



▶▶ NEUMANN.BERLIN

▶ KH 805

ACTIVE SUBWOOFER
WITH 2.1 / 0.1 BASS MANAGEMENT™

OPERATING MANUAL
BEDIENUNGSANLEITUNG
MANUAL UTILISATEUR
MANUAL DE OPERACIÓN





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Important safety instructions

1. Read these instructions.
2. Keep these instructions. Always include these instructions when passing the product on to third parties.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Only clean the product when it is not connected to the mains power supply. Clean only with a dry cloth.
7. Always ensure a free air flow around the cooling fins on the rear of the product. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
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 cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where it exits from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus 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 apparatus, when the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. To completely disconnect this apparatus from the AC mains, disconnect the power supply cord plug from the AC receptacle.
16. **WARNING:** To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.
17. Do not expose this equipment to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the equipment.
18. The mains plug of the power supply cord shall remain readily accessible.



Hazard warnings on the rear of the product

The label shown on the right is attached to the rear of the product.



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.

Never open the product or remove the grilles fitted to the product as there is a risk of electric shock. There are no user serviceable parts inside. Refer servicing to your Neumann service partner.



Read and follow the safety and operating instructions contained in the operating manual.





- Installation**
- Ensure that the room in which you use this product is wired in accordance with the local electrical code and checked by a qualified inspector.
 - Only use the product indoors.
 - Do not install the product in hot, humid, or excessively dusty locations, in direct sunlight or in locations where it is exposed to externally generated vibrations.
 - Do not place burning objects (e.g. candles) on top of or near the product.
 - If condensation has formed on the product, e.g. because it was moved from a cold environment to a warm one, allow the product to acclimatize to room temperature before using it.
 - Do not overload wall outlets and extension cables as this may result in fire and electric shock.

High sound pressure levels



WARNING

Danger of hearing damage due to sudden high sound pressure levels!

Audio signals that are present at switch-on of the product or that can be present during operation, can create sudden, very high sound pressure levels which can damage your hearing.

- Always lower the output level of the audio source **before** connecting it to the subwoofer or starting it (pressing “play”).

This subwoofer can be used for commercial purposes. Commercial use is subject to the rules and regulations of the trade association responsible. Neumann, as the manufacturer, is therefore obliged to expressly point out possible health risks arising from use. This subwoofer is capable of producing sound pressure levels exceeding 85 dB(A) SPL. This is the sound pressure corresponding to the maximum permissible level which is by law (in some countries) allowed to affect your hearing for the duration of a working day (8 hours). It is used as a basis according to the specifications of industrial medicine. Higher sound pressure levels and/or longer durations can damage your hearing.

At higher sound pressure levels, the duration must be shortened in order to prevent hearing damage. The following are signs that you have been subjected to excessive sound pressure levels for too long a time.

- You can hear ringing or whistling sounds in your ears.
- You have the impression (even for a short time only) that you can no longer hear high frequencies (temporary threshold shift).

Magnetic fields



WARNING

Interference due to magnetic fields!

This product generates stronger permanent magnetic fields that can interfere with cardiac pacemakers and implanted defibrillators (ICDs).

- Always maintain a distance of at least 4" (10 cm) between the subwoofer and the cardiac pacemaker or implanted defibrillator.

Intended use Intended use of the product includes:

- having read this operating manual, especially the chapter “Important safety instructions”,
- using the product within the operating conditions and limitations described in this operating manual.

“Improper use” means using the product:

- other than as described in this operating manual, or
- under operating conditions which differ from those described herein.

This will invalidate the guarantee.



The KH 805 subwoofer

Thank you for purchasing a Neumann subwoofer. Neumann subwoofers are designed to complement Neumann's extensive range of monitors. They can be used in music, broadcast, and post production studios for tracking, mixing, mastering, and home recording. They can be positioned next to a wall or flush mounted into a wall, and can be mixed freely in multi-channel systems with other loudspeakers and subwoofers from the Neumann Studio Monitor Systems range.

The built-in 2.1 / 0.1 Bass Manager can be used in many ways as there are four routing modes to ensure maximum flexibility when using the subwoofer - see "Uses" below. Fourth order crossovers and flexible acoustical controls allow for seamless system integration and the bass management function can be remotely controlled.

State-of-the-art circuitry design and the specially developed long excursion bass driver have been used to ensure the most accurate sound reproduction possible. Neumann products are designed for longevity so we hope you enjoy many happy years of using this product.

Uses

- Bass extension for loudspeakers
- Increasing the maximum SPL of loudspeakers
- Decreasing harmonic and intermodulation distortion of loudspeakers
- Reproducing the LFE channel
- Reproducing the "Sub" signal of a bass managed multichannel source
- Making a Plane Wave Bass Array™ system
- Working as an extension for KH810, KH870 and KH805 subwoofer systems

Delivery includes

- 1 KH 805 subwoofer
- 3 Mains cables (European, UK and US version)
- 1 Operating manual
- 1 Supplement "Getting Started Quickly"



The current operating manual as well as the supplement "Getting Started Quickly" can also be downloaded from the "Downloads" area on the product page at www.neumann.com.



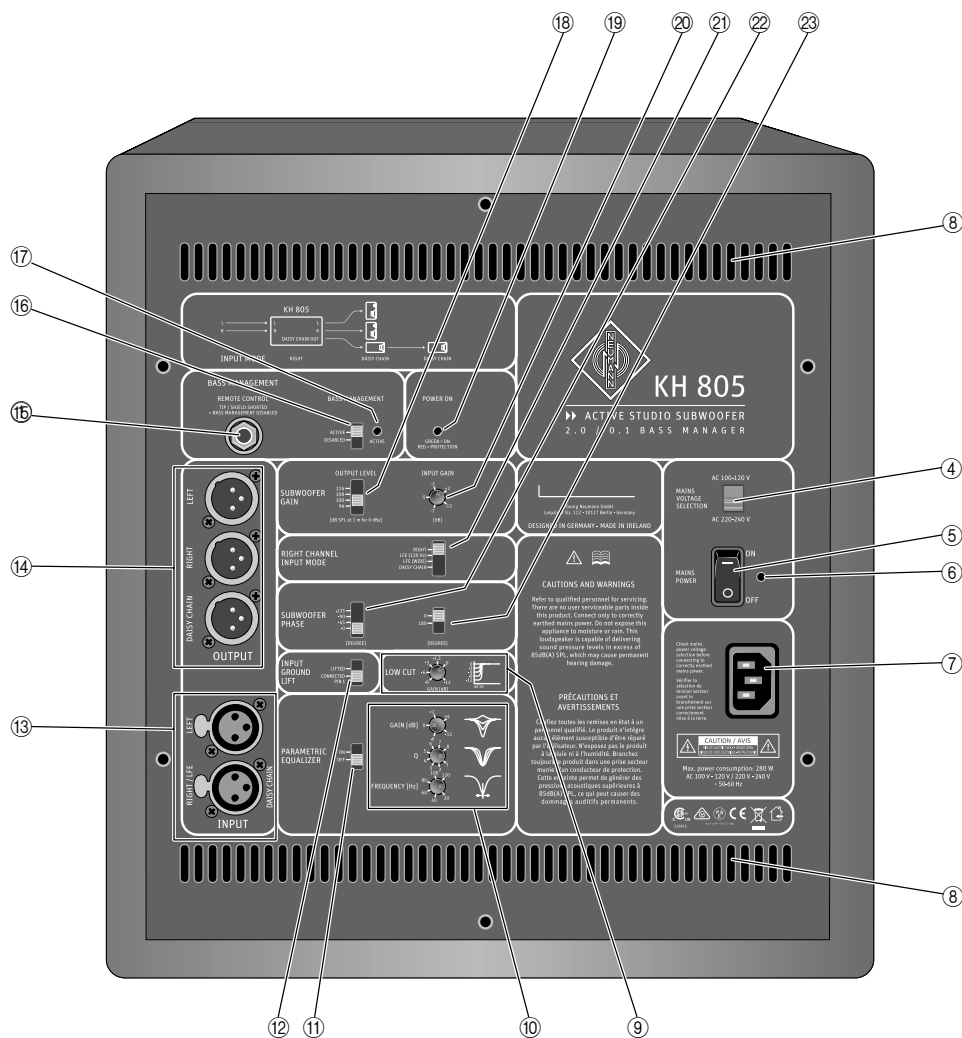
Note that imperial dimensions are approximate.



