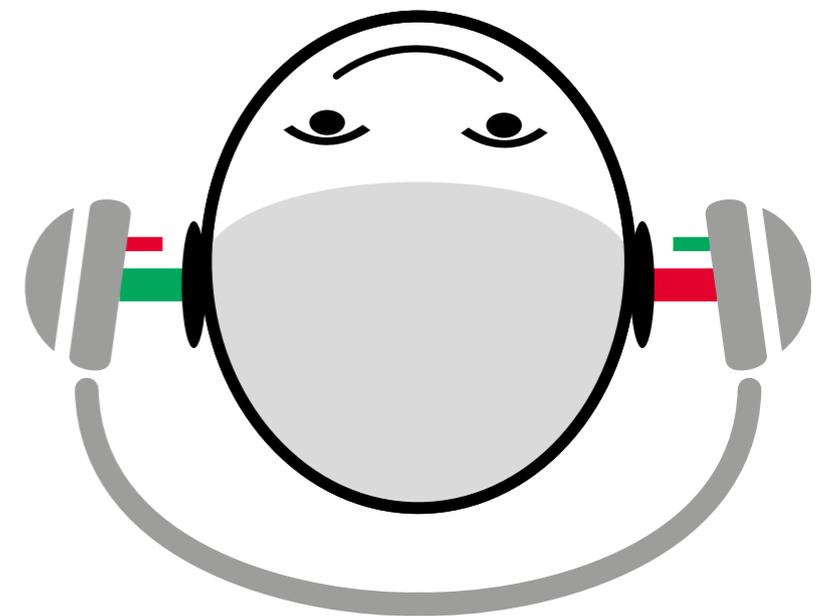
## How does the Phonitor Matrix work?

In simple terms, the Phonitor Matrix creates a speaker-like listening experience on headphones. It calculates the time and level differences with their specific frequency responses to deliver a true rendition of a speaker playback.

Because time and level differences are set like real loudspeaker placement, the brain is able to correctly identify the direction of the sound.

You can perceive a speaker-like listening experience.

All instruments appear at the correct position within the stereo image – just like it was intended when it was mixed in the studio. In comparison to a traditional headphone amplifier it provides the best conditions minimizing hearing fatigue.

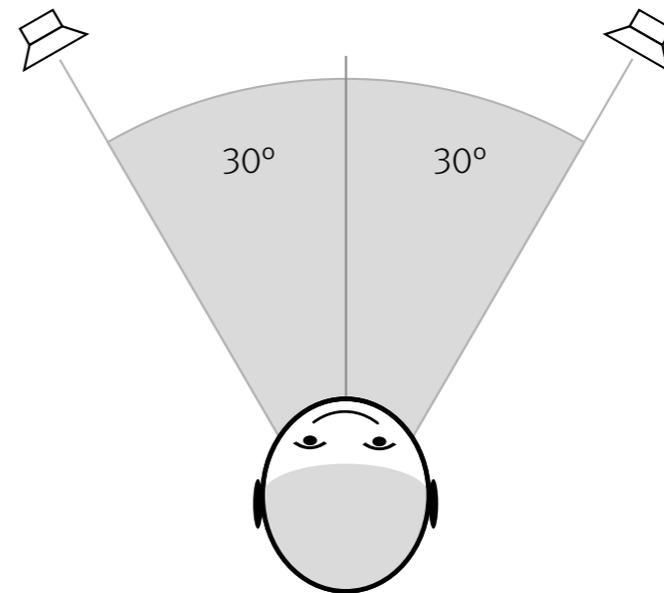


## In Detail

The Phonitor e makes use of analog filter networks to create the interaural level and time differences. The time difference relates to the standard stereo speaker placement of  $30^\circ$ . The Phonitor e offers two crossfeed settings to create the interaural level difference.

