HE 1 MANUAL

HE 1

Instruction manual

Sennheiser electronic GmbH & Co. KG

Am Labor 1, 30900 Wedemark, Germany
www.sennheiser.com

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Headphones

① Headband, adjustable in increments
② Aluminum heat sink for high-voltage amplifier
③ Electrostatic transducers
④ Ear pads
⑤ Structure-borne noise reducing cable connections
⑥ Highly flexible OFC headphone cable, PTFE insulated, insensitive to structure-borne noise

Remote control

⑦ Infra-red transmitter
⑧ On/off button ⏻
⑨ Control buttons for glass cover
- BOX 1 O/C storage box 1
- BOX 2 O/C storage box 2

⑩ OUTPUT selection buttons
- PHONES
- LINE

⑪ CROSS FEED selection buttons
- OFF
- LOW
- HIGH

⑫ INPUT selection buttons
- OPTICAL
- USB
- COAXIAL
- UNBALANCED
- BALANCED

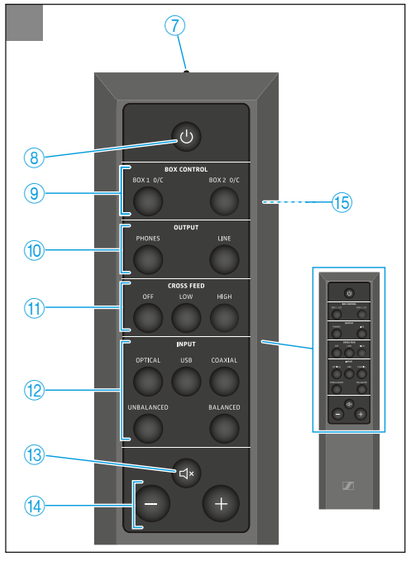
⑬ Mute button 🔇
⑭ Volume buttons –/+
⑮ Battery compartment for CR2032 battery, 3 V (located at the bottom side)

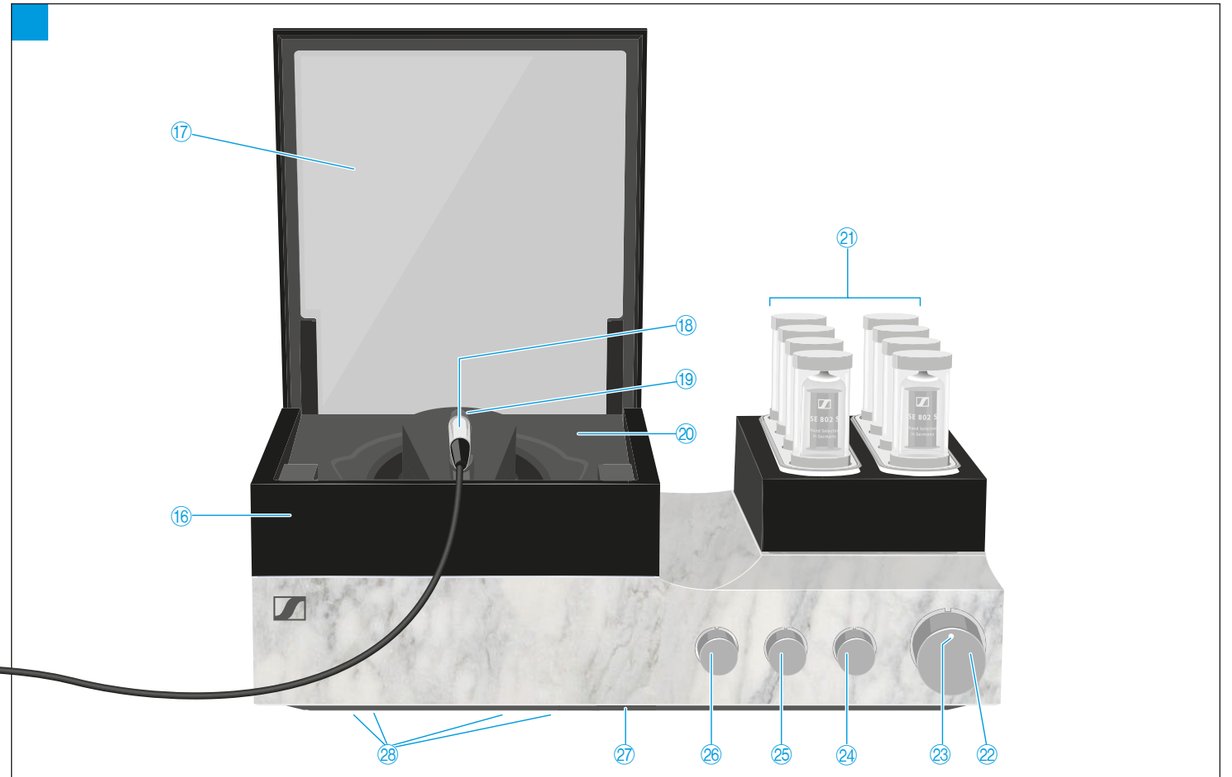
Amplifier (front panel)

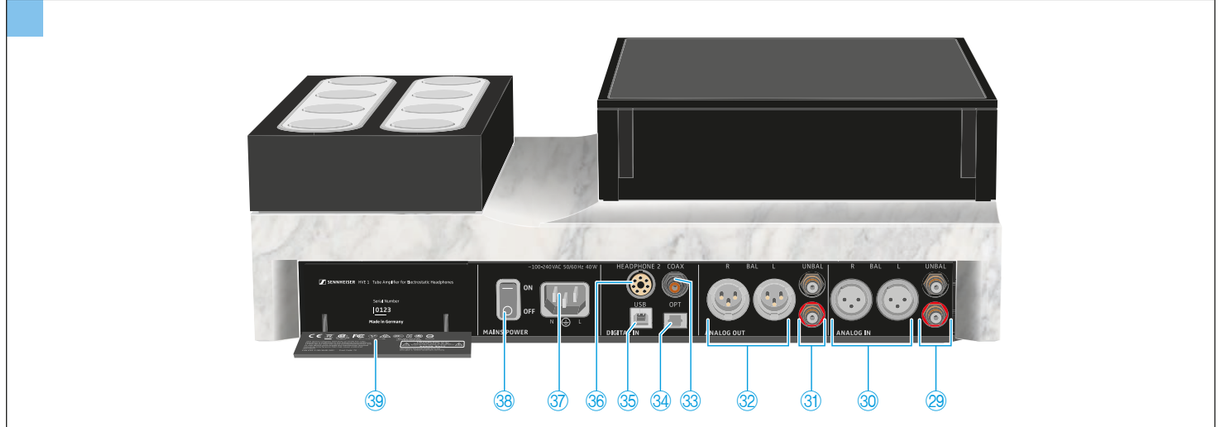
⑯ Headphone storage box
⑰ Glass cover
⑱ Headphone plug
⑲ Headphone socket 1 (HEADPHONE 1)
⑳ Headphone compartment with velvety-soft flocking
㉑ Amplifier tubes, housed in protective cylinders
㉒ On/off button and volume control
㉓ Status LED
㉔ OUTPUT selection rotary switch
㉕ CROSS FEED selection rotary switch
㉖ INPUT selection rotary switch
㉗ Infra-red remote control sensor
㉘ Vibration absorbing feet

Amplifier (rear panel)

㉙ RCA input sockets, unbalanced (UNBAL) red R, black L
㉚ XLR-3 input sockets, balanced (BAL / R / L)
㉛ RCA output sockets, unbalanced (UNBAL) red R, black L
㉜ XLR-3 output sockets, balanced (BAL / R / L)
㉝ S/PDIF input, coaxial (COAX)
㉞ S/PDIF input, optical (OPT)
㉟ USB input (Type B) (USB)
㊱ Headphone socket 2 (HEADPHONE 2)
㊲ IEC mains socket (~100-240 VAC 50/60 Hz 40 W)
㊳ Power switch (ON/OFF)
㊴ Cover for product information and approvals







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Contact

If you have any questions regarding your HE 1 or require any help, please contact your Sennheiser partner:

Hotline: +49 69 89 91 47 95 (deutsch, english, français, español, 汉语, العربية)

Email: HE1@sennheiser.com

Internet: www.sennheiser.com

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Phone: +49 (0)5130 600 0

⚠ Important safety instructions

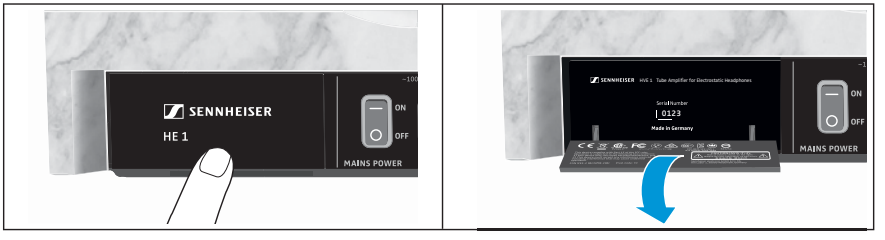
1. Read these safety instructions.
2. Keep these safety instructions. Always include these safety instructions when passing the product on to third parties.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use the product near water.
6. Only clean the product when it is not connected to the power supply system. Clean only with a dry cloth.
7. Ensure circulating ventilation. The product generates heat which is dissipated through the housing, especially through the extended tubes. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other products that produce heat and do not expose to direct sunlight.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power supply cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where it exits from the product.
11. Use only attachments/accessories/spare parts supplied or recommended by Sennheiser.
12. Use only with shelves, racks, or tables that can safely support the weight the product (see "Specifications" on page 51). Please note that the installation location and the substructure have effects on the sound quality.
13. Unplug the product during lightning storms or when unused for long periods of time.

14. Refer all servicing to qualified service personnel. Servicing is required when the product has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the product, when the product has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. WARNING: To reduce the risk of fire and electric shock, do not expose the product to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the product.
16. To completely disconnect this product from the AC mains, disconnect the power supply cord plug from the AC receptacle.
17. The plug of the power supply cord shall remain readily accessible.

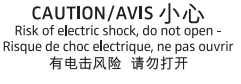
Hazard warnings on the rear of the product

The label shown on the left can be found at the rear of the amplifier behind a hinged cover.

▷ Lightly press the lower part of the cover to open it.



The symbols on this label have the following meaning:

	Presence of uninsulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of fire or electric shock.
	Read and follow the safety and operating instructions contained in this instruction manual.
	Never open the product as there is a risk of electric shock. There are no user serviceable parts inside the product. Only refer repairs to an authorized Sennheiser service partner.

Safety instructions for lithium batteries (BFI 1 remote control)

WARNING

If abused or misused, the batteries may leak. In extreme cases, they may even present a risk of

- explosion,
- fire development,
- heat generation,
- smoke or gas development.

	Keep away from children.		Remove the batteries if the product will not be used for extended periods of time.
	Observe correct polarity.		Pack/store charged batteries so that the terminals cannot contact each other – danger of shorting out/fire hazard.
	Immediately remove the batteries from an obviously defective product.		Only use batteries specified by Sennheiser.
	Dispose of batteries at special collection points or return them to your specialist dealer.		Store the products in a cool and dry place at room temperature (approx. 20 °C/68 °F).
	Do not mutilate or dismantle.		Do not continue to use defective batteries.
	Do not expose to moisture.		Do not heat above 70 °C/158 °F, e.g. do not expose to sunlight or throw into a fire.

Preventing damage to health and accidents

- Protect your hearing from high volume levels. Permanent hearing damage may occur when headphones are used at high volume levels for long periods of time. Sennheiser headphones sound exceptionally good at low and medium volume levels.
- Do not use the headphones when your hair is damp or wet.
- Do not insert pointed objects through the outer and inner covers of the headphones to avoid contact with live parts or the delicate diaphragms.
- Do not use the product when the protective cylinders of the amplifier tubes are removed.
- Keep the product, accessories and packaging parts out of reach of children and pets to prevent accidents and choking hazards.
- Do not use the product in an environment that requires your special attention (e.g. when performing skilled jobs).

Preventing damage to the product and malfunctions

- If the product was moved from a cold environment to a warm one, allow the product to stand for at least 2 hours before putting it into operation.
- Do not place your headphones on a dummy head, chair armrest or similar objects for long periods as this can widen the headband and reduce the contact pressure of the headphones.

Intended use/Liability

The electrostatic headphones and the tube headphone amplifier have been designed for reproducing music from analog and digital high-end systems.

This product is intended for private domestic use only.

It is considered improper use when the product is used for any application not named in the corresponding instruction manual.

Sennheiser is not liable for damages to USB devices that are not consistent with the USB specifications.

Sennheiser does not accept liability for damage arising from abuse or misuse of this product and its attachments/accessories.

Before putting into operation, please observe the respective country-specific regulations.

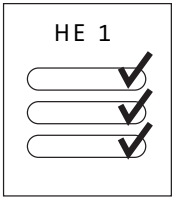
Notes on the use and disposal of storage media

You can use the supplied USB flash drive for storing data, including personal data. If the flash drive is sold/passed on or disposed of, the data once stored on it and then deleted using a standard delete method can be recovered with special software and be misused.