Product overview



- ① Neumann logo
- ② Metal grille
- ③ Bass reflex ports



- | | |
|---|---|
| ④ MAINS VOLTAGE SELECTION switch | ⑮ REMOTE CONTROL socket |
| ⑤ MAINS POWER switch | ⑯ BASS MANAGEMENT switch |
| ⑥ Grounding point | ⑰ BASS MANAGEMENT LED |
| ⑦ IEC mains socket with protective ground contact | ⑱ SUBWOOFER GAIN OUTPUT LEVEL switch |
| ⑧ Ventilation openings | ⑲ POWER ON LED |
| ⑨ LOW CUT potentiometer | • green = on |
| ⑩ Potentiometers | • red = protection active |
| PARAMETRIC EQUALIZER GAIN | ⑳ SUBWOOFER GAIN INPUT GAIN potentiometer |
| PARAMETRIC EQUALIZER Q | ㉑ RIGHT CHANNEL INPUT MODE switch |
| PARAMETRIC EQUALIZER FREQUENCY | ㉒ SUBWOOFER PHASE switch |
| ⑪ PARAMETRIC EQUALIZER switch | ㉓ SUBWOOFER PHASE switch |
| ⑫ INPUT GROUND LIFT switch | |
| ⑬ Sockets | |
| INPUT RIGHT/LFE/DAISY CHAIN | |
| INPUT LEFT | |
| ⑭ Sockets | |
| OUTPUT DAISY CHAIN | |
| OUTPUT RIGHT | |
| OUTPUT LEFT | |



Installing and connecting the KH 805

Have the product installed and connected by a specialist. Due to his/her technical training, know-how and experience as well as knowledge of relevant provisions, regulations and standards, the specialist must be able to assess assigned tasks, recognize potential hazards and ensure appropriate safety measures. The following safety and mounting instructions are addressed to this specialist.



CAUTION

Danger of injury and material damage due to tipping/dropping of the product!

If improperly mounted, the product and/or the mounting hardware (e.g. rack) can tip over or drop down.

- ▶ Always have the product mounted by a qualified specialist according to local, national and international regulations and standards.
- ▶ Use the mounting systems recommended by Neumann and always provide sufficient additional protection against tipping or dropping by means of safety wires.

CAUTION

Damage to the product due to overheating!

If air cannot circulate properly through the ventilation openings ⑧ on the rear of the product, the power amplifiers may overheat leading to premature activation of the thermal protection system which limits the maximum output level of the subwoofer. In rare cases, damage to the product may also occur.

- ▶ Never cover the ventilation openings ⑧.
- ▶ When installing the product into tight spaces such as wall recesses, maintain an air gap of at least 2" (5 cm) around the subwoofer's backplate to ensure a free air flow through the ventilation openings.



For information on installation, please refer to the supplied "Getting Started Quickly" supplement. This will help you set up the subwoofers and loudspeakers in a way that will give you the best acoustic performance from the system. For further information on setting up subwoofers and loudspeakers, please refer to the "Questions & Answers" section at www.neumann.com.

Preparing the subwoofer

CAUTION

Risk of staining surfaces!

Some surfaces treated with varnish, polish or synthetics may suffer from stains when they come into contact with other synthetics. Despite a thorough testing of the synthetics used by us, we cannot rule out the possibility of staining.

- ▶ Do not place the KH 805 on delicate surfaces.

The bottom of the subwoofer features rubber feet which reduce the risk of scratching the surface and the subwoofer cabinet, and acoustically isolate the subwoofer from the surface.

If you want to hide the subwoofer:

- ▶ Use a thin open weave cloth. To provide visual cover, you can use two layers of the cloth.

Preparing the room

- ▶ Arrange all acoustically relevant surfaces and objects symmetrically on either side of the listening axis of the room (left/right).
- ▶ Minimize the sound that is reflected back to the listening position by using angled surfaces and/or acoustical treatment.



This product has been optimized for use in recording studios. In order to avoid affecting the quality of reproduction, make sure that the product is used in an EMC environment.



Setting up the subwoofers

Choosing the type of set up

The bass reflex ports are located on the front panel of the subwoofer, allowing the subwoofer to be either set up in a room or flush mounted into a wall recess.

Flush mounting the subwoofer into a wall recess offers the following advantages:

- A solid wall boosts the level of the subwoofer in the room which can be compensated by reducing the output level of the subwoofer. This also reduces distortion resulting in a cleaner sound reproduction.
- Reflections from the wall behind the subwoofer are eliminated so that the frequency response becomes smoother.
- The subwoofer does not occupy space in the room.

If you want to flush mount the subwoofer into a wall recess:

- ▶ Have the wall constructed by an experienced acoustical engineer. At least the following points should be observed:
 - The wall should be solid (stone, brick, concrete, several layers of gypsum or MDF).
 - Ensure a free air flow through the ventilation openings ⑧ on the rear of the subwoofer (see warning note on page 7) or remote locate the subwoofer electronics using the Neumann REK 3 remote electronics kit and an SC cable (available in different lengths, see “Accessories” on page 24).

Using one or several subwoofers

- ▶ Use ...

one subwoofer	several subwoofers
... if your room does not offer sufficient space for several subwoofers.	... if you need to move left and right along the mixing console, or if there are several listening positions along a large format mixing console.
	... if you require a higher output power or less distortion with the same output power.
	... to suppress lateral modes or cross modes in the room by means of a Plane Wave Bass Array (PWBA™).
	... if many smaller cabinets are easier to position than one large cabinet.



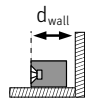
To reduce low-frequency distortion, the uncalibrated output level of your subwoofer should always be higher than the output level of your loudspeakers. We recommend using arrays with several subwoofers, in which case the uncalibrated maximum output level of the subwoofer array should also be higher than the maximum output level of all the loudspeakers in the system. The subwoofers can then be calibrated to a lower output level resulting in lower distortion and correspondingly cleaner low-frequency reproduction.

For information on building a balanced system, please refer to the “Product Selection Guide” at www.neumann.com.



Positioning the subwoofers

Regardless of whether you are setting up one or several subwoofers:



- Always ensure that the distance d_{wall} between the wall behind the subwoofer and the subwoofer's front is less than 0.8 m.

If you are setting up **one** subwoofer:

- Position the subwoofer against the front wall, slightly left or right of the middle of the front wall and between the left and right loudspeakers.

If you are setting up **several** subwoofers as a Plane Wave Bass Array™ (PWBA™):

- Use two to four subwoofers for smaller rooms and three to four subwoofers for larger rooms.
- Set up the subwoofers along the front wall within half a wavelength of each other. The maximum spacing of the subwoofer cabinets is determined by the setting of the routing mode (see page 19):

Setting	Max. spacing of the subwoofer cabinets
RIGHT	approx. 2 m (6'6")
LFE (120 Hz)	approx. 1.4 m (4'6")
LFE (WIDE)	approx. 1.4 m (4'6")
DAISY CHAIN	depends on setting of first subwoofer

If you observe the stated spacing, the subwoofers form a cylindrical source and generate a plane wave down the room, a so-called Plane Wave Bass Array™ (PWBA™). The PWBA™ reduces stationary waves between the side walls, improves the bass reproduction and suppresses lateral room resonances.



For examples of set up positions and distances, please refer to the supplied "Getting Started Quickly" supplement.

You can correct excessive low frequency energy in the room using the potentiometer SUBWOOFER GAIN | INPUT GAIN ⑳ and the switch SUBWOOFER GAIN | OUTPUT LEVEL ⑱ (cf. page 27).

Utilizing the acoustical gain

If you set up several subwoofers, you can utilize their mutual coupling to achieve an acoustical gain. The following acoustical gains are possible:

Number of subwoofers	Acoustical gain
1	0.0 dB
2	6.0 dB
3	9.5 dB
4	12.0 dB



Positioning and orienting subwoofers and loudspeakers

Subwoofers are omni-directional in their typical pass band as the generated wavelength is long compared to the surface producing the sound, therefore it does not matter in which direction the subwoofer is oriented when placed in the listening environment.

For your loudspeakers, however, an accurate positioning and orientation is vital.

- Position your loudspeakers as follows:

System	Position and orientation
2.0 (stereo)	$\pm 30^\circ$
5.1	ITU-R BS.775-1: $0^\circ, \pm 30^\circ, \pm 110^\circ (\pm 10^\circ)$ (center, front left/right, surround left/right) ANSI/SMPTE 202M: $0^\circ, \pm 22.5^\circ$, arrays to the surround left and to the surround right, plus optional subwoofer(s)
6.1	as 5.1 systems plus 180° (back center)
7.1	$0^\circ, \pm 30^\circ, \pm 90^\circ, \pm 150^\circ$ (center, front left/right, side left/right, back left/right)

For detailed information on the positioning and orientation of your loudspeakers, please refer to the operating manuals of the loudspeakers.