## Angle

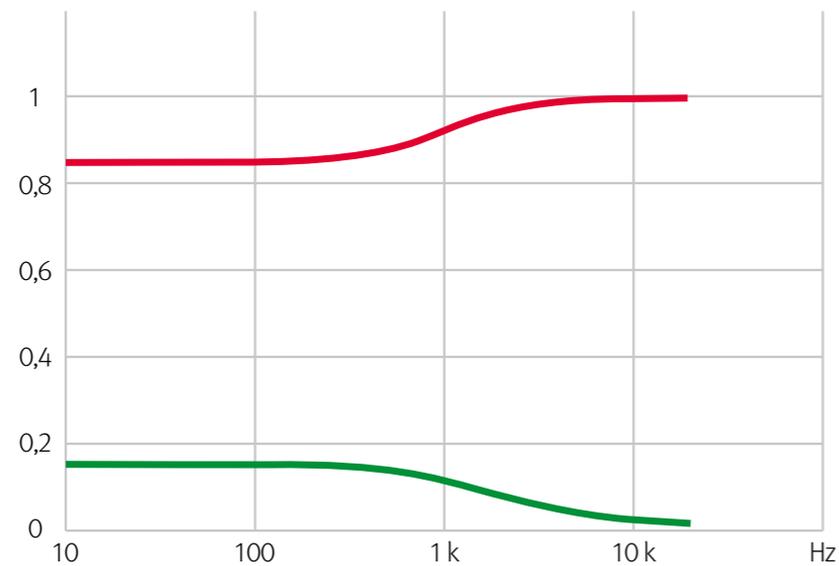
The Phonitor e has a fixed  $30^\circ$  speaker angle placement representing the standard speaker set-up.



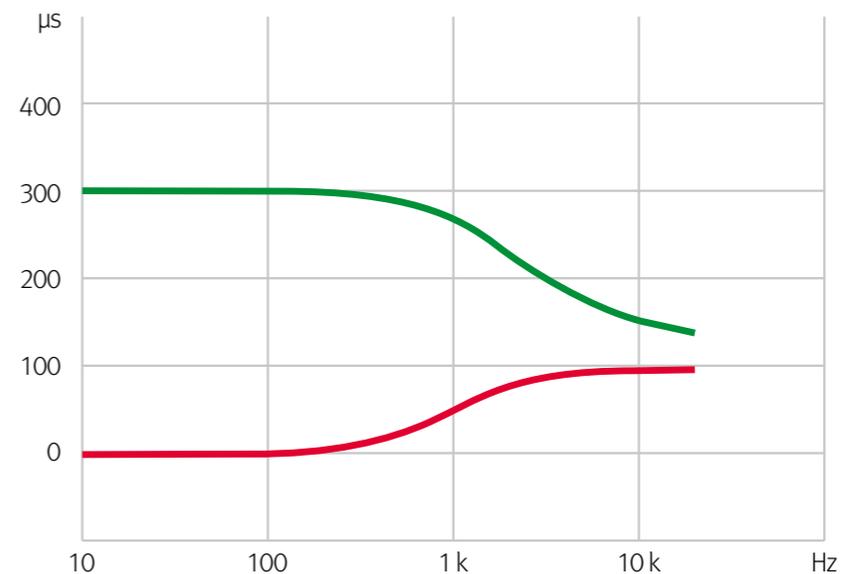
# Crossfeed

Crossfeed defines the interaural level difference. The two crossfeed values approximate the influences of room size, reflection and absorption characteristics.

Frequency corrected level difference at Crossfeed C1 and 30° Angle of the right channel (red = right signal, green = left signal)



Frequency corrected time difference at Crossfeed C1 and 30° Angle of the right channel (red = right signal, green = left signal)



The interaural level difference and the interaural time difference are frequency-corrected because the sound is reflected and absorbed by the head in a non-linear fashion.

## Phonitor Matrix presets

The Phonitor e offers two presets. The Speaker Angle is fixed to 30°. For the Crossfeed there are two settings: C1 and C2.