We therefore recommend using special software for secure deletion of data to ensure that personal data is not misused. Please note that you yourself are responsible for the secure deletion of the data on your flash drive.

We recommend backing up the data saved on your flash drive regularly. Sennheiser does not accept liability for damage or loss of data.

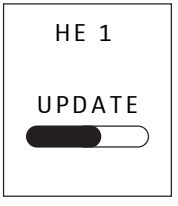
Notes on servicing



We recommend having the product serviced regularly (about every 3 years) to maintain the perfect sound reproduction of the electrostatic headphones and the tube headphone amplifier. Contact your Sennheiser partner to arrange for a complete revision and careful refreshment of the product (see "Contact" on page 4).

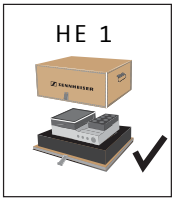
The service card inserted in the rear cover of this instruction manual provides information on the servicing carried out.

Notes on driver and firmware updates



We recommend using the latest DAC (digital-to-analog converter) firmware for your tube headphone amplifier and the latest driver for your operating system (MacOS), Windows).
DAC firmware and driver updates can be downloaded free of charge from the Internet at www.sennheiser.com/download or can be obtained from your Sennheiser partner (see page 18 and 45).

Notes on the packaging



We recommend using the original packaging to ensure safe storage and transport of the HE 1. Damage during transport is often caused by the use of unsuitable packaging. The original packaging of the HE 1 provides optimal protection and minimizes the risk of damage during transport.

Alternatively, you can contact your Sennheiser partner to arrange for the transport of the HE 1 (see "Contact" on page 4).

Package contents

HVE 1 tube headphone amplifier

HE 1-HP electrostatic headphones

3 power cables (only for regions with EU, UK and US power plug, length 1.8 m)

BFI 1 remote control
incl. CR 2032 battery (3 V)

Brochure, instruction manual, certificate with measurement result and service card

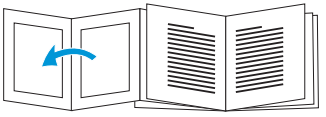
Microfiber cloth

USB flash drive (SD-U16L version) with instruction manual (as PDF file) and driver software for Microsoft Windows operating systems

Silk gloves for servicing

A list of accessories can be found on the HE 1 product page at www.sennheiser.com. For information on suppliers, contact your Sennheiser partner (see "Contact" on page 4).

Product overview



The product overview can be found on the fold-out page at the beginning of this instruction manual.

Overview of the LED indicator

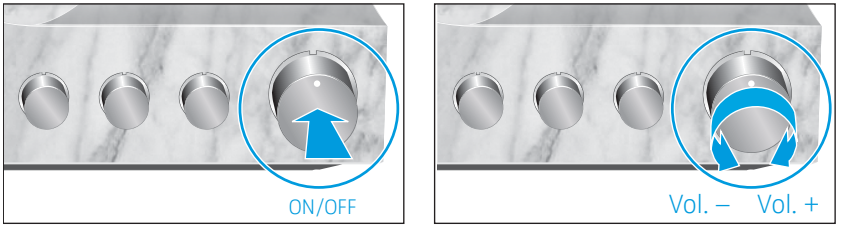
Status LED		Meaning
	–	Power switch set to position OFF
	lights up red	Standby
	lights up white	Operation
	pulses white	Headphones are/audio output is muted (OUTPUT rotary switch in position MUTE)
	lights up orange	Operation, a tube replacement is required (see page 42)
	pulses orange	Headphones are/audio output is muted (OUTPUT rotary switch in position MUTE), a tube replacement is required (see page 42)
	flashes blue quickly 2 times	Incompatible digital audio signal; headphones are/audio output is muted (OUTPUT rotary switch in position MUTE) (see page 16)
	flashes red quickly 2 times	High-voltage protection is activated; device cannot be operated (see page 50)
	flashes red quickly 3 times	Operating elements or amplifier tubes are blocked; device cannot be operated (see page 28)

Overview of the operating elements

On/off button and volume control

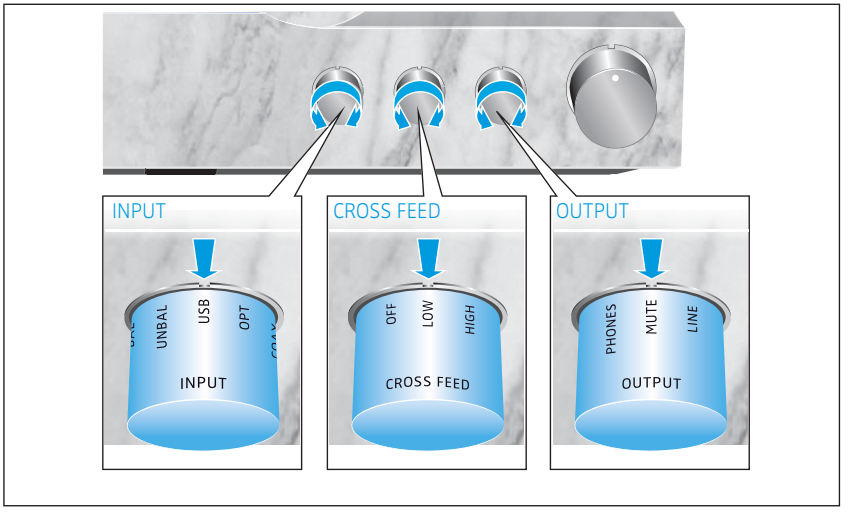
▷ Press the button to start the switch-on or switch-off process.

▷ Turn the control to steplessly adjust the volume.



Rotary switches

▷ Turn the INPUT, CROSS FEED or OUTPUT rotary switch until the desired setting points to the marking.



When using the remote control for adjusting a setting or the volume, the rotary switch or the volume control on the headphone amplifier automatically adjusts to the desired position.

Putting the HE 1 into operation

Setting up the tube headphone amplifier

CAUTION

Risk of staining of furniture surfaces!

Varnish or furniture polish may degrade the feet of the product, which could stain your furniture.

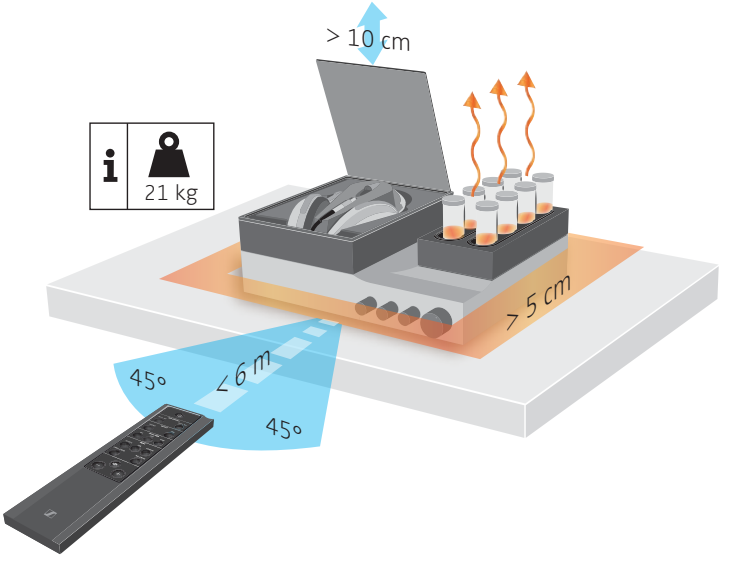
▷ Do not place the product on delicate surfaces; if necessary, use a non-slip pad under the product.

The installation location and the substructure have effects on the sound quality. Observe the following notes:

▷ Place the tube headphone amplifier on a stable, flat, horizontal and low-vibration surface that can safely carry the weight of the amplifier.

▷ Ensure circulating ventilation. The amplifier generates heat which is dissipated through the housing, especially through the extended tubes. Do not operate the amplifier in closed cabinets.

▷ The power switch at the rear of the amplifier must always be easily accessible.



- ▷ There must be sufficient room in front of and above the amplifier as the operating elements and the amplifier tubes extend automatically and the glass cover opens automatically (see diagram).
- ▷ Observe the range of the remote control (see diagram).

Connecting the tube headphone amplifier to audio sources

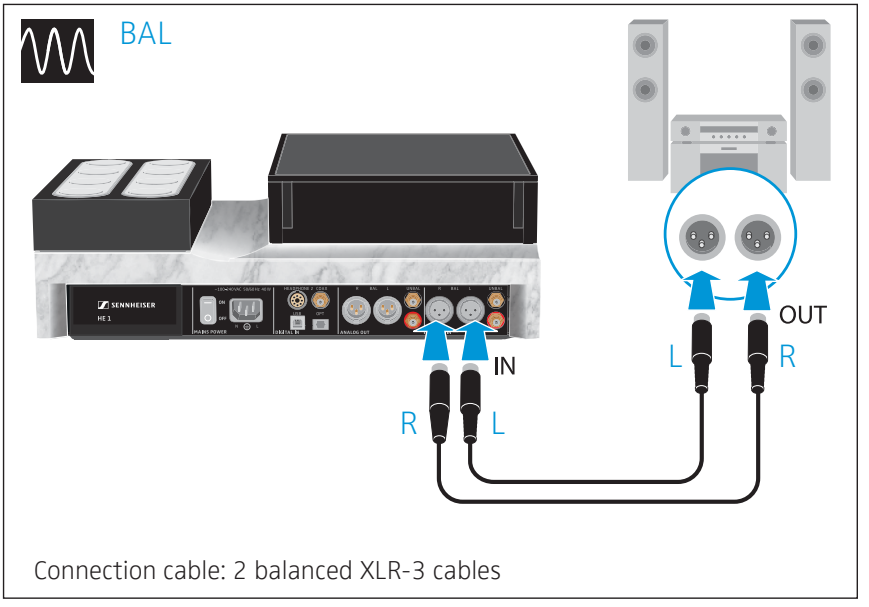
You can connect several audio sources to the tube headphone amplifier and switch between these connected sources using the INPUT rotary switch.

- ▷ Switch your audio sources off before connecting the tube headphone amplifier.
- ▷ Select a suitable high-quality connection cable for your audio source. Please observe the recommended maximum cable length as given in the table.
- ▷ To connect the tube headphone amplifier to your audio source, refer to the connection diagram suitable for your your audio source (see the following chapters):

Connection possibilities of the audio source			Connection cable	Max. cable length	Page
ANALOG	A	XLR-3 (BAL)	2 balanced XLR-3 cables	10 m	15
	B	RCA (UNBAL)	Stereo audio cable with 2 RCA connectors at each end	3 m	15
DIGITAL	C	USB (USB)	USB 2.0 certified cable with Type A and Type B connector	5 m	16
	D	Optical (OPT)	Optical cable	5 m	16
	E	Coaxial (COAX)	Coaxial cable (75 Ω)	5 m	16

A

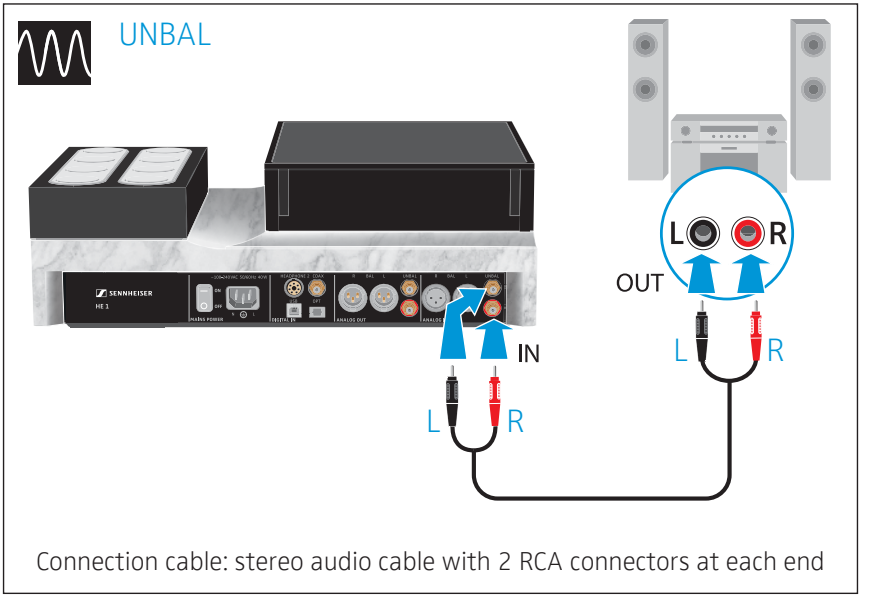
Connection possibility of the audio source: analog, XLR-3, balanced