If your subwoofers cannot be placed at the same distance from the listening position as the loudspeakers, time-of-flight differences will occur.

- Avoid distance differences of $> 2\text{ m}$ (6'6").
- Compensate for time-of-flight differences as described in the chapter "Calibrating the phase" on page 17.


Connecting the subwoofer

Connecting the subwoofer to an audio source

- Use balanced XLR cables to connect the corresponding sockets INPUT ⑬ of the KH 805 to the audio source.

Connecting unbalanced cables

- Use an XLR adapter (not supplied) to connect unbalanced cables (e.g. RCA cables). Use the following wiring if you want to make your own XLR adapter:

Wiring	Pin	Signal
	1	Audio ground
	2	Signal +
	3	Signal -

The level delivered by devices with RCA outputs (-10 dBV) is usually less than the studio level ($+4\text{ dBu}$):

- If necessary, use active unbalanced-to-balanced converters in order to be able to connect devices with unbalanced signals.



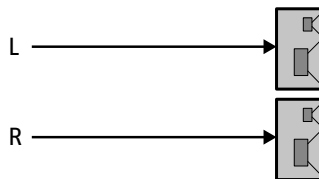
Connecting loudspeakers to the subwoofer

For a simplified representation, the following connection examples show small loudspeakers in combination with the KH 805 subwoofer. Each of the examples only shows one possible combination of loudspeakers and subwoofers. For information on building a balanced system, please refer to the “Product Selection Guide” at www.neumann.com.

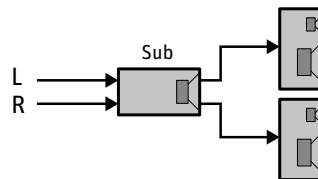
- Use balanced XLR cables to connect the corresponding sockets OUTPUT ⑭ of the subwoofer to the input sockets of the loudspeakers, as shown in the following diagrams.

Stereo systems

Stereo: two loudspeakers

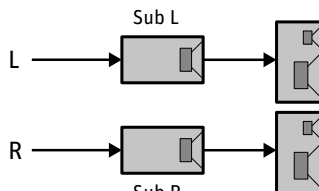


Full range stereo (bass managed): two loudspeakers and one subwoofer



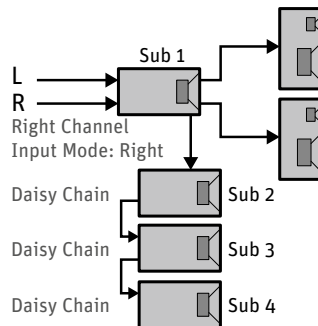
Right Channel Input Mode: Right

Full range stereo: two loudspeakers and stereo subwoofers



Right Channel Input Mode: Right

Full range stereo (bass managed): two loudspeakers and multiple subwoofers



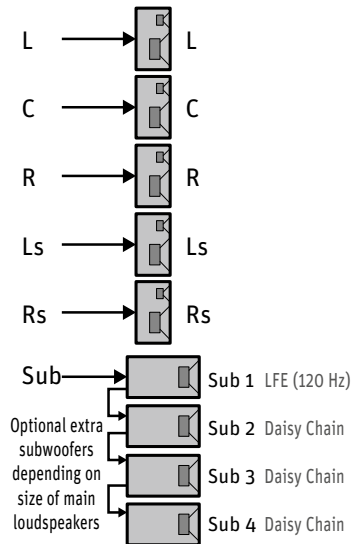
Additional subwoofers can be used for two things:

1. Increasing max SPL below 80 Hz
2. Setting up a Plane Wave Bass Array (many small subwoofers in a line)

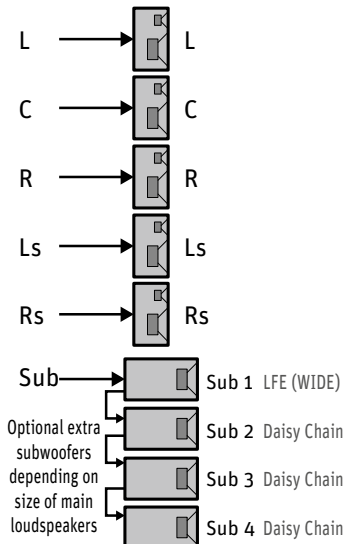


Multichannel systems

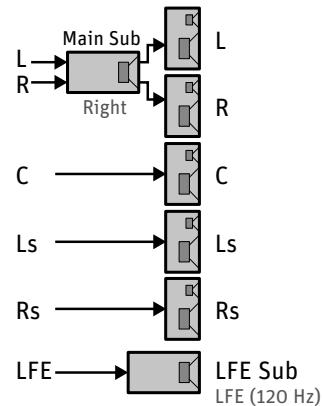
Multichannel system without bass management in the source equipment



Multichannel system with bass management in the source equipment

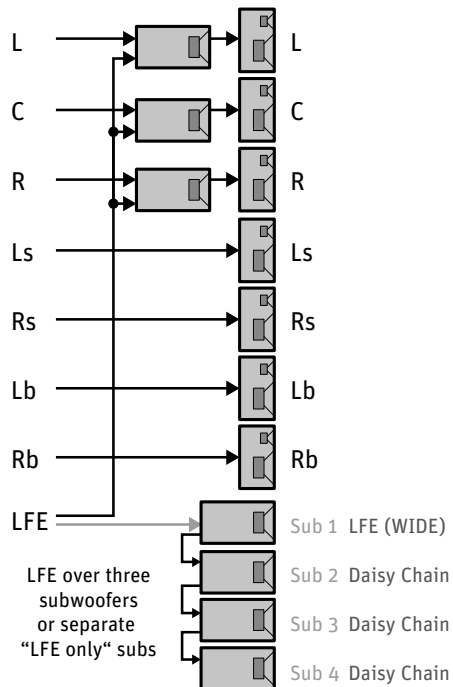


Hybrid bass managed L/R multichannel system

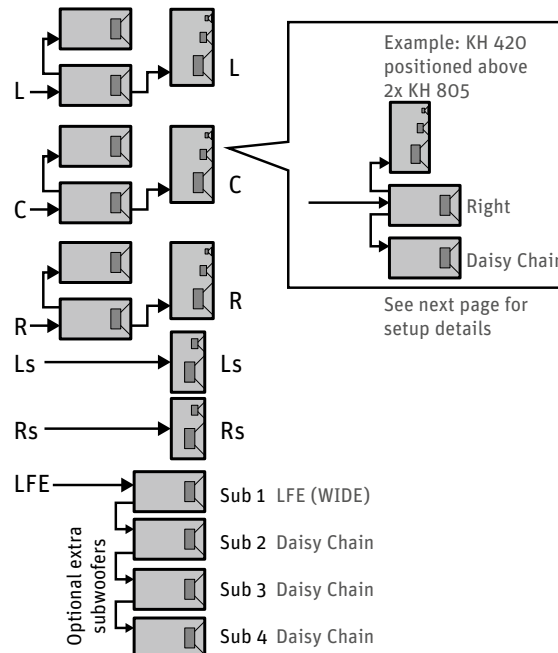


Additional subwoofers can be added to the L/R Sub and/or LFE Sub using the setting "Daisy Chain"

Full range large multichannel system with bass management in the source equipment



Full range large multichannel system



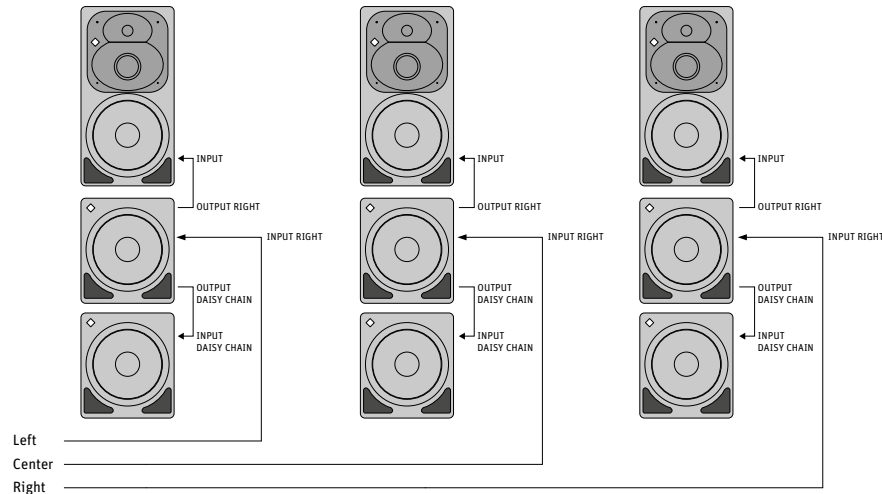
Three subwoofers reproducing one channel adds up to 9.5 dB of acoustical gain which is very close to the 10 dB of gain required for the LFE channel.