The value C1 has less crossfeed and therefore a lower time difference than C2.



# Source selection

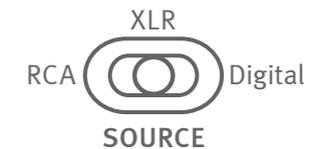
Up to five audio sources can be connected to the Phonitor e.

It features two analog stereo inputs – [XLR and RCA \(12\)](#).

Phonitor e can be equipped with a DA converter. With that installed the available inputs are expanded by [USB, coaxial and optical digital stereo inputs \(13\)](#).

- Select an analog audio source by using the [SOURCE switch \(7\)](#) – RCA or XLR.
- You can select an digital audio source (USB, coaxial, optical) by using the [DIGITAL switch \(6\)](#).

Set the SOURCE switch to Digital.



# Headphone outputs

The [standard headphone output \(2\)](#) takes priority over the [balanced headphone output \(3\)](#). There is no signal at the balanced headphone output if a headphone is already plugged into the standard headphone output.

To protect the headphone power amplifier stage and guarantee a long and consistent performance please note:

- Turn down VOLUME before swapping headphones.
- Never insert a mono jack plug into the front panel stereo jack.
- Make sure that the headphones stereo jack is fully inserted.
- If you use an adapter from 3,5 mm to 1/4" (6,35 mm) on your headphone make sure that the adapter is fully screwed on respectively fully plugged in.

# IR Remote control

The volume potentiometer can be remotely controlled using any infrared (IR) remote control.

The special feature is that the Phonitor e learns your remote and not the other way around. You do not need a universal remote control. Take, for example, the remote control of the CD player. Out of the many buttons there are two you hardly use if at all. Assign Volume up / Volume down to these two buttons and let the Phonitor e learn them.

- Press the [PGM IR VOLUME button \(14\)](#) on the rear of the unit until you note the actuation point. The Power LED now lights up brighter.
- Point your remote control towards the [IR Receiver \(9\)](#) and push the button you wish to use to **lower the volume**. The power LED flashes once per push. Press the same button repeatedly until the power LED flashes three times within a short interval – programming this button is then completed.
- Point your remote control towards the [IR Receiver \(9\)](#) and push the button you wish to use to **increase the volume**. The power LED flashes once per push. Press the same button repeatedly until the power LED flashes three times within a short interval – programming this button is then completed.



- Learn mode ends automatically after the second button is learned.
- Please note: direct insolation of strong light (e.g. sun light, halogen lamps, neon tubes, fluorescent tubes, terrarium and aquarium lights as well as big flat screens) may lead to misoperation of the remote control functions.

# DIP switches

With the [DIP switches \(15\)](#) on the bottom of the unit the following settings can be chosen:

## Level increase of the headphone output

By using the DIP switch 1 you can increase the level of the headphone outputs to better feed power-hungry headphones.

DIP switch 1: ON = The headphone output is boosted to +22 dB.

## RCA input – HiFi level / Studio level

If you connect a HiFi audio device (e.g. a CD player) to the analog [RCA input \(12\)](#), you can amplify the signal from HiFi level to studio level with DIP switch 2.

The sources are then equal in level when you switch between XLR and RCA (provided that a studio signal is present at the XLR input).

DIP switch 2: ON = The RCA input is boosted from -10 dBV (HiFi level) to 0 dBu (studio level).