Connection cable: 2 balanced XLR-3 cables

B

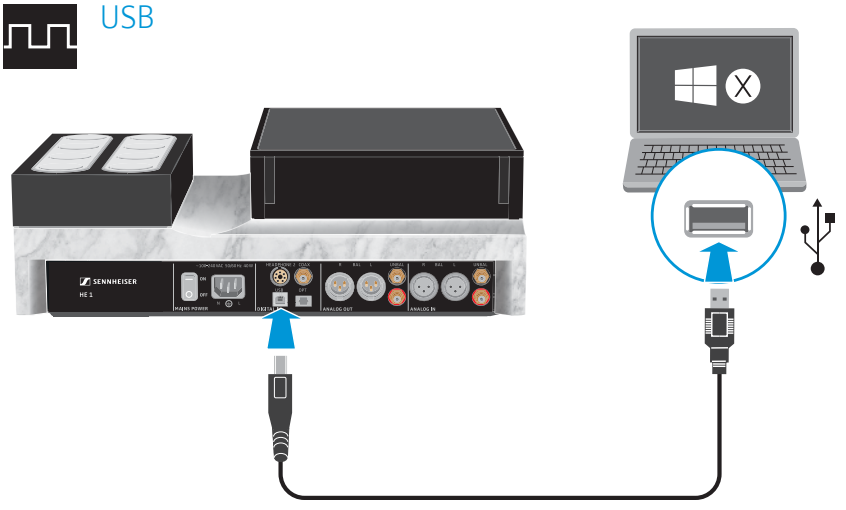
Connection possibility of the audio source: analog, RCA, unbalanced



Connection cable: stereo audio cable with 2 RCA connectors at each end

C

Connection possibility of the audio source: digital, USB connection



Connection cable: USB 2.0 certified cable with Type B connector for connection to the headphone amplifier

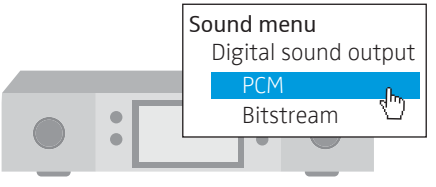
D E

Requirements for digital connections

The digital audio inputs (DIGITAL IN , OPT or COAX) can receive digital audio signals in **PCM** format (supported sample rates: optical: up to 96 kHz, coaxial: up to 192 kHz).

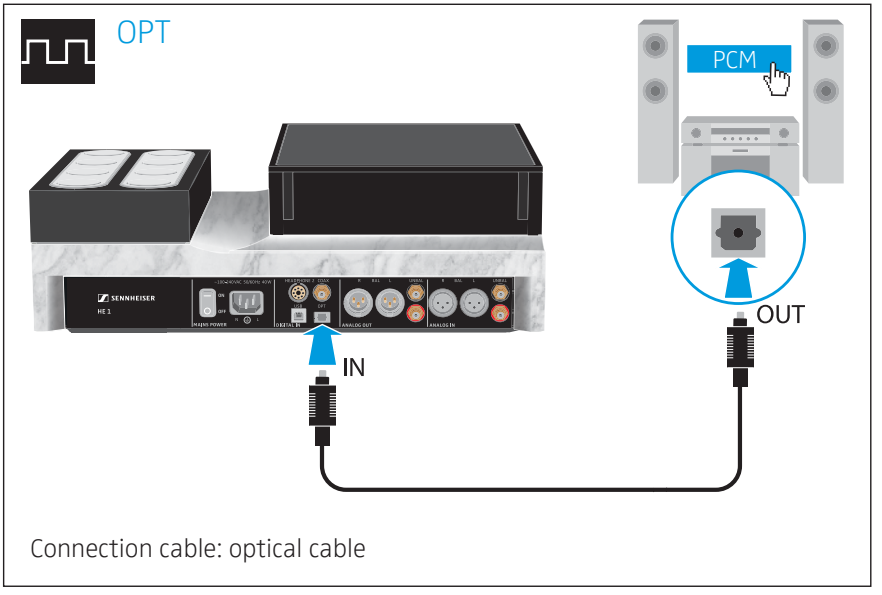
Information on how to set the audio signal of the connected device to PCM can be found in the Sound or Settings menu or in the instruction manual of your device.

If an incompatible digital audio signal is being received, the status LED of the HE 1 flashes blue. The headphones are/the audio output is muted (OUTPUT rotary switch in position MUTE) and music playback is not possible.



D

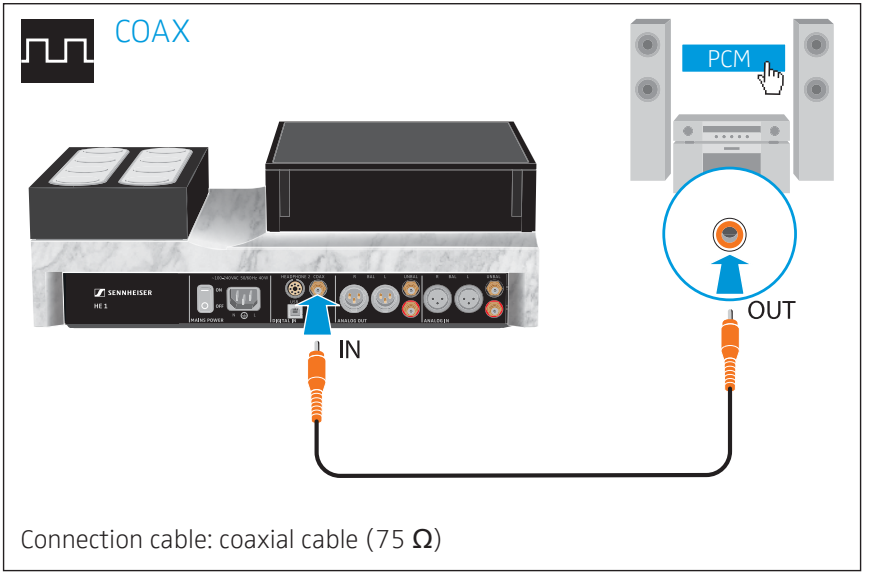
Connection possibility of the audio source: digital, optical connection



Connection cable: optical cable

E

Connection possibility of the audio source: digital, coaxial connection



Connection cable: coaxial cable (75 Ω)

Using the tube headphone amplifier connected to a Mac/PC

You can connect the HE 1 via USB directly to your Mac or PC and use it as an audio output device. Depending on the driver and settings used, high-resolution music files can be reproduced via the high-quality DAC (digital-to-analog converter) of the HE 1.

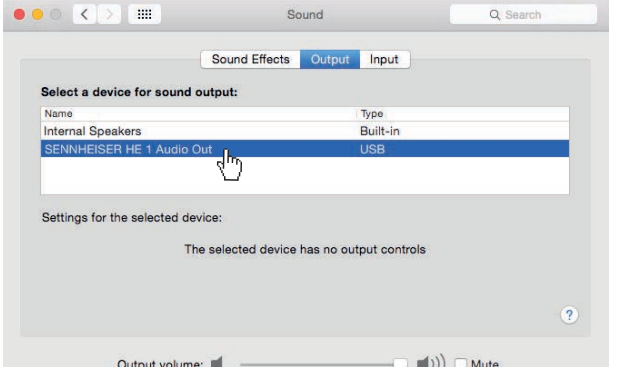
Notes on DSD reproduction

Information on the possible configuration options for your Mac or PC for native reproduction of DSD music files using third-party software can be found on the HE 1 product page at www.sennheiser.com/download.

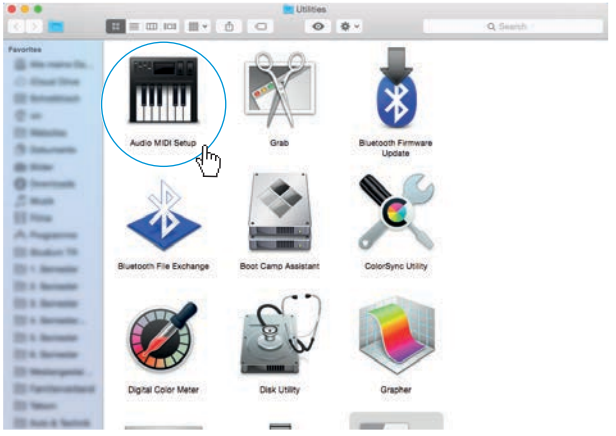
Apple OS X operating system

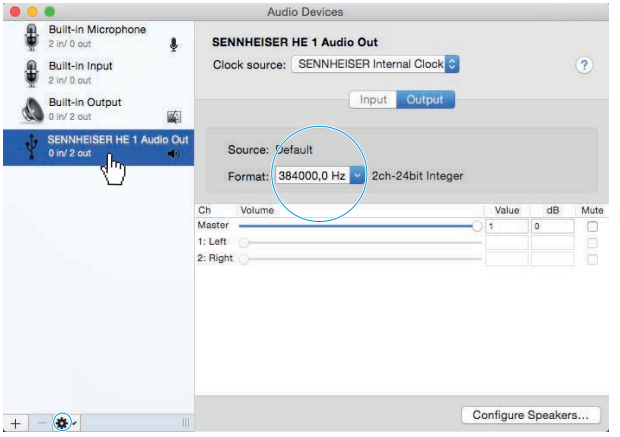
For an Apple Mac OS X operating system from version 10.6 onwards, you do not have to install a driver. The HE 1 is recognized automatically.

▷ From the System Preferences, select "Sound" and then select "Sennheiser HE 1" as the default audio output device.



▷ Open the "Audio Midi Setup" utility program and select "Sennheiser HE 1" from the left-side column.





▷ From the ⚙ drop-down menu, select "Use this device for sound output".

▷ In the device settings, select the maximum sample rate from the "Format" drop-down list. Select "384000 Hz" for the best possible sound quality.

Microsoft Windows operating system

If you use a Microsoft Windows operating system, you have to install USB Audio drivers that come with the "HE 1 USB Audio Software Package". After installation of the drivers, the HE 1 is recognized automatically.

System requirements

- Intel Core 2 processor with 1.6 GHz (minimum) or similar processor
- 2 GB RAM (minimum)
- Microsoft Windows 7/8/8.1/10 operating system (32 or 64 bit)

HE 1 USB Audio Software Package

The software package contains the following components:

- WDM USB audio driver
- ASIO USB audio driver
- Control Panel
- HE 1 Updater

Notes on the USB audio modes

If you use standard software (e.g. Windows Media Player or Apple iTunes), the best possible transmission mode is limited by the operating system (the played music file is mixed with System Sounds and adapted to the sample rate and bit depth set for the WDM driver).

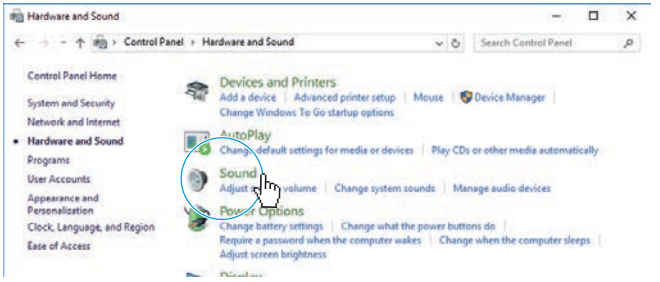
For native reproduction of high-resolution files (without driver-induced adaptation of sample rate and bit depth; 32 bits/up to 384 kHz or DSD files), you require an ASIO driver and special third-party software, which transmits the music file natively from the player software to the DAC of the HE 1 (see page 18).

Example: Microsoft Windows 10

To install the "HE 1 USB Audio Software Package" and to set the HE 1 as the default audio output device:

▷ Install the "HE 1 USB Audio Software Package" from the USB flash drive (supplied). The software package can also be downloaded from the Internet at www.sennheiser.com/download or be obtained from your Sennheiser partner. You need administrator rights for installation.

▷ Open the Control Panel and select "Sound".