Using subwoofers in a 4-way system

To build a larger system:

- Install the subwoofers and loudspeakers like columns:



- Connect the channels Left, Center, Right of your audio source to the subwoofers according to their physical position (see diagram above):
 - Connect the channel Left to the socket INPUT | RIGHT ⑬ of the upper left subwoofer, connect the channel Center to the socket INPUT | RIGHT ⑬ of the upper center subwoofer and connect the channel Right to the socket INPUT | RIGHT ⑬ of the upper right subwoofer.
- Set the switch RIGHT CHANNEL INPUT MODE ⑳ on all three upper subwoofers to RIGHT.
- In each position (left, center, then right), connect the socket OUTPUT | DAISY CHAIN ⑭ of the upper subwoofer to the socket INPUT | DAISY CHAIN ⑬ of the lower subwoofer.
- Set the switch RIGHT CHANNEL INPUT MODE ⑳ on all three lower subwoofers to DAISY CHAIN.

After calibrating the main loudspeakers, the subwoofers should be acoustically calibrated so that they smoothly extend the bass response of their respective main loudspeaker down in frequency from 80 Hz to below 20 Hz. There is no need to adjust the acoustical controls on the lower subwoofers because the acoustical control settings made on the upper subwoofers will be tracked by the lower subwoofers.

Finally, the LFE channel should be routed to the LEFT, CENTER and RIGHT outputs of the source. The level of the LFE channel should then be adjusted in the source to give a 10 dB higher level in the room compared to any one of the main channels.

Alternatively, separate subwoofers can be used to reproduce only the LFE channel.

For a stereo system, leave away the center loudspeaker and subwoofers, and ignore the LFE comment above.

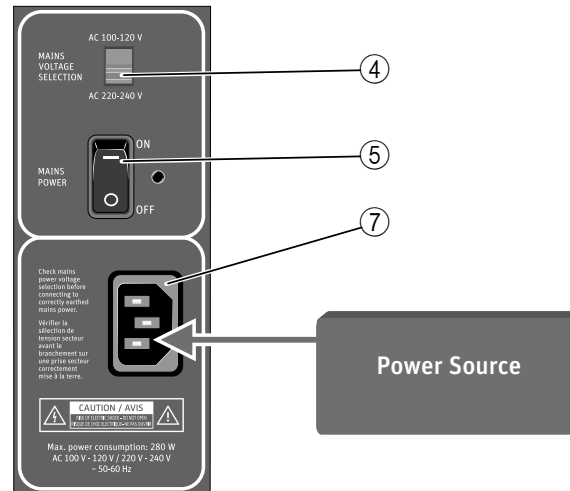
Do not use the subwoofer in parallel to the main loudspeakers by replaying the low frequencies of the signal using both the subwoofer and the main loudspeakers. Doing it this way leads to constructive and destructive interference where the responses overlap due to the different phase responses of the drivers. The result is an uneven bass response in the room, especially if you are moving around. Always connect the subwoofer in one of the ways shown above.



Connecting/disconnecting the subwoofer to/from the mains power supply

To connect the KH 805 to the mains power supply:

- Make sure that the switch MAINS POWER ⑤ is set to “OFF”.
- Make sure that the switch MAINS VOLTAGE SELECTION ④ is set to the correct position:
“AC 100/120 V” if your mains voltage is 100 V or 120 V or
“AC 220/240 V” if your mains voltage is 220 V, 230 V or 240 V.
- Connect the IEC connector of the supplied mains cable to the IEC mains socket ⑦.



- Connect the mains plug of the mains cable to a suitable wall socket.

To disconnect the KH 805 from the mains power supply:

- Set the switch MAINS POWER ⑤ to “OFF”.
- Pull the mains plug out of the wall socket.

Mounting the subwoofer electronics externally

If you distribute the subwoofers around the room but wish to have centralized access to the operating controls of the subwoofer electronics or if you set up your subwoofers so that easy access to the subwoofer electronics is not possible, you can mount the latter externally:

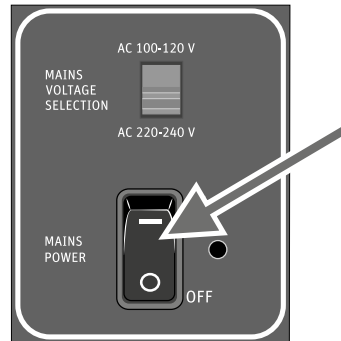
- Use the Neumann REK 3 remote electronics kit together with an SC cable (available in different lengths, see “Accessories” on page 24).
- Proceed as described in the operating manual of the REK 3.



Using the KH 805

Switching the subwoofer on/off

You can switch the KH 805 on and off using the switch MAINS POWER ⑤.



On/off switching
using the switch
MAINS POWER ⑤

- Set the switch MAINS POWER ⑤ to:
 - “ON” to switch the subwoofer on. The LED POWER ON ⑩ lights up red for 3 seconds, during which the subwoofer is muted (see below). The LED POWER ON ⑩ then lights up green.
 - “OFF” to switch the subwoofer off. The LED POWER ON ⑩ goes off.



There is a three second delay before sound can be heard from the KH 805 and the loudspeakers connected to the outputs in order to avoid noises (pops) from preceding equipment switched on at the same time. Conversely, switching off the subwoofer immediately mutes the audio.

Calibrating the subwoofer

Before using your system for the first time and whenever you change the physical conditions in your studio, carry out the following steps:

- Adjust the frequency response and the level of the loudspeakers **before** calibrating the subwoofer (see the operating manual of the loudspeakers):

Application	Recommended frequency response	Comments
Studio	flat	A flat response brings good translation
Film	X-curve shape	Cf. ANSI/SMPTE 202M: the shape of the X-curve depends on the size of the room
Home	subjective evaluation	Not necessarily a flat response, a gently downward sloping response with increasing frequency is often preferred

All the loudspeakers in the system should have the same level at the listening position. This is often measured using a pink noise test signal that is set to -18 dBFS (Europe) or -20 dBFS (USA) on the mixing console's output level meters and a sound level meter set to “C-weighted” and “slow”.




- Calibrate the frequency response, the phase and the acoustical level of the subwoofer.
To do so, choose one of the following methods:
 1. Calibration using an acoustical measurement system
Calibrating the frequency response, phase and sound pressure level by means of an acoustical measurement system should always be your first choice since it yields the highest accuracy. This method is described below.
 2. Calibration using Neumann test signals
In the absence of an acoustical measurement system, you can calibrate the settings of your subwoofer using Neumann test signals (see page 17).
 3. Calibration using music signals and an 80 Hz test signal
A calibration by means of music signals is also possible but should always be the last choice. In this case, play an 80 Hz test signal from your source equipment to calibrate the phase (see page 17).

If you are using several subwoofers, it is possible that the same setting is not valid for all subwoofers.

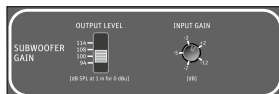
- Calibrate each subwoofer separately.
However, note that daisy chained subwoofers will track the settings on the first subwoofer in the daisy chain.
- If necessary, move the subwoofer and/or the main loudspeakers.
- If necessary, apply acoustical treatment to the source of any reflections.

Calibration using an acoustical measurement system

 The settings of the switch SUBWOOFER GAIN | OUTPUT LEVEL ⑮ and the potentiometer SUBWOOFER GAIN | INPUT GAIN ⑳ recommended in the following table are valid for the following settings of your Neumann loudspeaker: INPUT GAIN: “0 dB” and OUTPUT LEVEL: “100 dB SPL at 1 m for 0 dBu”. For information on how to set your Neumann loudspeaker, please refer to its operating manual. If the mentioned values cannot be set on your loudspeaker, adjust the subwoofer accordingly.