# Specifications

## Inputs

### XLR inputs

- Neutrik XLR, balanced, Pin 2 = (+)
- Impedance: ca. 20 kohms
- CMR: -82 dBu (at 1 kHz)
- Max. Input level: +32.5 dBu

### RCA inputs

- Unbalanced
- Impedance: ca. 10 kohms
- Max. Input level: +32.5 dBu

### Digital inputs (optional DAC 768xs) / sample rates

- Coaxial SPDIF (RCA) - sample rates PCM (kHz): 44.1, 48 , 88.2, 96, 176.4, 192
- Optical TOSLINK (FO6) – sample rates PCM (kHz): 44.1, 48 , 88.2, 96
- USB (B) – Encoded PCM (kHz): 44.1, 48 , 88.2, 96, 176.4, 192, 352.8, 384, 705.6, 768  
DSD: DSD1 (DSD64), DSD2 (DSD128), DSD4 (DSD256)

# Outputs

## Balanced headphone output

- Neutrik 4-pin XLR connector
- Pin wiring: 1 = L (+), 2 = L (-), 3 = R (+), 4 = R (-)
- Impedance: 0.36 ohms
- Damping factor: 180 @ 40 ohms
- Frequency range: 10 Hz to 300 kHz ( -3 dB)
- Crosstalk at 1 kHz: -90 dB
- THD & N: 0.00091 % (at 0 dBu, 1 kHz, 100 kohms load)
- Noise (A-weighted): -98 dBu
- Dynamic range: 130.5 dB

## Standard headphone output



Warning: Never connect a mono jack cable to the standard headphone output (front panel stereo jack). Make sure that the stereo jack is fully inserted, otherwise a short circuit might damage the headphone amplifier!

- 6.35 mm TRS connector
- Pin wiring: Tip = Left, ring = right, sleeve = GND
- Impedance: 0.18 ohm
- Attenuation factor: 180 @ 40 ohms
- Frequency range: 10 Hz to 300 kHz (-3 dB)
- Crosstalk at 1 kHz: -90 dB
- THD & N: 0.00091% (at 0 dBu, 1 kHz, 100 kohms load)
- Noise (A-weighted): -103 dB
- Dynamic range: 135.5 dB

## Max. Output power (at +30 dBu @ 1 kHz)

- 2 x 1 W at 600 Ohm impedance
- 2 x 2 W at 300 Ohm impedance
- 2x 3.7 W at 120 Ohm impedance
- 2x 2.9 W at 47 Ohm impedance
- 2x 2.7 W at 32 Ohm impedance

## Internal operating voltages

- Analog: +/- 60 V
- Digital: + 5 V and + 3.3 V (optional)

## Power supply

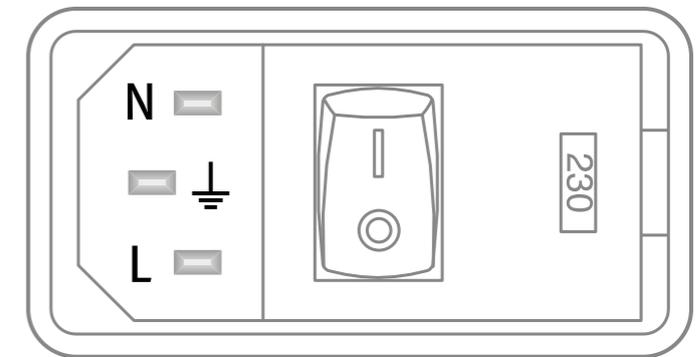
- Mains voltage (switchable): 230 V AC / 50 Hz or 115 V AC / 60 Hz
- Fuses: 230 V: T 500 mA; 115 V: T 1 A
- Power consumption: max 30 VA
- Stand-by power consumption: 0.7 W

## Dimensions (incl. feet)

- (WxHxD) 10.94 x 2.24 x 12.99 in (278 x 57 x 330 mm)

## Weight

- 7.27 lbs (3.3 kg), unit only
- 9.70 lbs (4.4 kg), shipping



# Important Notes

Version 1.3 – 11 /2019

Developer: Bastian Neu

This manual includes a description of the product but no guarantee as for specific characteristics or successful results. Unless stated otherwise, everything herein corresponds to the technical status at the time of delivery of the product by SPL electronics GmbH. The design and circuitry are under continuous development and improvement. Technical specifications are subject to change.

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## Declaration of CE Conformity

 The construction of this unit is in compliance with the standards and regulations of the European Community.