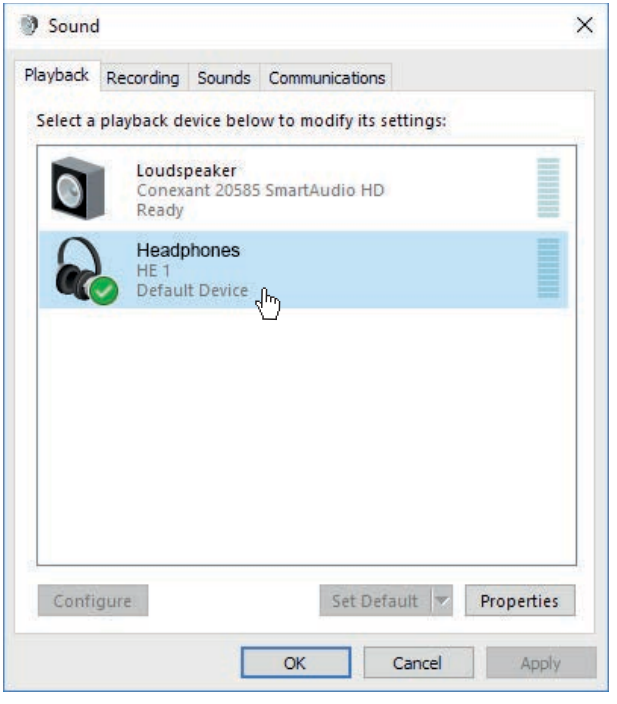


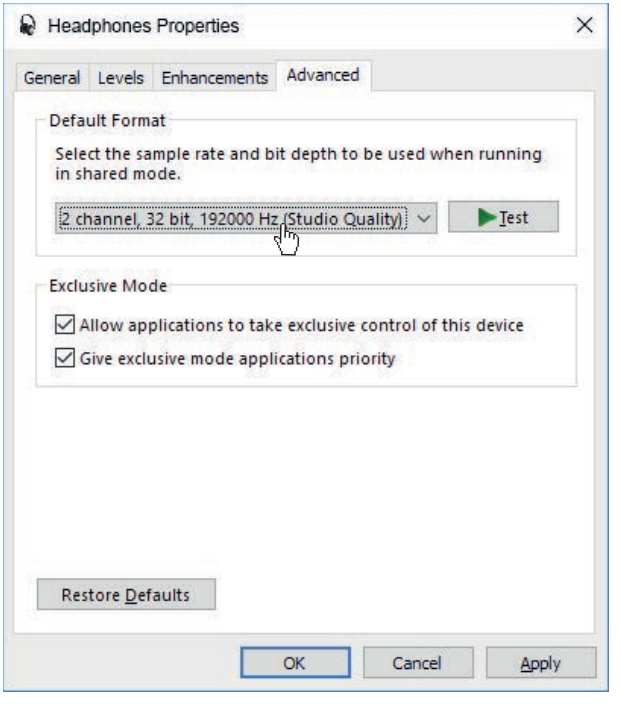
The "Sound" window opens.

▷ Select "HE 1" as the default audio output device.

▷ Click on "Properties" and, in the "Advanced" tab, select the maximum sample rate from the "Default Format" drop-down list. Select "32 bit, 192000 Hz (studio quality)" for the best possible sound quality.

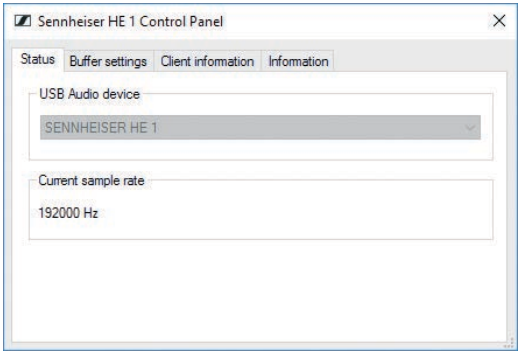
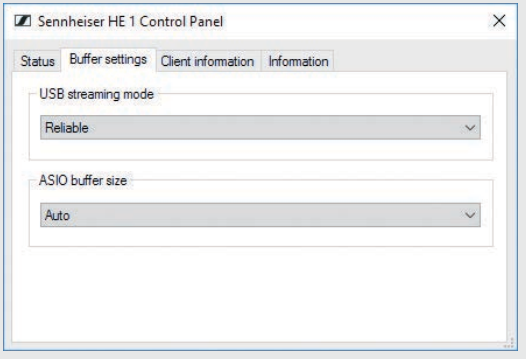
▷ Click on "OK" to apply the settings.

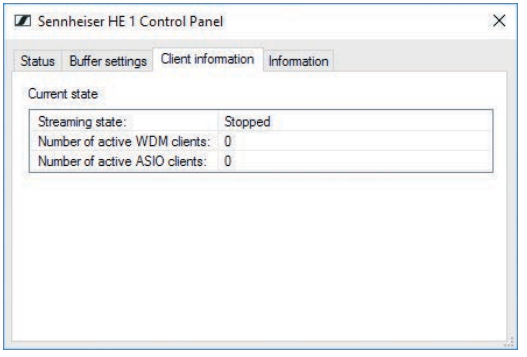
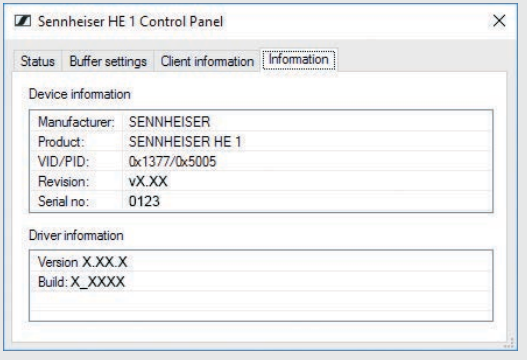




Using the Sennheiser Control Panel

The Control Panel allows you to configure the HE 1 for the reproduction of high-resolution music files and to monitor the current operating state.

Tab	Control Panel view	Display/Setting option
Status		USB Audio device Currently connected and used device. If several devices devices are connected simultaneously, you can select the desired device here.
		Current sample rate PCM: 44100, 48000, 88200, 96000, 176400, 192000, 352800, 384000 Hz DSD: 2822400, 5644800, 11289600 Hz
Buffer settings		USB streaming mode The buffer of the USB streaming mode controls the latency of the music signal from the file source (PC client) and the DAC (HE 1). The lower the latency, the more CPU power the PC client has to allocate to this process. Recommended setting: "Reliable".
		ASIO buffer size The ASIO buffer size controls the data transfer between the driver and the playback software. The ASIO buffer size depends on the buffer of the USB streaming mode. Recommended setting: "Auto".

Tab	Control Panel view	Display/Setting option
Client information		Current state Information on the PC client on which the Control Panel is installed and on the streaming state (''Active'' or ''Stopped''). The type of driver used is displayed via the number of active WDM or ASIO clients.
Information		Device information/Driver information Information on the currently connected device and on the driver.

Connecting the headphone tube amplifier to a power amplifier or to active loudspeakers

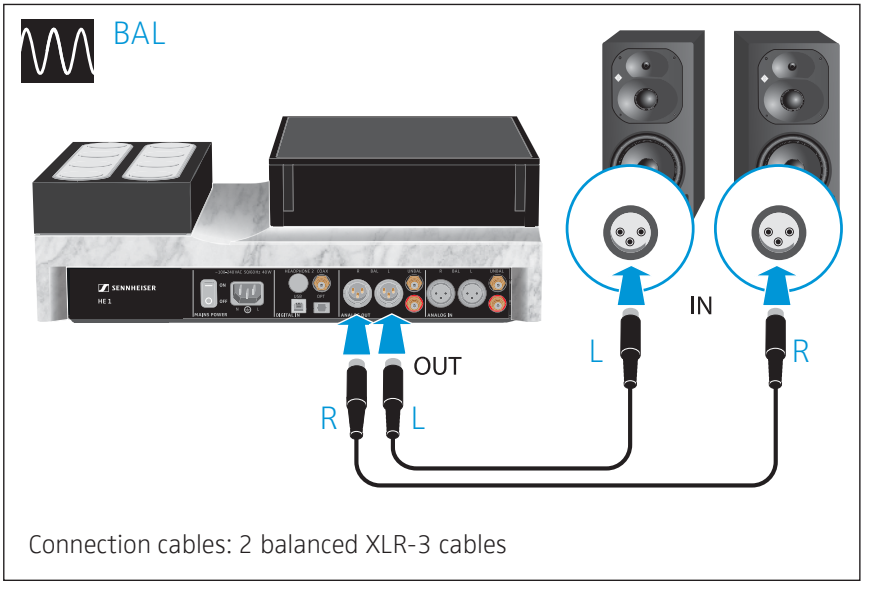
You can use the tube headphone amplifier as a preamplifier and connect it to a power amplifier or to active loudspeakers. To switch the audio output from the headphones to the audio outputs, set the OUTPUT rotary switch to LINE.

- ▷ Switch your audio devices off before connecting the tube headphone amplifier.
- ▷ Select a suitable high-quality connection cable for your audio device. Please observe the recommended maximum cable length as given in the table.
- ▷ To connect the tube headphone amplifier to your audio source, refer to the connection diagram suitable for your your audio source (see the following chapters):

Connection possibility of the audio device:		Connection cable	Max. cable length	Page
ANALOG	A XLR-3 (BAL)	2 balanced XLR-3 cables	10 m	25
	B RCA (UNBAL)	Stereo audio cable with 2 RCA connectors at each end	5 m	25

A

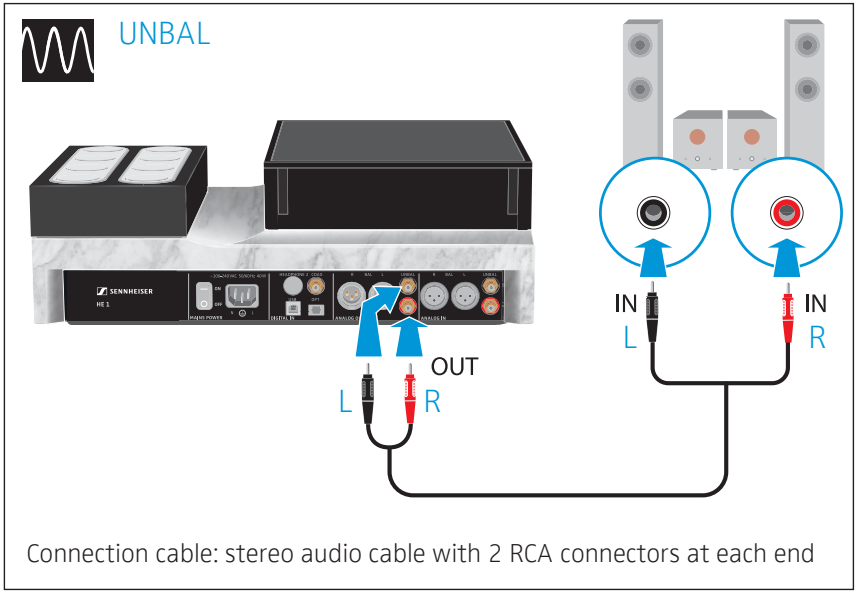
Connection possibility of the audio device: analog, XLR-3, balanced



Connection cables: 2 balanced XLR-3 cables

B

Connection possibility of the audio device: analog, RCA, unbalanced



Connection cable: stereo audio cable with 2 RCA connectors at each end

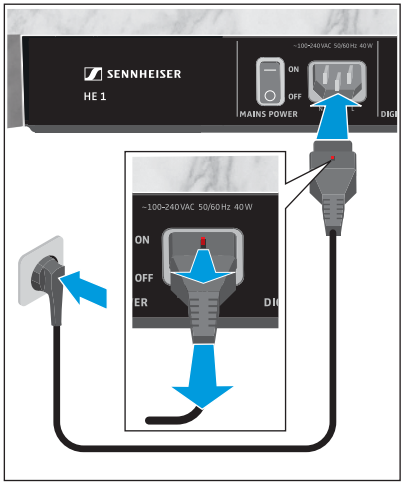
Connecting the tube headphone amplifier to the power supply system

CAUTION

Danger of damage to the product!

If you connect to an unsuitable power supply, the product can be damaged.

▷ Use a suitable power cable (supplied) to connect the product to the power supply system (100 - 240 V~, 50/60 Hz).



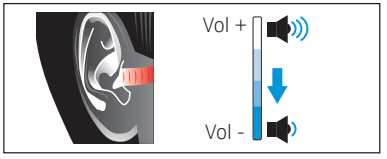
▷ Connect a suitable power cable (supplied for the regions EU, UK or US) to the IEC mains socket and a wall socket.

To disconnect the power cable:

▷ Push and hold the red safety pin on the power plug and pull the power plug from the IEC mains socket.

Using the HE 1

Switching the tube headphone amplifier on

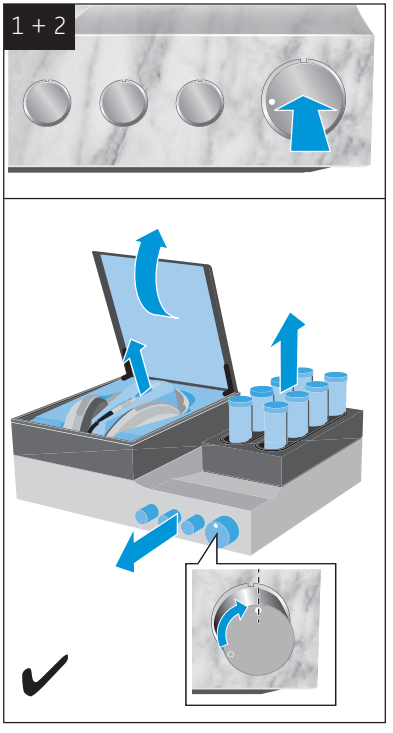


CAUTION

Danger of hearing damage!

Listening at high volume levels for long periods of time can lead to permanent hearing defects. Toggling between the audio sources may cause enormous volume jumps that can permanently damage your hearing.

- ▷ Before putting the headphones on and before switching between audio sources, adjust the volume to a low level.
- ▷ Do not continuously expose yourself to high volume levels.