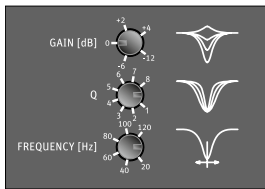
Calibrating the frequency response

The frequency response of a subwoofer depends on its position in the room and on the room geometry. The same subwoofer installed in different positions in the same room may require different acoustical control settings.



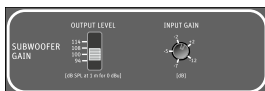
- Adjust the frequency response of the subwoofer at your listening position. To do so, proceed as follows:
- Make sure that the switch SUBWOOFER GAIN | OUTPUT LEVEL ⑮ is set to “100 dB SPL at 1 m for 0 dBu”.
- First, set the potentiometers SUBWOOFER GAIN | INPUT GAIN ⑳ and LOW CUT ⑨ to the following settings. These settings can be used as a starting point for further adjustment:

Subwoofer position	Setting of potentiometer SUBWOOFER GAIN INPUT GAIN ⑳	Setting of potentiometer LOW CUT ⑨
In a corner	–8 dB	–4 dB
Next to or flush mounted in an acoustically solid wall (e.g. brick, concrete)	–4 dB	–2 dB
Next to or flush mounted in an acoustically soft wall (e.g. gypsum)	–2 dB	0 dB
Free standing in an untreated room	–2 dB	0 dB
Free standing in a well-treated room	0 dB	0 dB



- Check the frequency response at the listening position using your acoustical measurement system:
 - In case of acoustical loading in the low frequency range at the listening position, turn the potentiometer LOW CUT ⑨ to the left. This reduces the output level of the subwoofer towards lower frequencies.
 - Use the parametric equalizer ⑩ to compensate for further nonlinearities in the frequency response below 120 Hz caused by room modes and/or reflections.

Calibrating the subwoofer level



- Measure the subwoofer's sound pressure level at the listening position.
- Adjust the sound pressure level of the subwoofer so that the level of the frequency response of the subwoofer below 80 Hz corresponds to the level of the frequency response of the loudspeakers above 80 Hz.
 - To do so, use the potentiometer SUBWOOFER GAIN | INPUT GAIN ⑳ and the switch SUBWOOFER GAIN | OUTPUT LEVEL ⑱. Make sure that the input signal is not too high.


Calibrating the phase



- Set the phase using the left switch SUBWOOFER PHASE ⑳. Values from -180° to -315° can be obtained by setting the right switch SUBWOOFER PHASE ㉓ to " -180° " and by adding the set value of the left switch SUBWOOFER PHASE ⑳.

Example: To obtain a phase shift of -270° , set the right switch SUBWOOFER PHASE ㉓ to " -180° " and the left switch SUBWOOFER PHASE ⑳ to " -90° ".
- Set the left switch SUBWOOFER PHASE ⑳ in combination with the right switch SUBWOOFER PHASE ㉓ to values of 0° , -45° , -90° , -135° , -180° , -225° , -270° , and -315° , until you have found the setting that gives the lowest sound pressure level at the listening position at the cut-off frequency of 80 Hz (180° phase shift between subwoofer and loudspeaker, maximum level cancelation).
- Set the right switch SUBWOOFER PHASE ㉓ to the opposite position. The phase shift between loudspeaker and subwoofer is now 0° . Check your subwoofer's sound pressure level again and, if necessary, readjust it so that it corresponds to the sound pressure level of the loudspeakers.

Your system is now completely acoustically calibrated.

 Note that any change of the low cut and parametric EQ influences the crossover phase. Therefore, the phase and the level need to be recalibrated after changing the low cut or parametric EQ settings.

Calibration using Neumann test signals

- Download the Neumann test signals and the instructions for use (PDF file, in English) from the KH 805 product page at www.neumann.com.
- Follow the steps described there.

Calibration using music signals and an 80 Hz test signal

- Adjust the settings for the sound pressure level and the frequency response as described above.
- Calibrate the acoustical phase using an 80 Hz test signal. Check the settings of the sound pressure level and frequency response by means of music signals you are familiar with.
 - Connect the left front loudspeaker to the socket OUTPUT | LEFT ⑭.
 - Set the switch BASS MANAGEMENT ⑮ to "ACTIVE".
 - Play an 80 Hz test tone from your source into the audio input INPUT | LEFT ⑬ so that the subwoofer and left loudspeaker are playing the tone.
 - Set the rotary switch SUBWOOFER PHASE ⑳ in combination with the switch SUBWOOFER PHASE ㉓ to values of 0° , -45° , -90° , -135° , -180° , -225° , -270° , and -315° , until you have found the setting that gives the lowest sound pressure level at the listening position at the cut-off frequency of 80 Hz (180° phase shift between subwoofer and loudspeaker, maximum level cancelation).
 - Switch off the test signal at the source.
 - Set the switch SUBWOOFER PHASE ㉓ to the opposite position. The phase shift between loudspeaker and subwoofer is now 0° .





- Check the settings of the sound pressure level and frequency response by means of music signals. Listen for a smooth extension of the frequency response of the main loudspeakers down to 20 Hz.

To this, proceed as follows:

- Listen to music containing content down to 20 Hz. Activate and disable the bass management by repeatedly moving the switch BASS MANAGEMENT ⑩ between the two positions. There should be no increase or decrease in level between the lower cut off frequency of the monitor and 80 Hz.

Compensating for larger time of flight (TOF) differences

If the subwoofer is placed at a distance > 2 m (6'6") behind the loudspeakers with reference to the listening position, the subwoofer's integrated compensation settings will not suffice.

Compensating for TOF differences by means of an electronic time delay

- Connect the KH 805 to an electronic time delay. Insert the electronic time delay into the signal path between the sockets OUTPUT ⑭ of the subwoofer and the input sockets of the loudspeakers.
- Compensate for TOF differences using the electronic time delay (see the operating instructions of the delay).
- Alternatively use the D versions of our products with the input select switch set to Analog Delayed, and then make an appropriate setting on the delay switches.

Using the bass management



- For a two-channel stereo system set the switch RIGHT CHANNEL INPUT MODE ⑳ to "RIGHT".
- Set the switch BASS MANAGEMENT ⑩ to "ACTIVE".

The bass management is activated. This inserts a 4th order 80 Hz high pass filter into the signal path of the audio outputs OUTPUT | LEFT and RIGHT ⑭ and routes all audio signals below 80 Hz to the subwoofer. The LED BASS MANAGEMENT ⑪ lights up green.

If you deactivate the bass management, the audio signal of the audio outputs OUTPUT | LEFT and RIGHT ⑭ is only reproduced by the loudspeakers. Use this function to prevent the low frequency signal components of the main channels being reproduced by the subwoofer.

- Set the switch BASS MANAGEMENT ⑩ to "DISABLED".

Remote-controlling the bass management

CAUTION

Material damage due to improper use of cables!

- Do not connect instrument or amplifier outputs to this socket as this could damage the KH 805 and/or the source device.

It is possible to activate and deactivate the bass management filters remotely when the subwoofer is used in a two-channel stereo system setup. This allows one to listen to the source as if there is no subwoofer connected in the system because the loudspeakers play full range with no filtering when the bass management is disabled.

- Set the switch BASS MANAGEMENT ⑩ to "ACTIVE".
- Use a "mono" jack cable to connect a switch to the REMOTE CONTROL socket ⑮. The switch should short the tip and sleeve together to bypass bass management. If the switch has an LED indicator it can be used to show the status of the bass management system because 9 V DC is present on the tip connection of the REMOTE CONTROL socket ⑮. There are some standard footswitches available at music retailers which can be used for this functionality. Make sure to use a switch, as a pushbutton might not work properly.



Note that no audio passes down the remote control cables, only a control signal.



The pin assignment of the socket REMOTE CONTROL ⑮ can be found at the end of this operating manual.



Setting the replay level of the subwoofer

- Right channel input mode:** This mode should be used when the signal has not been encoded already. Do not use this mode when playing back DVDs, Blu-ray disks or if there is a bass manager before the subwoofer. The LFE channel should be replayed at a level 10 dB higher than the main channels. The level can be set in the monitoring matrix (console or external), or by setting an appropriate output level on the subwoofer.
- LFE (120 Hz)**
- Connect the LFE channel to the socket INPUT | LFE ⑬ of the KH 805.
 - Set the switch RIGHT CHANNEL INPUT MODE ⑳ to "LFE (120 Hz)".
 - Calibrate the frequency response of the subwoofer to be flat.
 - Measure the SPL of one of the main channels using pink noise and a sound level meter set to "C-weighted" and "Slow".
 - Measure the SPL of the LFE channel using pink noise and a sound level meter set to "C-weighted" and "Slow".
 - Adjust the level so it is 4 dB higher than the main channel. This corresponds to 10 dB more (unweighted) level.
- Right channel input mode:** The LFE (WIDE) routing mode is used when there is a bass manager before the KH 805 subwoofer. It should also be used when a DVD or Blu-ray player is connected directly to the subwoofer (i.e. after the program material has been encoded). This mode avoids double filtering of the bass managed signal but still allows the subwoofer's frequency response to be calibrated.
- LFE (Wide)**
- In the source, set the bass management system to "On".
This is typically achieved by setting the loudspeaker size to "Small".
 - In the source, switch the subwoofer output to "On".
 - In the source, choose a crossover frequency of 80 Hz.
 - In the source, select the crossover slope to be 24 dB/oct., if possible.
 - Connect the "Sub" channel to the socket INPUT | LFE ⑬ of the KH 805.
 - Set the switch RIGHT CHANNEL INPUT MODE ⑳ to "LFE (WIDE)".
 - Calibrate the frequency response of the subwoofer to be flat.
 - Set the level so it has the same level as the loudspeakers.
- Right channel input mode:** The Daisy Chain routing mode is used for the second, third, fourth, etc. subwoofers connected in a daisy chain configuration. The first subwoofer acts as a "master" for the subsequent subwoofers in the daisy chain.
- Daisy Chain**
- Connect the signal(s) to the first subwoofer in the daisy chain and set the switch RIGHT CHANNEL INPUT MODE ⑳ to "RIGHT", "LFE (120 Hz)" or "LFE (WIDE)" as appropriate - see above.
 - Connect the socket OUTPUT | DAISY CHAIN ⑭ of the first subwoofer to the socket INPUT | DAISY CHAIN ⑬ of the second subwoofer and set the switch RIGHT CHANNEL INPUT MODE ⑳ of the second subwoofer to "DAISY CHAIN".
 - Repeat the above for each additional subwoofer in the daisy chain.
 - Using the acoustical controls on the first subwoofer, calibrate the frequency response of the entire subwoofer set to be flat and set the level so it has the same level as the loudspeakers. The acoustical controls of the daisy chained subwoofers have no effect on the response of those subwoofers.



Activating ground lift

If there is humming or buzzing noise coming from the subwoofer, first search for the cause of the noise:

- Disconnect all input and output signal cables from the subwoofer.
If the noise goes away, it is probably coming from the audio source or source cabling. It might be possible to eliminate the noise by disconnecting the ground from the input signals (activating ground lift).

To activate ground lift:



- Reconnect the signal cables and set the switch INPUT GROUND LIFT ⑫ to “LIFTED”.
This internally disconnects pin 1 of the XLR input sockets from the subwoofer electronics’ chassis ground (see table on page 10).



For safety reasons, the electronics chassis ground is always connected to the mains power earth pin. Never disconnect the earth pin of the mains cable from ground.

Even when ground lift is activated, the pins 1 of all audio inputs remain electronically connected to each other.



Cleaning and maintaining the subwoofer

CAUTION

Damage to the product caused by liquids!

Liquids entering the product can cause a short-circuit in the electronics and damage or even destroy the product.

► Keep all liquids away from the product.

- Before cleaning, disconnect the product from the mains power supply (see page 14).
- Use a soft, dry, and lint-free cloth to clean the product.

Troubleshooting

Problem	Cause	Solution
There is hum or buzz coming from the KH 805 when an audio cable is connected.	A cable is defective, the cabling is bad, there is ground loop in the installation or the level of the audio source is too low.	Check all cabling to eliminate the cause of the problem, do not lay signal cables parallel to mains cables, use balanced cables, use the ground lift switch (see page 19) or send higher signal levels from your source and reduce the level on your subwoofer and your monitors.
There is a sudden reduction of the subwoofer's output level, the LED POWER ON ⑲ changes from green to red, the output level is reduced by 6 dB.	The temperature of the power amplifier is too high.	Ensure sufficient ventilation of the subwoofer and/or reduce the input signal level, or add extra subwoofers to increase LF headroom. When the temperature has dropped again, the LED POWER ON ⑲ lights up green and the output level reduction is canceled.
The LED POWER ON ⑲ lights up red in time with low-frequency input signals.	The signal level is too high, the protection system is active.	Reduce the signal level.


For further information, please refer to the "Questions & Answers" section at www.neumann.com.




Specifications

Acoustics	
–3 dB free field frequency response	18 Hz to 300 Hz, ± 3 dB
Pass band free field frequency response	19 Hz to 300 Hz, ± 2 dB
Self-generated noise (with input gain set to 100 dB for 0 dBu)	< 20 dB(A) at 10 cm
Total harmonic distortion < 0.5 % at 95 dB SPL at 1 m	>45 Hz
Max. SPL in half space with 3% THD at 1 m, averaged between 40 Hz and 90 Hz	110.7 dB SPL
Max. SPL with pink noise in half space at 1 m, linear	112 dB SPL
Electronics	
Amplifier, continuous (peak) output power	160 W (200 W)
THD and noise at continuous load	< 0.1 % (–60 dB) with deactivated limiter
Controller design	analog, active
Crossover frequency of main channels	80 Hz
Crossover slope	24 dB/oct., 4 th order
Acoustical control Low cut ⑨	center frequency: 30 Hz Q factor = 1.5 gain range: 0 to –12 dB
Acoustical control Parametric equalizer ⑩	bypassable gain: +4 to –12 dB frequency: 20 Hz to 120 Hz Q factor: 1 to 8
Time of flight adjustment delay	0° to –315°, adjustable in steps of 45°
Output level control (for a 0 dBu input signal at 1 m in free field conditions)	94 dB SPL, 100 dB SPL, 108 dB SPL, 114 dB SPL
Input sensitivity	–12 dB ... +2 dB
Protection circuitry	peak and thermal limiters
Infrasonic filter frequency; slope	6.5 Hz; 12 dB/oct.
Remote control ⑮ (6.3 mm jack socket)	via cable remote control
Analog inputs and outputs	
Input/output channels	2.0 or 0.1 / 2 + 1
Impedance, electronically balanced	XLR, 13 k Ω
Input sensitivity	–8 dBu/ +6 dBu (switchable)
CMRR of inputs	> 56 dB @ 20 Hz - 16 kHz
Max. input level	+24 dBu
Cross-talk between channels (1 kHz)	< –95 dB
Level matching	± 0.1 dB
Dynamic range, THD+N	119 dB(A), < 0.001% at –100 dB
LFE modes	120 Hz, wide
Displays	
Switch-on indicator	POWER ON LED ⑰ lights up green
Protection system active	POWER ON LED ⑰ lights up red
Bass management active	BASS MANAGEMENT LED ⑰ lights up green
Product properties	
Mains voltage	220 ... 240 or 100 ... 120 V AC switchable, 50/60 Hz



Power consumption (idle)	14 W
Power consumption (full output AC)	280 W
Dimensions (H x W x D)	360 x 330 x 645 mm
Internal net volume/external volume	41.5 l/76.6 l
Weight	26.5 kg (58.4 lbs)
Driver	magnetically shielded 1 x 265 mm (1 x 10")
Cabinet surface finish, color	painted wood (MDF), metallic anthracite (RAL 7021)
Driver protection	metal grille
Temperature	
Operation and storage, unpacked	+10 °C to +40 °C (+50 °F to +104 °F)
Transport and storage, packed in original packaging	–25 °C to +70 °C (–13 °F to +158 °F)
Relative humidity	
Operation and storage, unpacked	max. 75 % (non-condensing)
Transport and storage, packed in original packaging	max. 90 % (non-condensing)
In compliance with	
Europe 	EMC EN 55103-1/-2, Electromagnetic Environment: Class E2 Safety EN 60065
USA	47 CFR 15 subpart B
Canada	CAN ICES-3 (B)/NMB-3(B)

Acoustical measurements, block diagram and pin assignment

Additional technical data such as acoustical measurements, a block diagram of the KH 805 and the pin assignments of the XLR socket and the REMOTE CONTROL socket  can be found at the end of this operating manual.



Accessories

Product	Description
FO 810	Flight case for KH 805
REK 3	Remote electronics kit
SC 2	Subwoofer cable, 2 m
SC 5	Subwoofer cable, 5 m
SC 10	Subwoofer cable, 10 m
SC 15	Subwoofer cable, 15 m
SC 20	Subwoofer cable, 20 m
SC 25	Subwoofer cable, 25 m
SC 30	Subwoofer cable, 30 m

Detailed mechanical drawings of all Neumann products are available at www.neumann.com.