1. Set the power switch to ON to switch the HE 1 on.
2. Press the on/off button.

Or:

- ▷ Press the ⏻ button on the remote control.

The status LED starts pulsing. The operating elements and the amplifier tubes extend automatically and switch to the last position. The glass cover of the headphone storage box opens. Once the initialization and the warm-up phase of the amplifier tubes is completed, the status LED lights up white. The HE 1 is ready for operation.

ℹ You can adjust the volume for the INPUT audio inputs and the OUTPUT audio outputs according to your needs (see page 33 and 36).

ℹ If the OUTPUT rotary switch is set to LINE, the headphone storage box remains closed when the HE 1 is switched on (see page 35).

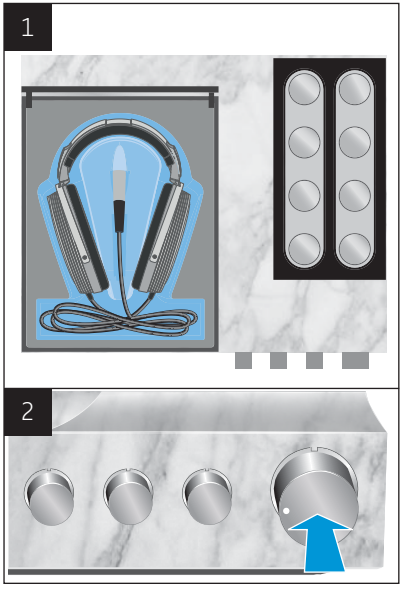
Deactivating the blockage protection

If, during initialization, the operating elements and the amplifier tubes cannot extend automatically because they are blocked or if the glass cover cannot open because it is blocked, the blockage protection will be activated. The status LED flashes red. In this case, the HE 1 cannot be used.

To deactivate the blockage protection of the HE 1:

- ▷ Set the power switch to OFF to switch the HE 1 off and wait until the status LED goes off (up to 30 seconds).
- ▷ Make sure that the operating elements, the amplifier tubes and the glass cover are not blocked.
- ▷ Set the power switch to ON to switch the HE 1 on again.
  It might be that the operating elements retract to the "off" position.
- ▷ Press the on/off button.
  The HE 1 switches on normally (see previous page).

Switching the tube headphone amplifier off



▷ Open the glass cover of the storage box (see page 39) if necessary.

1. Telescope the headband, place the headphones in the headphone compartment and carefully roll up the cable so that it fits completely into the storage box.
2. Press the on/off button.

Or:

▷ Press the ⏻ button on the remote control.

The status LED starts pulsing. The glass cover of the headphone storage box closes. The amplifier tubes and the operating elements retract to the "off" position. Once the switch-off procedure is completed, the status LED lights up red. The HE 1 is switched off (standby).

If, during switch-off of the HE 1 and closing of the glass cover, the cable leaves the storage box or the travel of the glass cover is blocked, the glass cover remains ajar so that e.g. the cable does not get clamped.

If you want to accelerate the switch-off process, press the on/off button for 2 seconds when switching the amplifier off.

To disconnect the HE 1 from the power supply system:

▷ Set the power switch to OFF to switch the HE 1 off.

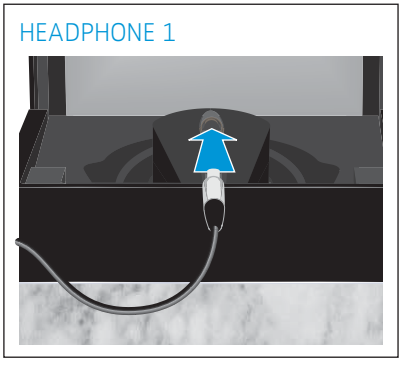
▷ Unplug the power plug from the wall socket.

▷ Push and hold the red safety pin on the power plug and pull the power plug from the IEC mains socket.

Connecting headphones

You can connect up to two Sennheiser *HE 1-HP* electrostatic headphones to the tube headphone amplifier. The volume setting and the selected audio input apply to both headphones.

Connecting headphones



▷ If necessary, open the glass cover of the BOX 1 storage box (see page 39).

▷ Connect the connector of the headphones to the HEADPHONE 1 socket of the amplifier. Make sure that the connector fits properly into the socket.

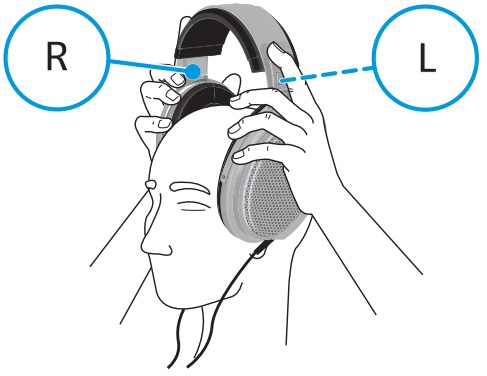
Connecting an additional pair of headphones

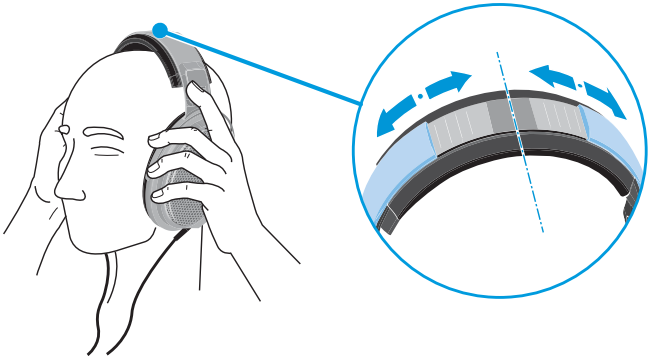
An additional pair of Sennheiser *HE 1-HP* electrostatic headphones is optionally available.

▷ Connect the connector of the headphones to the HEADPHONE 2 socket of the amplifier. Make sure that the connector fits properly into the socket.

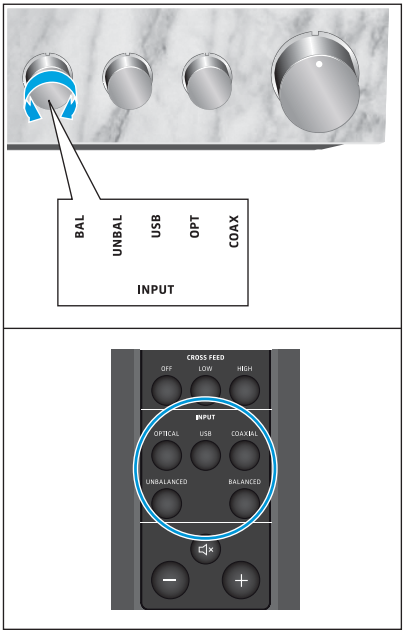
Putting on the headphones

- ▷ Put on your headphones and then pull the ear cups down until they rest comfortably over the ears. Make sure you wear them the right way round by observing the R (right) and L (left) markings on the ear cup bands.
- ▷ For optimum sound quality, ensure that the ear cups are not covered.





Selecting the INPUT audio inputs



▷ Turn the INPUT rotary switch until the desired audio source points to the marking.

Or:

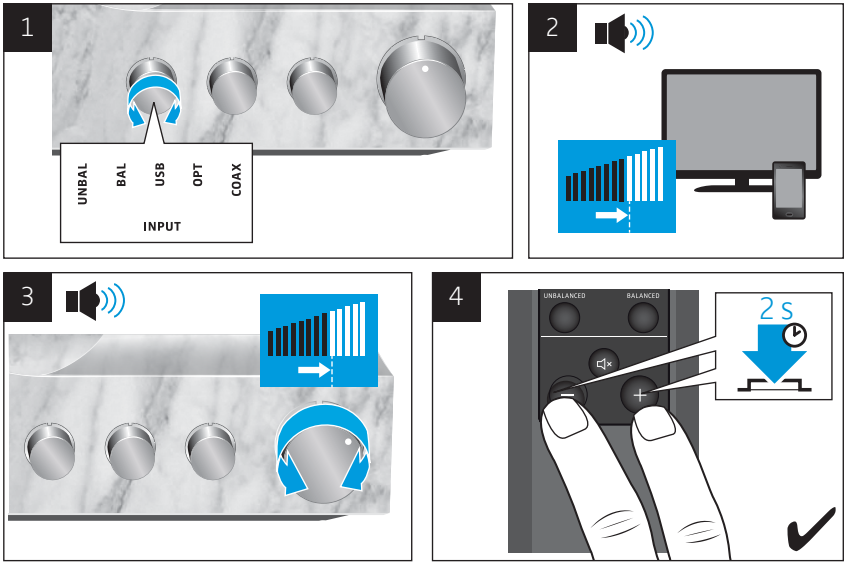
▷ Press the INPUT button on the remote control.

INPUT audio inputs	Selected input on the headphone amplifier
BALANCED / BAL	XLR-3 (analog)
UNBALANCED / UNBAL	RCA (analog)
USB / USB	USB (digital)
OPTICAL / OPT	Optical (digital)
COAXIAL / COAX	Coaxial (digital)

Adjusting the signal levels of the INPUT audio inputs

Depending on the device used or your listening preferences, you can adjust the volume/signal levels of the audio inputs so that e.g. all devices used with the HE 1 are reproduced at the same volume. This allows you to use the complete adjustment range of the volume control for all audio inputs.

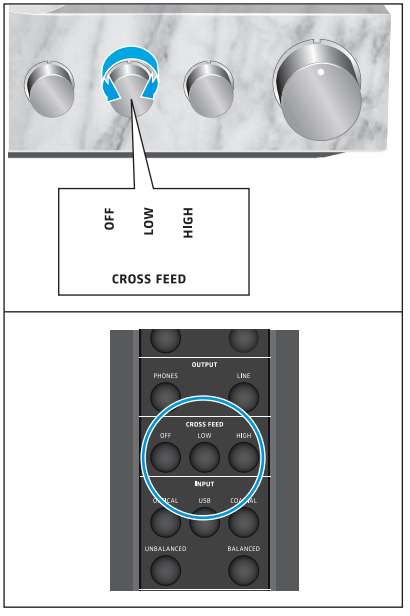
1. Select the desired INPUT audio source and start playing music from the selected device.
2. If your selected device is fitted with an adjustable output (e.g. headphone output), adjust the output volume to at least a medium level.
3. Adjust the listening volume on the HE 1 to a medium level that is comfortable for you. This volume level becomes the reference level for the center position of the volume control.
4. Press and hold the - button and the + button on the remote control for 2 seconds.
   The status LED flashes green. The signal level for the audio input is stored. The volume control automatically returns to the center position so that you can use the complete volume range for the selected device.



Using the crossfeed function

With certain recordings, the bass portion of the music signal is hard-panned to just one of the stereo channels. Some people will find such recordings tiring to listen to using headphones.

This effect can be minimized by activating the crossfeed function of the HE 1. The crossfeed function feeds the bass portion of the music signal to both the right and left stereo channel, thus helping to alleviate excessive stereo separation. This function is only intended for use with headphones. The LINE output remains unchanged.



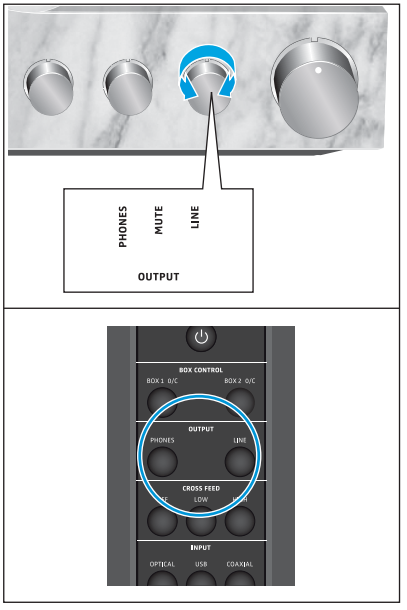
▷ Turn the CROSS FEED rotary switch until the desired setting points to the marking.

Or:

▷ Press the desired CROSS FEED function button on the remote control.

CROSS FEED rotary switch	Function
OFF	The crossfeed function is deactivated. The music recording is reproduced unchanged.
LOW	The crossfeed function is activated, the crossfeed intensity level is low. The bass portion of the music signal is fed to both the right and left stereo channel.
HIGH	The crossfeed function is activated, the crossfeed intensity level is high. The bass portion of the music signal is fed to both the right and left stereo channel and is boosted slightly.

Selecting the OUTPUT audio output



▷ Turn the OUTPUT rotary switch until the desired audio output points to the marking.

Or:

▷ Press the desired OUTPUT function button on the remote control.