Manufacturer Declarations

Guarantee

For the current terms and conditions of the product guarantee, please visit www.neumann.com.



In compliance with the following requirements

- WEEE (2002/96/EC)

Please dispose of the product at the end of its operational lifetime by taking it to your local collection point or recycling center for such equipment.



CE Declaration of Conformity

- RoHS (2011/65/EU)
- Low Voltage Directive (2006/95/EC)
- EMC Directive (2004/108/EC)

The declaration is available on the product page at www.neumann.com.

Certified by



Audio, Video and Similar Electronic Apparatus - Safety Requirements CAN/CSA C22.2 No. 60065-03 Incl. AM1 and UL Std. No. 60065-2007

Trademarks

Neumann® is a registered trademark of Georg Neumann GmbH. The following are trademarks of Georg Neumann GmbH:

- Plane Wave Bass Array™ and PWBA™

Other company, product, or service names mentioned in this operating manual may be the trademarks, service marks, or registered trademarks of their respective owners.

FCC

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.

This class B digital apparatus complies with the Canadian ICES-003.

Changes or modifications made to this equipment not expressly approved by Neumann may void the FCC authorization to operate this equipment.



Technical information & glossary

Absolute level

In Europe, the absolute level of 0 dBu is –18 dBFS (EBU standard R68). In the US, +4 dBu is –20 dBFS (SMPTE standard RP155). These dBu values should lead to the following sound pressure levels:

Application	Sound pressure level
Film	85 dB(C)
Broadcast	79 dB(C) (reference level)
Music	No defined reference levels

Near field loudspeakers can be as close as 1 m from the listening position, whereas loudspeakers in a Dolby certified movie mixing room should be at least 5 m from the listening position.

In the examples below, it is assumed that the listener is inside the room radius and thus the sound field decays according to $20 \log_{10}(r)$, however this may not always be the case.

Absolute voltage level of input signal	0 dBu (0.775 V)	+4 dBu (1.23 V)
Setting SUBWOOFER GAIN INPUT GAIN ②	–1 dB	–5 dB
Setting SUBWOOFER GAIN OUTPUT LEVEL ⑧	100	100
Listening distance [m] (dB change)	5 m (–14 dB)	5 m (–14 dB)
Measured output level in dB SPL at 1 m	85 dB SPL	85 dB SPL
Maximum input signal before activation of the protection system	17 dBu	17 dBu

Absolute acoustic level calibration for signal channels is generally achieved using a sound level meter set to “C-weighted” and “Slow”. Play a broadband pink noise test signal set to –18 dBFS (Europe) or –20 dBFS (USA) on the console meters and measure the sound pressure level at the listening position. Then adjust each channel’s source level, not the loudspeakers and subwoofer(s) so that the above stated sound pressure levels are achieved.

Acoustical axis

The acoustical axis is a line perpendicular to the subwoofer’s front panel along which the microphone was placed when tuning the subwoofer’s crossover during design. The acoustical axis is located at the midpoint of the KH 805’s bass driver. Note that the subwoofer emits very low frequencies which are emitted omnidirectionally. That is why the orientation of the subwoofer cabinet in the room does not matter.

Acoustical controls

The acoustical controls are low-order analog filters designed to compensate for some of the acoustical issues commonly found in listening environments. The acoustical controls’ settings will depend on the subwoofer’s location and will probably be different for the same subwoofer type positioned in different locations in the same room. When calibrating subwoofers there are three areas requiring attention: in-room response, level relative to main loudspeakers, and phase relative to main loudspeakers.



Acoustical output level

Depending on the setting of the potentiometer SUBWOOFER GAIN | INPUT GAIN ② and the switch SUBWOOFER GAIN | OUTPUT LEVEL ③ — and referred to an input signal level of 0 dBu — the following acoustical output levels can be obtained:

Setting of potentiometer SUBWOOFER GAIN INPUT GAIN ②	Acoustic output level [dB SPL] of the subwoofer at 1 m when input signal level is 0 dBu			
	Setting of switch SUBWOOFER GAIN OUTPUT LEVEL ③			
	94 dB	100 dB	108 dB	114 dB
–12 dB	82 dB SPL	88 dB SPL	96 dB SPL	102 dB SPL
–10 dB	84 dB SPL	90 dB SPL	98 dB SPL	104 dB SPL
–8 dB	86 dB SPL	92 dB SPL	100 dB SPL	106 dB SPL
–6 dB	88 dB SPL	94 dB SPL	102 dB SPL	108 dB SPL
–4 dB	90 dB SPL	96 dB SPL	104 dB SPL	110 dB SPL
–2 dB	92 dB SPL	98 dB SPL	106 dB SPL	112 dB SPL
0 dB	94 dB SPL	100 dB SPL	108 dB SPL	114 dB SPL
+2 dB	96 dB SPL	102 dB SPL	110 dB SPL	116 dB SPL

The default setting is SUBWOOFER GAIN | INPUT GAIN ② = “0 dB” and SUBWOOFER GAIN | OUTPUT LEVEL ③ = “100 dB SPL at 1 m”, which corresponds to a sound pressure level of 100 dB SPL measured at a distance of 1 m, when the input signal has a level of 0 dBu.

Using the potentiometer SUBWOOFER GAIN | INPUT GAIN ② and the switch SUBWOOFER GAIN | OUTPUT LEVEL ③, you can compensate for level differences due to acoustical loading (see page 9) and due to different distances of the subwoofers and loudspeakers from the listening position.

Examples of how to calculate sound pressure levels as a function of the input signal levels and input and output levels of the KH 805:

Absolute voltage level of input signal	0 dBu (0.775 V)	+4 dBu (1.23 V)	+6 dBu (1.55 V)	+16 dBu (4.89 V)
Setting SUBWOOFER GAIN INPUT GAIN ②	0	0	0	0
Setting SUBWOOFER GAIN OUTPUT LEVEL ③	100	100	100	100
Measured output level in dB SPL at 1 m	100	104	106	116

Acoustical response

Neumann subwoofers are designed to have a flat pass band magnitude response in anechoic conditions when all the acoustical controls are set to 0 dB. When a subwoofer is installed into a listening environment the response changes and thus should be corrected back to a flat response. It is therefore expected that the acoustical controls will need adjustment to improve the in-situ response of the subwoofer. The acoustical controls' settings depend on the subwoofer's location and will probably be different for the same subwoofer type installed in different locations in the same room. Moving the cabinet small distances, 50 cm (20"), can dramatically change the response therefore resulting in different acoustical control settings.

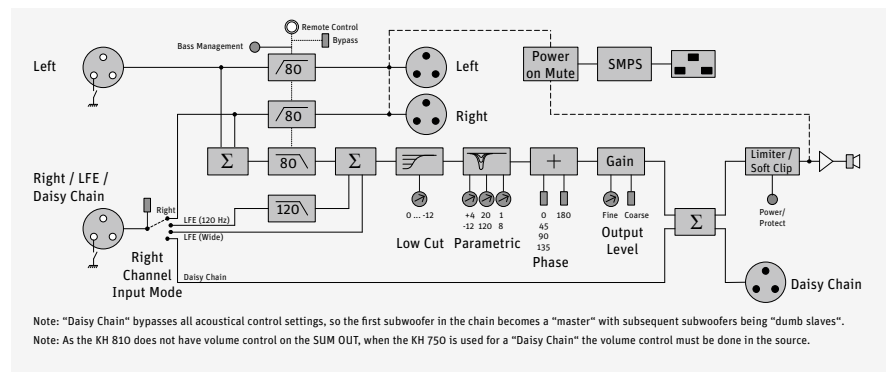
Graphs of acoustical measurements conducted in anechoic conditions at a distance 1 m can be found at the end of this operating manual. Color versions of these graphs can be found on the corresponding product pages at www.neumann.com.



Signal routing	<p>The KH 805 has two input channels (LEFT, RIGHT/LFE/DAISY CHAIN) and three output channels (LEFT, RIGHT, DAISY CHAIN). After the electronically balanced input stages, there are two 4th order 80 Hz high pass filters for the main channels followed by two electronically balanced output stages. The signal connected to the left input is always routed to the subwoofer via a 4th order 80 Hz low pass filter and to the left output via an 80 Hz 4th order high pass filter. This is the same for the right input when the input mode is set to RIGHT.</p> <p>All outputs (main channels and daisy chain) have protection circuits to avoid power on/off noises: the outputs switch on after a short delay when mains power is applied and mute instantaneously when mains power is removed.</p> <p>If you select the corresponding mode, there is also 120 Hz low pass filtering for an LFE channel or a wide input if you have an external bass manager (more details can be found on page 19). Additionally a daisy chain mode allows you to connect additional subwoofers.</p>
Crossover	<p>Using 4th order filters, the crossover divides the input signal of each channel into two bands for reproduction by the subwoofer or the main loudspeakers. The crossover frequency is fixed at 80 Hz for all the main channels and can be bypassed when required. This frequency was chosen to balance the conflicting requirements of having a high crossover frequency to relieve the main loudspeakers of their low frequency duties thereby reducing distortion, and of the need to have a low crossover frequency to minimize the chances of localizing the subwoofer thereby giving greater flexibility when placing the subwoofer in the room. In addition, by choosing 80 Hz, there is a compatibility with the replay conditions commonly found in consumer products.</p>
Driver	<p>Long throw, efficient, low distortion driver ensures a clean sound quality even at high replay levels. The driver is loaded by the internal volume of the cabinet and is magnetically shielded for use next to CRT screens and magnetic storage media.</p>
LFE channel	<p>“Low Frequency Effects” (Dolby) or “Low Frequency Enhancement” (dts). The LFE channel has a limited bandwidth. Because of the limited frequency range of the LFE channel, it is referred to as “.1” when describing, for example, a 5.1 system. The designation “LFE channel” always refers to the source and not to the loudspeakers.</p>
Power amplifier	<p>The high efficiency power amplifier of the KH 805 minimizes power dissipation and is run in bridged mode to minimize distortion.</p>
Protection system	<p>An extensive protection system prevents damage to the subwoofer if high signal levels are applied to the input. The LED POWER ON ⑩ changes from green to red when the protection system is active. In this case, reduce the input signal level. If this happens regularly, use a larger subwoofer with a higher SPL output or add more subwoofers to the system to increase the LF headroom.</p> <p>The protection system consists of thermal and peak limiters for the amplifier and thermal modeling of the driver. The protection system is not a compressor, it is designed to protect the subwoofer from damage. The protection system cannot protect against sustained abuse of the loudspeaker system, i.e. playing the subwoofer for long periods of time with the LED POWER ON ⑩ lighted up red. Please avoid consistent abuse of the subwoofer to not affect the long service life of the product.</p>

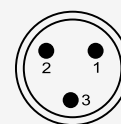


System block diagram/System-Blockdiagramm/ Synoptique système/Diagrama de bloques del sistema



Pin assignment of the XLR socket/Buchsenbelegung XLR/ Brochage de la prise XLR/Asignación de la hembra XLR

1	Audio ground/Audio-Erdung/Masse audio/Toma de tierra de audio
2	Signal +/Signal +/Signal +/Señal +
3	Signal -/Signal -/Signal -/Señal -



Pin assignment of the REMOTE CONTROL socket/ Anschlussbelegung der Buchse REMOTE CONTROL/ Brochage de la prise REMOTE CONTROL/Asignación de conexiones de la hembra REMOTE CONTROL



Jack plug/Klinkenstecker/ fiche jack/conector jack	Function/Funktion/Fonction/Función
Tip	Bass Management *
Sleeve	Ground/Erdung/Masse/Toma de tierra

* Short the tip and sleeve together to bypass the bass management

NOTE: There is a 9 V DC supply on the tip connection of this socket so that an LED can be lit up to show when the bass management is on. Many guitar amplifier foot switches have this function.

HINWEIS: An der Buchsenspitze liegt eine Spannung von 9 V DC an, damit eine LED den Status des Bass Managements anzeigen kann. Viele Fußschalter für Gitarrenverstärker verfügen über diese Funktion.

NOTE : Une tension de 9 V CC est présente à la pointe de la prise pour qu'une LED puisse afficher le statut du bass management. Beaucoup de pédales pour ampli de guitare disposent de cette fonction.

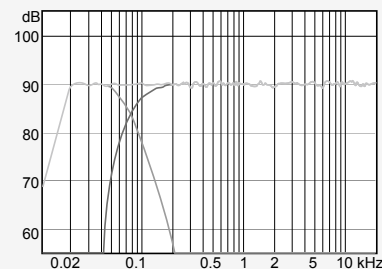
NOTA: A la punta de la hembra llega una tensión de 9 V DC para que un LED pueda indicar el estado de la función Bass Management. Muchos interruptores de pedal para amplificadores de guitarra incorporan esta función.



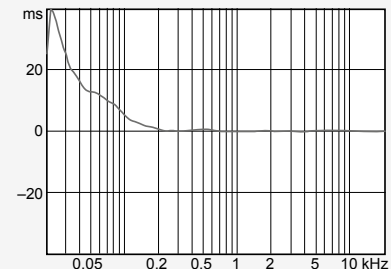
Acoustical measurements/Akustische Messungen/ Mesures acoustiques/Mediciones acústicas

EN	Below are acoustical measurements conducted in anechoic conditions at 1 m. Color versions of these graphs can be found on the appropriate product page of the web site.
DE	Die folgenden akustischen Messungen wurden unter reflexionsarmen Bedingungen bei 1 m Abstand durchgeführt. Farbversionen dieser Diagramme finden Sie auf den entsprechenden Produktseiten der Neumann Website.
FR	Vous trouverez ci après les courbes correspondant aux mesures acoustiques effectuées en chambre sourde, à une distance de 1 mètre du moniteur. Vous retrouverez ces courbes, en couleur, dans la section appropriée de notre site Web.
ES	Las siguientes mediciones acústicas se han realizado bajo condiciones de baja reflexión a una distancia de 1 m. Encontrará versiones a color de estos diagramas en las páginas correspondientes de los productos en la página web de Neumann.

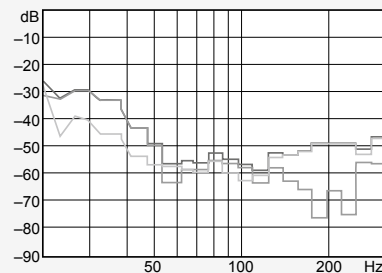
KH 805 + KH 120
Free-field response
Freifeld-Frequenzgang
Réponse en champ libre
Respuesta en frecuencia en campo libre



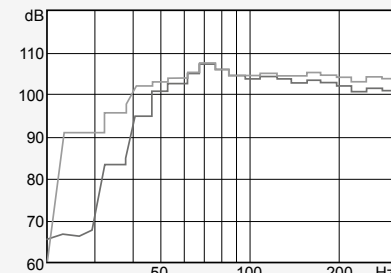
KH 805 + KH 120
Group delay
Gruppenlaufzeit
Temps de propagation de groupe
Retardo de grupo



KH 805
Harmonic distortion at 95 dB SPL
Klirrfaktor bei 95 dB SPL
Distorsion harmonique à 95 dB SPL
Distorsión armónica total a 95 dB SPL



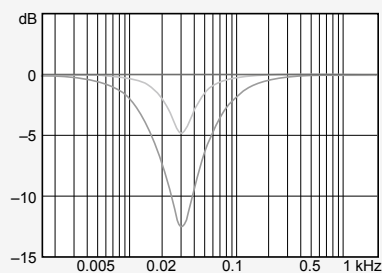
KH 805
Maximum SPL at 1 m (1% and 3%)
Maximaler SPL bei 1 m (1 % und 3 %)
Niveau SPL maximal, à 1 m (1% et 3%)
SPL máximo a 1 m (1 % y 3 %)



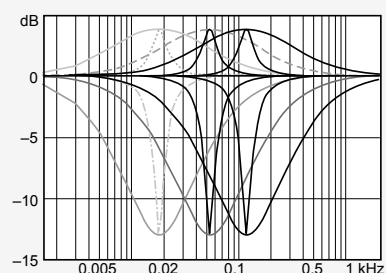


Acoustical controls/Akustikregler/Acoustical Controls/Acoustical Controls

Low Cut acoustical control
Akustikregler: Low Cut
Action du potentiomètre Low Cut
Control de corte de bajos (Low Cut)



Parametric Equalizer
Parametrischer Equalizer
Action de l'égaliseur paramétrique
Control del ecualizador paramétrico



LFE channel electrical response
Elektrischer Frequenzgang LFE-Kanal
Courbe de réponse électrique du canal LFE
Respuesta eléctrica del canal LFE