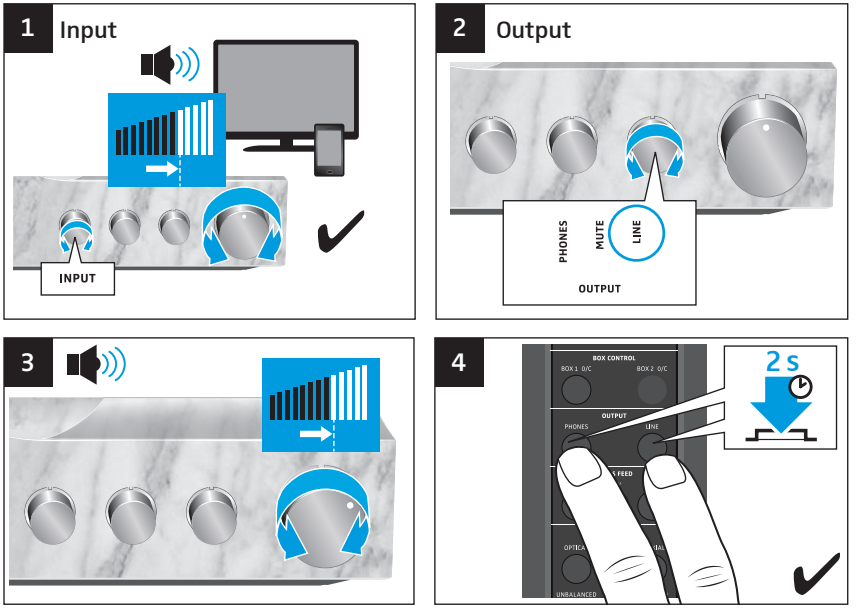
OUTPUT audio output	Selected output on the tube headphone amplifier
PHONES	The *HE 1-HP* electrostatic headphones are selected as the audio output. The headphones are connected to the HEADPHONE 1 socket and/or the HEADPHONE 2 socket.
MUTE	The audio is muted. The status LED pulses.
LINE	A power amplifier or active loudspeakers are selected as the audio output. The devices are connected to the ANALOG OUT sockets.

If the OUTPUT audio output is set to LINE, the headphone storage box remains closed when the HE 1 is switched on. In this case, open the storage box manually (see page 39).

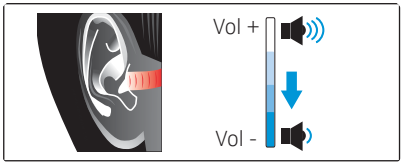
Adjusting the signal levels of the OUTPUT audio outputs

You can increase or reduce the audio output level depending on the power amplifier or the active loudspeakers used. Thus, the complete adjustment range of the HE 1 volume control is maintained and perfectly adjusted to the devices used.

1. Make sure that the signal levels of the INPUT audio inputs are correctly adjusted (see page 33).
2. Set the OUTPUT rotary switch to LINE and start playback.
3. Adjust the volume on the HE 1 to a medium level that is comfortable for you and suitable for your power amplifier or the active loudspeakers used. This volume level becomes the reference level for the center position of the volume control.
4. Press and hold the PHONES button and the LINE button on the remote control for 2 seconds.
   The status LED flashes green. The signal level for the audio inputs is stored. The volume control automatically returns to the center position so that you can use the complete volume range.



Adjusting the volume



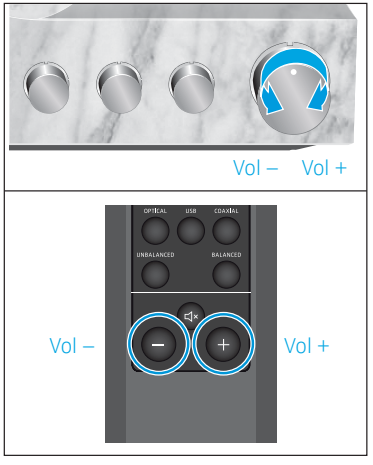
CAUTION

Danger of hearing damage!

Listening at high volume levels for long periods of time can lead to permanent hearing defects. Toggling between the audio sources may cause enormous volume jumps that can permanently damage your hearing.

▷ Before putting the headphones on and before switching between audio sources, adjust the volume to a low level.

▷ Do not continuously expose yourself to high volume levels.



▷ Use the volume control to adjust the desired volume.

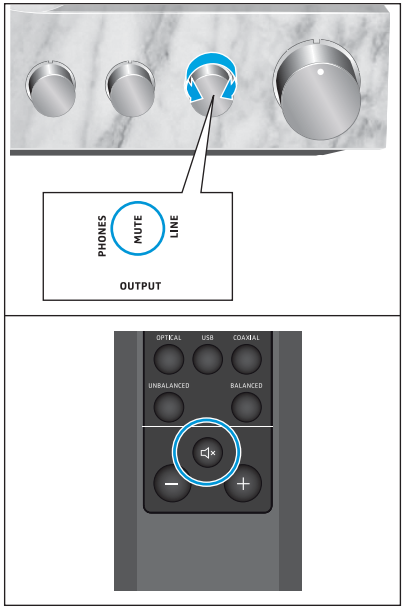
Or:

▷ Press the - button or the + button on the remote control until the desired volume is reached.

The volume setting applies to both the headphones (PHONES) and the audio outputs (LINE). If you have connected two headphones to the headphone amplifier, the volume setting applies to both headphones. The volume/signal levels of the INPUT audio input and OUTPUT audio outputs can be adjusted individually (see page 33 and 36).

Muting the audio

You can mute the headphones and the audio outputs of the tube headphone amplifier:



▷ Turn the OUTPUT rotary switch until MUTE points to the marking.

Or:

▷ Press the button on the remote control.
The audio is muted. The status LED pulses.

To cancel the muting:

▷ Change the volume (see page 37).

Or:

▷ Turn the OUTPUT rotary switch back to the desired output.

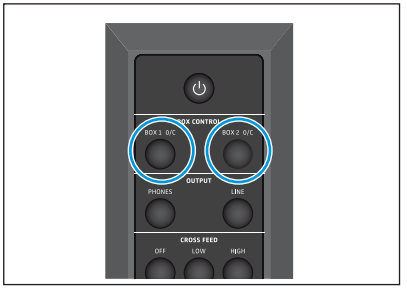
Or:

▷ Press the button on the remote control again or press the desired OUTPUT audio output on the remote control.

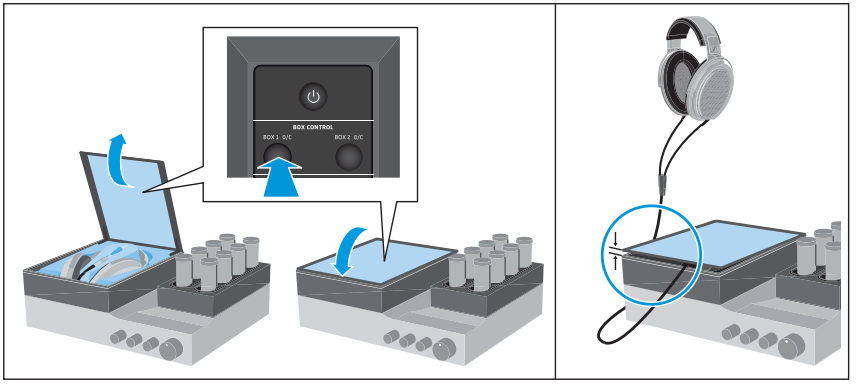
Opening/closing the headphone storage box

The BOX 1 headphone storage box and the optional separate BOX 2 storage box open automatically during switch-on and close automatically during switch-off of the tube headphone amplifier.

To open or close the glass cover of the BOX 1 or BOX 2 storage box during operation:

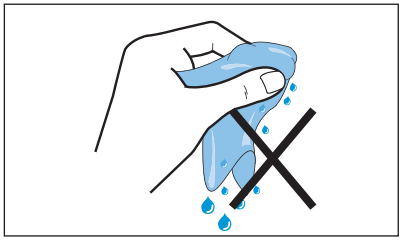


▷ Press the BOX 1 O/C button or the BOX 2 O/C button on the remote control. The glass cover opens or closes. If, during closing of the glass cover, the cable leaves the storage box or the travel of the glass cover is blocked, the glass cover remains ajar so that e.g. the cable does not get clamped.



If the OUTPUT audio output is set to LINE, the headphone storage boxes remain closed when the HE 1 is switched on.

Cleaning and maintaining the HE 1



CAUTION

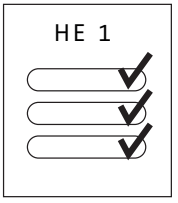
Liquids can damage the electronics of the product!

Liquids entering the housing of the product can cause a short-circuit and damage the electronics.

- ▷ Keep all liquids far away from the product.
- ▷ Do not use any solvents or cleansing agents.

- ▷ Clean the product only with a dry and soft microfiber cloth (supplied).

Servicing the HE 1



We recommend having the product serviced regularly (about every 3 years) to maintain the perfect sound reproduction of the electrostatic headphones and the tube headphone amplifier. Contact your Sennheiser partner to arrange for a complete revision and careful refreshment of the product (see "Contact" on page 4).

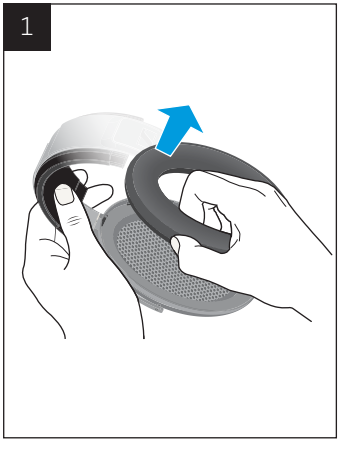
By default, servicing includes the replacement of the ear pads, headband padding and amplifier tubes.

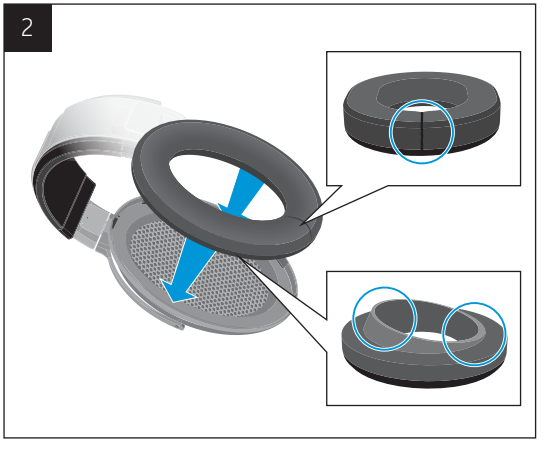
The service card inserted in the cover of this instruction manual provides information on the servicing carried out.

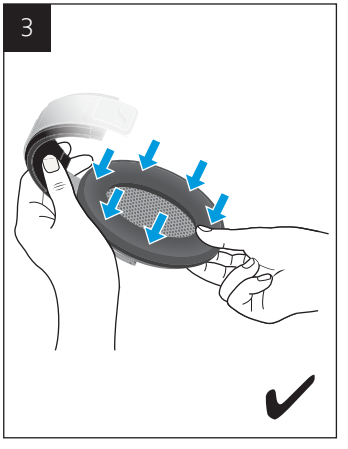
Replacing the ear pads

For reasons of hygiene, you should replace the ear pads from time to time.

1. Grasp behind the ear pad and carefully pull it up and away from the ear cup.
2. Place the new ear pad onto the ear cup. Observe the orientation of the circumferential edge and make sure that the seam points downwards.
3. Attach the ear pad to the ear cup by pressing gently around the ear pad until it locks into place.



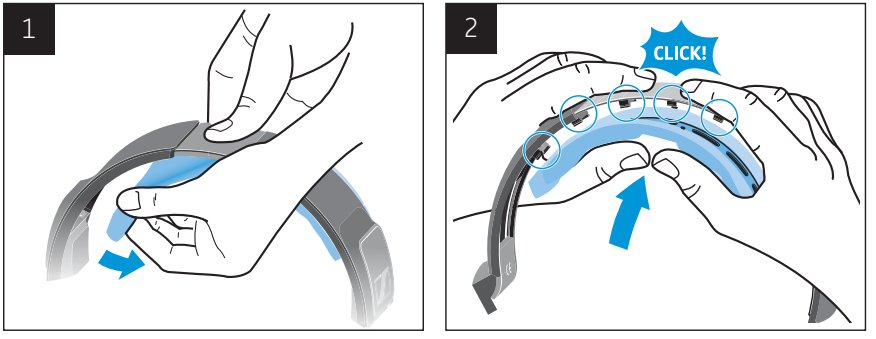




Replacing the headband padding

For reasons of hygiene, you should replace the headband padding from time to time.

1. Hold the headband firmly in the middle and detach the headband padding from one side to the other.
2. Place the new headband padding onto the headband and, starting from the middle and moving outwards, attach it to the headband by pushing on the latches until they click into place.



Replacing the amplifier tubes

The amplifier tubes are consumable elements. The lifetime of the tubes depends on the type and the duration of use. The amplifier's status LED lights up orange when tube replacement is required. Always replace all 8 tubes with new ones. Instructions on tube replacement are enclosed with the tube replacement set or can be downloaded from the Internet at www.sennheiser.com/download.

You can use the amplifier even if a tube replacement is required, but be aware that the sound quality can be reduced.

Replacing the battery of the BFI 1 remote control

If the range of the remote control decreases, you have to replace the battery.

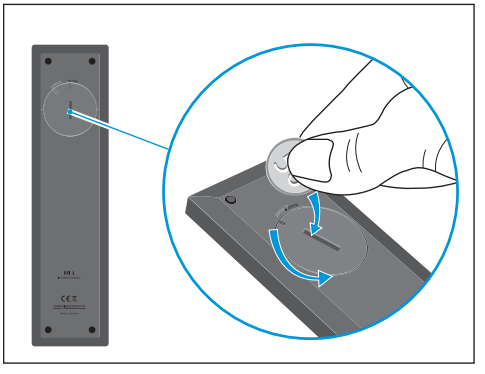
CAUTION

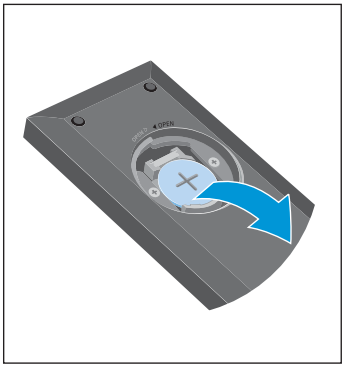
Danger of accidents!

Misuse or swallowing of batteries can cause injuries and health problems.

- ▷ Observe the safety instructions for lithium batteries on page 7.
- ▷ Keep batteries away from children.

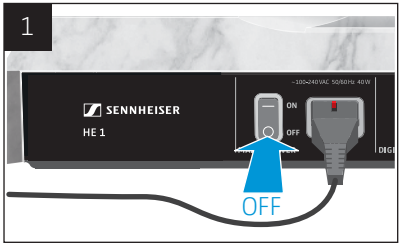
1. Use a suitable object (e.g. a coin) to open the battery compartment cover by turning one turn counter-clockwise.
2. Remove the used battery. In order to protect the environment, dispose of used batteries at special collection points or return them to your specialist dealer.
3. Insert the new battery (type CR2032, 3 V) into the battery compartment. Observe correct polarity when inserting the battery.
4. Close the battery compartment cover by turning one turn clockwise.

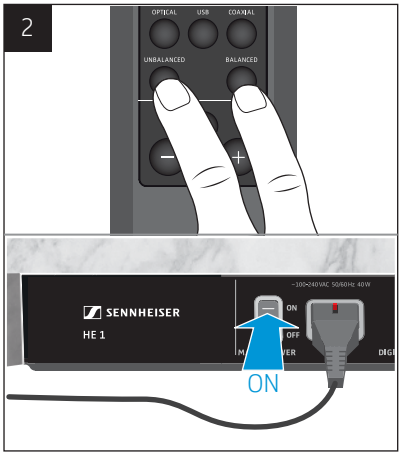




Calibrating the mechanical components

If the mechanical components of the HE 1 are decalibrated (e.g. the rotary switches do not switch correctly, the glass cover does not open or close correctly or the amplifier tubes do not extend or retract correctly), it might be necessary to recalibrate them:





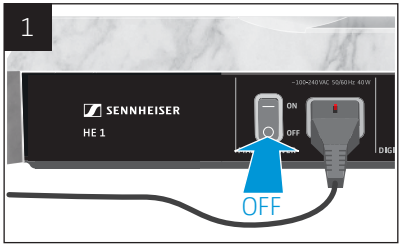
1. Set the power switch to OFF to switch the HE 1 off and wait until the status LED goes off (up to 30 seconds).
2. Simultaneously press the UNBALANCED and the BALANCED button on the remote control and then set the power switch to ON to switch the HE 1 on. The status LED flashes green. The mechanical components are calibrated (the rotary switches switch through all the settings one after the other, the glass cover opens and closes, and the operating elements and the amplifier tubes extend and retract). Once the calibration process is completed, the status LED lights up red. The HE 1 is switched off (standby).

When calibrating the mechanical components, make sure to point the remote control at the remote control sensor located on the front bottom of the amplifier. Otherwise the amplifier switches on normally.

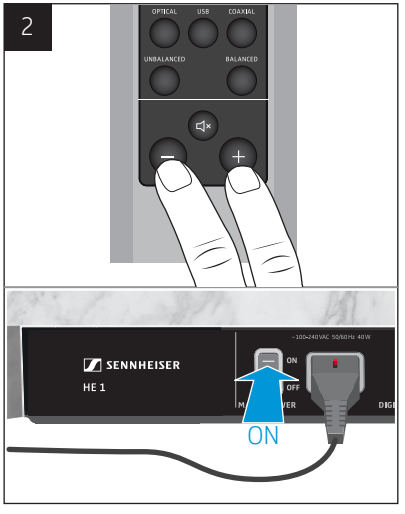
In order to ensure proper functioning of the HE 1, the mechanical components are automatically calibrated at predetermined time intervals. The automatic calibration process starts during switch-off (standby) of the HE 1.

Restoring the factory default settings

To reset all individually stored signal levels of the INPUT audio inputs and OUTPUT audio outputs and the last settings used to the factory default settings:



1. Set the power switch to OFF to switch the HE 1 off and wait until the status LED goes off (up to 30 seconds).
2. Simultaneously press the - and the + button on the remote control and then set the power switch to ON to switch the HE 1 on.
   The status LED flashes green. All settings are reset to the factory default settings. Once the process is completed, the status LED lights up red. The HE 1 is switched off (standby).



When restoring the factory default settings, make sure to point the remote control at the remote control sensor located on the front bottom of the amplifier. Otherwise the amplifier switches on normally.

Installing firmware updates

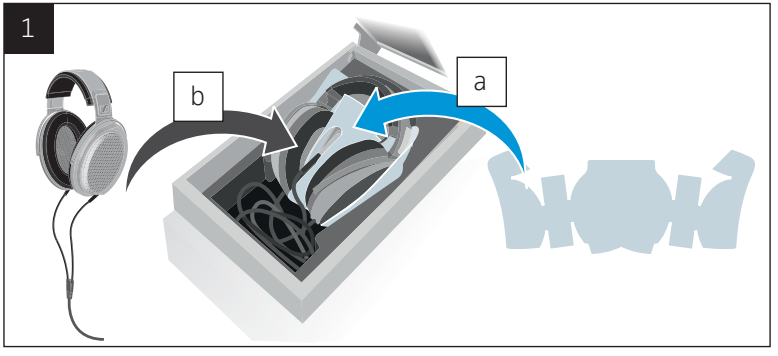
The DAC (digital-to-analog converter) firmware can be updated using the free of charge "Sennheiser HE 1 Updater" program. The program be downloaded from the Internet at www.sennheiser.com/download or be obtained from your Sennheiser partner. The program is available for Windows and Mac operating systems.

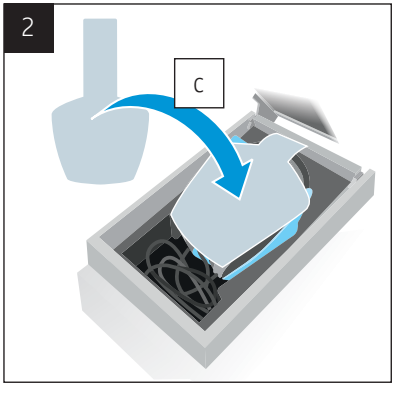
- ▷ Make sure that the HE 1 is connected to your Mac or PC via USB and that it is switched on.
- ▷ From Windows or MacOS, start the "Sennheiser HE 1 Updater" program and follow the instructions on the screen.
  The program automatically checks if the new DAC firmware is compatible with your HE 1. If this is the case, the program guides you through the installation steps and then confirms successful installation.

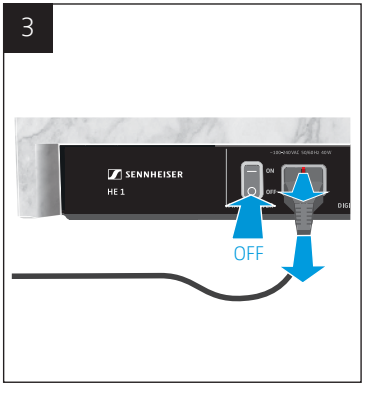
Transporting the HE 1

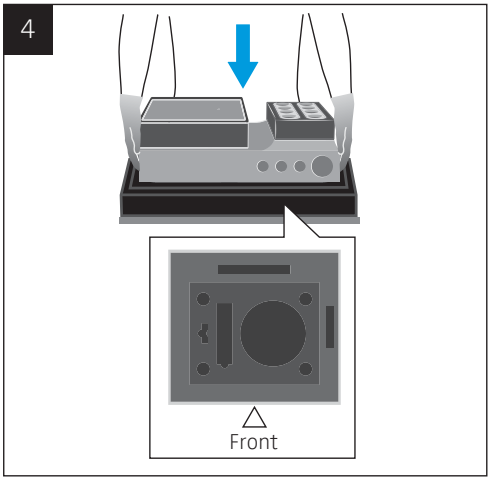
Use the original packaging or contact your Sennheiser partner to arrange for the transport of the HE 1 (see "Contact" on page 4).

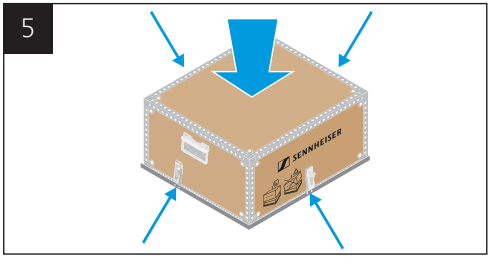
1. Place the foam protection **a** (supplied) in the headphone compartment. Place the headphones **b** onto the foam protection. Roll up the cable so that it fits completely into the storage box and connect the connector of the headphones to the connection socket.
2. Place the foam protection **c** onto the headphones.
3. Switch the HE 1 off as normal and then disconnect all cable connections.
4. Place the HE 1 on the base plate of the transport box as shown.
5. Place the lid of the transport box on the base plate and close all 4 clip locks.











If a problem occurs ...

Problem	Possible cause	Corrective action	Page
The headphones cannot be switched on	No connection to the power supply system.	Check if the HE 1 is connected to the power supply system and if the power switch is set to ON.	26
	The power fuse has blown.	Contact your Sennheiser partner.	–
No audio signal	The HE 1 is switched off.	Switch the HE 1 on.	27
	The volume is adjusted to low.	Increase the volume.	37
	The mute function (MUTE) is activated.	Deactivate the mute function.	38
	The INPUT rotary switch is set to a different audio source.	Set the INPUT rotary switch to the desired audio source.	32
No audio signal when a digital audio source is connected	The data format of the digital audio source is not PCM.	Set the audio source to PCM data format.	16
The audio signal is very low or distorted when an analog audio source is connected	The volume of the audio signal on the audio source is adjusted too low or too high.	If possible, adjust the volume of the audio signal on the audio source to a medium level.	–
	The signal level of the INPUT audio input is adjusted too low/ too high.	Increase or reduce the signal level of the INPUT audio input.	33
Cracking noise occurs when the headphones are put on	This is no malfunction – the cracking noise occurs due to a temporary overpressure in the ear cups.	Pressure compensation is performed automatically within approx. 2 seconds. The headphones are then fully operational.	–
Audio signal only on one ear	The analog audio cable is not properly connected.	Properly connect the audio cable to the playback device.	15
	One tube is defective.	Replace the tubes or contact your Sennheiser partner.	42
The PC does not recognize the HE 1 as the audio output device	No driver is installed.	Install the USB Audio driver.	20
No audio signal when the HE 1 is connected to a PC via USB	Another audio output device is selected.	Select "Sennheiser HE 1" as the audio output device.	18
	No driver is installed.	Install the USB Audio driver.	20
Sound dropouts when connected via USB	The USB cable is not sufficiently shielded.	Use a USB cable that is at least USB 2.0 certified.	16

Problem	Possible cause	Corrective action	Page
The bass reproduction is very powerful	The crossfeed function is set to HIGH.	Set the crossfeed function to LOW or OFF.	34
The storage box does not open after switch-on	The OUTPUT rotary switch is set to LINE.	Set the OUTPUT rotary switch to PHONES.	35
	The separate headphone storage box is connected to the HEADPHONE 1 socket.	Only connect the separate headphone storage box to the HEADPHONE 2 socket.	30
The remote control does not function properly or has a limited range.	The battery is exhausted.	Replace the battery.	43
	A lot of sunlight/extraneous light (fluorescent lamps with electronic control gear) can reduce the range of the remote control.	Do not expose the HE 1 to direct sunlight/extraneous light.	–
The rotary switches do not switch to the desired setting, the glass cover and/or the amplifier tubes do not close flush	The rotary switches are/glass cover is/amplifier tubes are decalibrated.	Start the calibration of the mechanical components.	44
During switch-off, the rotary switches switch through all the settings one after the other.	This is no malfunction – the rotary switches are automatically recalibrated after approx. 500 hours of operation.	Once the calibration process is completed, the HE 1 switches off (standby).	–
The signal level of the INPUT audio inputs cannot be adjusted, the status LED lights up red.	The volume control is set to minimum (turned fully to the left).	Increase the volume to adjust the signal level.	33
The HE 1 does not react to any operation	The function of the HE 1 is faulty.	Disconnect the HE 1 from the power supply system and switch it on normally once the LED has gone off (up to 30 seconds).	27
		Reset the HE 1 to the factory default settings.	45

If a problem occurs that is not listed in the above table or if the problem cannot be solved with the proposed solutions, please contact your Sennheiser partner for assistance (see "Contact" on page 4).

High-voltage protection

In order to best protect you, the high voltage of the electrostatic headphones and tube headphone amplifier is permanently monitored at the transducers, cables and connections. If irregular values are observed, the high-voltage protection is activated immediately and the voltage is cut off. The status LED flashes red quickly two times. In this case, the HE 1 cannot be used.

Should the high-voltage protection be activated, proceed as follows to deactivate it:

- ▷ Set the power switch to OFF to switch the HE 1 off and wait until the status LED goes off (up to 30 seconds).
- ▷ Make sure that there is no moisture on or in the product, that no objects touch the transducers and that the cables are in perfect condition.
- ▷ Set the power switch to ON to switch the HE 1 on again.
  It might be that the operating elements retract to the "off" position.
- ▷ Press the on/off button.
  The HE 1 switches on normally.

If the high-voltage protection is still activated, please contact your Sennheiser partner (see "Contact" on page 4).

Specifications

HE 1-HP headphones

Transducer principle	electrostatic, push-pull principle
Acoustic operating principle	open
Ear coupling	circum-aural
Contact pressure	4.3 N ± 0.3 N
Frequency characteristic	diffuse field equalized
Frequency response	8 – 80,000 Hz (-3 dB) 4 – 100,000 Hz (-10 dB)
Max. sound pressure level	114 dB SPL
THD	< 0.01 % (1 kHz, 100 dB SPL)
Connection cable	silver-plated, oxygen-free copper cable (OFC), balanced, shielded, PTFE insulated, 3 m
Connector	9-pin HV connector
Operating voltage	780 V DC
Polarization voltage	650 V
Max. input level	20 dBV
Weight (without cable)	approx. 550 g
Temperature range	operation: +10 °C to +40 °C storage: -20 °C to +70 °C
Relative air humidity (non-condensing)	operation: 20 to 85 %, storage : 10 to 95 %

HVE 1 tube headphone amplifier

Max. ouput level	20 dBV
Frequency response	5 – 110,000 Hz (-3 dB) 3 – 180,000 Hz (-10 dB)
THD	typ. 0.01 % (1 kHz, 6 dBV)
Inputs	Analog BAL: XLR-3 Analog UNBAL: RCA Digital USB: USB Type B Digital OPT: TOSLINK Digital COAX: RCA
Outputs	for ***HE 1-HP*** headphones: 9-pin HV socket for separate HEADPHONE 2 storage box: 9-pin HV socket Analog BAL: XLR-3 Analog UNBAL: RCA
Weight	approx. 21 kg
Dimensions (W x H x D)	closed: approx. 434 x 160 x 350 mm open: approx. 434 x 405 x 375 mm
Temperature range	operation: +10 °C to +40 °C storage: -20 °C to +70 °C
Relative air humidity (non-condensing)	operation: 20 to 85 %, storage : 10 to 95 %

Power supply

Voltage range	100 – 240 V ~, 50/60 Hz
Power consumption	40 W

Analog input (XLR-3)

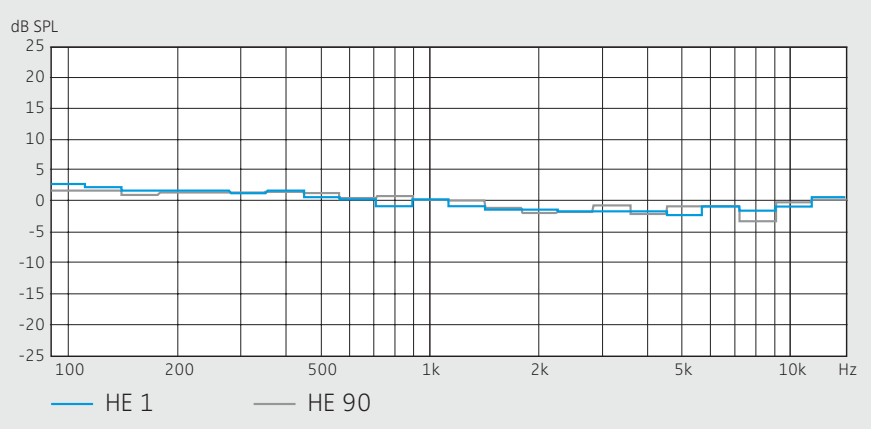
Min. input level (full scale)	-6 dBV
Max. input level	24 dBV
Input resistance	40 kΩ

Analog input (RCA)	
Min. input level	-6 dBV
Max. input level	18 dBV
Input resistance	20 kΩ
Digital inputs (coaxial/optical)	
Standard	S/PDIF
Supported data streams	PCM
Supported sample rates	coaxial/optical: 44.1; 48; 88.2; 96 kHz coaxial: 176.4; 192 kHz
Digital input (USB Type B)	
USB standard	min. USB 2.0
USB audio class	USB Audio Class 2
Supported file formats	PCM: 32 bits, 44.1; 48; 88.2; 96; 176.4; 192; 352.8; 384 kHz DSD: 64 (2,822,400 Hz), 128 (5,644,800 Hz), 256 (11,289,600 Hz)
Analog output (XLR-3)	
Max. output level	4 dBV
Output impedance	1 kΩ
Analog output (RCA)	
Max. output level	4 dBV
Output impedance	1 kΩ

BFI 1 remote control

Transmission	infra-red
Range	approx. 6 m
Power supply	coin cell, type CR2032, 3 V

Reference diffuse-field frequency response curve



Explanations on the diffuse-field frequency response curve

In an anechoic chamber, 8 highly linear loudspeakers emit noise signals independently of each other. In the central area of the chamber, the various sound data meet and are superimposed on each other to form a diffuse field, in which it is no longer possible to determine from which direction the sound is coming. This noise is then varied in distances of a third and reproduced alternately over the speakers and the headphones to be measured. A large number of test persons then evaluate the difference in volume between the room noise and the noise in the headphones.

The ideal state is when the volume impression between the diffuse field and the headphones is the same. Diffuse-field equalized headphones provide a clearly more spatial impression and make it easier to determine whether sounds are coming from the front or rear. Put simply: The sound events take place outside the head and are not confined to the space between the ears.

Manufacturer Declarations

Warranty

Sennheiser electronic GmbH & Co. KG gives a warranty of 5 years on this product.

For the current warranty conditions, please visit our web site at www.sennheiser.com or contact your Sennheiser partner.

FOR AUSTRALIA ONLY

Sennheiser goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure. This warranty is in addition to other rights or remedies under law. Nothing in this warranty excludes, limits, or modifies any liability of Sennheiser which is imposed by law, or limits or modifies any remedy available to the consumer which is granted by law.

To make a claim under this warranty, contact Sennheiser Australia Pty Ltd, Unit 3, 31 Gibbes Street Chatswood NSW 2067, Australia; Phone: (02) 9910 6700, email: service@sennheiser.com.au.

All expenses of claiming the warranty will be borne by the person making the claim.

The Sennheiser International Warranty is provided by Sennheiser Australia Pty Ltd (ABN 68 165 388 312), Unit 3, 31 Gibbes Street Chatswood NSW 2067 Australia.

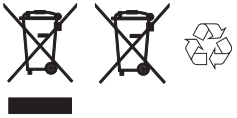
In compliance with the following requirements

CE

EU declaration of conformity

- EMC Directive (2014/30/EU)
- ErP Directive (2009/125/EC)
- Low Voltage Directive (2014/35/EU)
- RoHS Directive (2011/65/EU)

The declaration is available at www.sennheiser.com/download.



Notes on disposal

- WEEE Directive (2012/19/EU)
- Battery Directive (2006/66/EC & 2013/56/EU)

The symbol of the crossed-out wheeled bin on the product, the battery/rechargeable battery and/or the packaging indicates that these products must not be disposed of with normal household waste, but must be disposed of separately at the end of their operational lifetime. For packaging disposal, please observe the legal regulations on waste segregation applicable in your country.

Further information on the recycling of theses products can be obtained from your municipal administration, from the municipal collection points, or from your Sennheiser partner.

The separate collection of waste electrical and electronic equipment, batteries/rechargeable batteries and packagings is used to promote the reuse and recycling and to prevent negative effects caused by e.g. potentially hazardous substances contained in these products. Herewith you make an important contribution to the protection of the environment and public health.

Trademarks and licenses

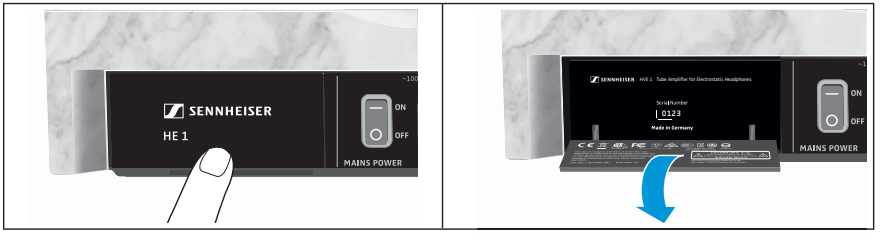
Sennheiser is a registered trade mark of Sennheiser electronic GmbH & Co. KG.

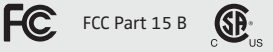
Other product and company names mentioned in this instruction manual may be the trademarks or registered trademarks of their respective holders.

Type plate and approval numbers

The type plate can be found on the rear of the amplifier behind a hinged cover.

▷ Lightly press the lower part of the cover to open it.



Country/region	Compliance
Europe	
USA	 FCC Part 15 B
Canada	CAN ICES-3(B)/NMB-3(B)
Australia/ New Zealand	
Republic of Korea	**MSIP-REM-SE9-HE1** 제품명 : Electrostatic Audiosystem 모델명 : HE 1 정격입력: ~100-240 VAC, 50/60 Hz, 40 W 제조자명 : Sennheiser electronic GmbH & Co. KG 제조국 : 독일 (Germany) A/S 연락처 : 1544-1699 주의사항 : 임의로분해하지마십시요 주의 또는 경고 문구 (Caution or Warning) - 콘센트에 삽입된 플러그에 무거운 물건을 올리거나, 힘을 가하지 말 것. - 습기가 많은 장소 및 물이 튈 염려가 있는 장소에서 사용하지 말 것. - 젖은 손으로 플러그를 만지지 말 것. - 교체 가능 부위를 제외하고 분해 및 개조하지 말 것. - 제품에 충격을 주지 말 것. - 입력과 상호연결 케이블을 반드시 확인하고 기기에 연결할 것. - 제품의 환기구를 덮지 말 것.
China	仅适用于海拔2000m 以下地区安全使用 HE 1 CR2032
Japan	

Statements regarding FCC and Industry Canada
Déclaration requise par la FCC et l'Industrie Canada

FCC Declaration of Conformity (DoC)

SENNHEISER
Model No: HE 1, SD-U16L

We,

Sennheiser Electronic Corporation
One Enterprise Drive • Old Lyme •
CT 06371 • USA
Tel: +1 (860) 434 9190
Fax: +1 (860) 434 1759

declare the above device comply with the requirements of Federal Communications Commission.

This device complies with Part 15 of the FCC rules. Operation is subjected to the following two conditions:
1) This device may not cause harmful interference, and
2) This device must accept any interference received, including interference that may cause undesired operation.

Responsible Party: Michael Lieske

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications made to

this equipment not expressly approved by Sennheiser electronic Corp. may void the FCC authorization to operate this equipment.

Cet appareil est conforme à la Partie 15 des réglementations de la FCC. L'utilisation de l'appareil doit respecter les deux conditions suivantes : (1) L'appareil ne doit pas produire d'interférences nuisibles, et, (2) il doit accepter toutes interférences reçues, y compris celles qui pourraient avoir des effets non désirés sur son fonctionnement. Toute modification non expressément approuvée par Sennheiser electronic Corp. peut annuler le droit de l'utilisateur à l'emploi de l'équipement en question.

China RoHS

部件名称 (Part Name)	有害物质						
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CrVI)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)	产品环保年限 (EFUP)
金属部件 (Metal Parts)	x	o	o	o	o	o	15
电路模块 (Circuit Modules)	x	o	o	o	o	o	15
电缆及电缆组件 (Cables & Cable Assemblies)	x	o	o	o	o	o	15
电路开关 – 如果包含 (Circuit Breakers)	x	o	o	o	o	o	15
电池 – 如果包含 (Battery)	x	o	o	o	o	o	5

本表格依据 SJ/T 11364 的规定编制。

o: 表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。

x: 表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。