



# 0800

Active  
Studio Subwoofer

Installation and Operation



# Active Studio-Subwoofer KLEIN + HUMMEL O 800

Installation - Operation



Figure 1: Front O 800

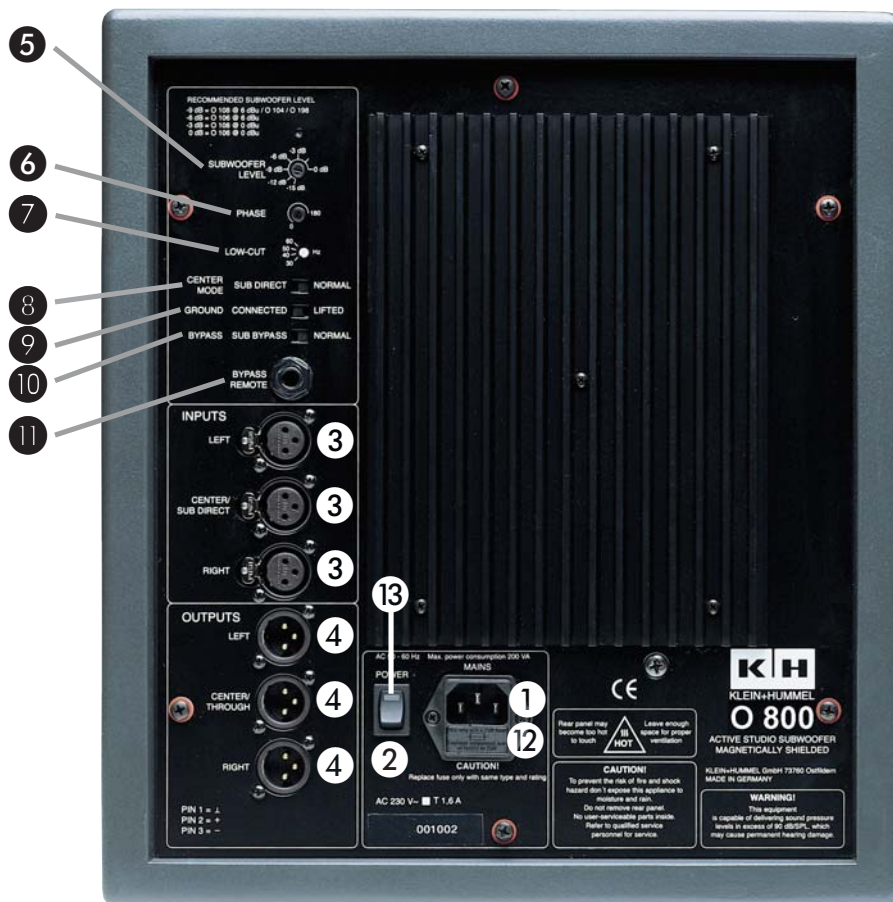


Figure 2: Input section O 800 (rear)

## 1. Connections and Operation

It is absolutely essential that you read and observe the Safety Instructions in Section 4 before connecting or using this device.

### 1.1 Operating Conditions

The K+H model O 800 active studio subwoofer model is intended for use over a range of ambient temperatures from +10° C to +40° C (+50° F to +104° F). During transport or storage, temperatures from -25° C to +70° C (-13° F to 158° F) are permissible.

### 1.2 Installation

The loudspeaker chassis used in the O 800 is magnetically shielded, making it possible to set this unit directly next to a computer without fear of altering the data on its hard drive. Similarly, this unit can be positioned under or next to video or computer monitors without adversely affecting the screen. The subwoofer is intended to be used in an upright position, resting solidly on the floor. If you place the unit near a wall, please leave at least 8 inches (20 cm) of space before the wall to ensure proper cooling of the integral amplifier.

### 1.3 Connection to Mains Current (AC Power)

**1**  
The amplifier electronics are set up for an AC line voltage of 230 volts, 50 or 60 Hz. For export, special versions with other AC voltages are also available. If the mains power cable should ever become damaged, it may not be repaired, but must be replaced.



### 1.4 POWER Switch **2**

When you switch on power to the unit, there is a three-second delay before the amplified signal is sent to the subwoofer, as well as to the outputs for the satellite loudspeakers. This delay avoids the loud popping sounds that otherwise may be generated by devices earlier in the signal chain as power reaches them. You will find this arrangement particularly useful if your studio uses a master switch to power up all the equipment at once. When power on the O 100 is turned off, on the other hand, or if there is a general power failure, the signal flow to the speaker is immediately cut off, preventing any loud pops. A green LED in the power switch itself indicates that the unit is switched on and ready to go.

### 1.5 Inputs **3**

The sensitivity of the three electronically balanced inputs is -6 dBu (0.388 volt) referenced to maximum output of the subwoofer. The setting has no influence on the audio outputs. The 3-pin XLR jacks (female) are wired in the standard manner (pin 1 = ground, pin 2 = +, pin 3 = -). The inputs are modular and can optionally be

ordered as transformer-balanced, floating inputs.

### 1.6 Outputs **4**

The outputs are electronically balanced and are intended to be connected to active monitor inputs. In normal operating mode, the signal at each channel of these outputs is identical to that which came into the corresponding input channel, with the exception that the output signal only contains information above 90 Hz (also see the sections *Center Mode* and *Bypass*). The 3-pin XLR jacks, male in this case, are wired in the standard manner (pin 1 = ground, pin 2 = +, pin 3 = -).

### 1.7 Subwoofer Level **5**

This control pot allows you to adapt the output volume of the subwoofer to any monitor loudspeakers, and can be varied within an 18 dB range.

**In setting up your subwoofer for best results, we urgently recommend that you use the supplied reference CD (see Section 5), as room acoustics and subwoofer placement vary widely and therefore demand widely varying settings.**

### 1.8 Subwoofer Phase **6**

**Use this control to adjust for varying distances between the subwoofer and the monitors. If the loudspeakers are set up the same distance away from each other horizontally, a setting of 0° is recommended. If the distances are different, you will need to use the reference CD in order to ensure proper settings.**

### 1.9 Low-Cut Filter **7**

This four-position switch can be used to set the low-frequency cut-off point of the subwoofer at 30, 40, 50, or 60 Hz, for example to simulate the sonic character of "smaller" loudspeakers. It also reduces the subwoofer level in steps of approximately 1 dB.

### 1.10 Center Mode **8**

Use this control to switch the center input and output from Normal mode to broad-band operation ("sub direct") if you are using the LFE output of a surround-sound amplifier. In this mode, the Center input signal is sent unfiltered to both the subwoofer and the Center output.

#### **NORMAL**

In this mode, the signals of all three inputs are electronically summed and sent through a 90 Hz low-pass filter to the subwoofer. The signal at the other outputs then has content only above 90 Hz. This is the recommended setting in those cases where the three front signals (Left, Cen-

ter, Right) are going to a surround-sound system.

### ***SUB DIRECT***

In Sub-Direct mode, only the left and right input signals are electronically summed and sent through a 90-Hz low-pass filter to the subwoofer, whereas the signal from the CENTER/SUB-DIRECT input is sent to the subwoofer directly as a broadband signal, i.e. without filtering out any of the frequency spectrum. This mode would then allow a second subwoofer to be added for the purpose of increasing the overall system output. This operating mode is recommended when both rear channels are reproduced by way of Left and Right and the Effect channel is reproduced by way of the Center/Sub Direct.

#### **1.11 Ground Lift 9**

Since the inputs are balanced, it should rarely happen that you encounter problems with hum. In unusual cases or if the source is unbalanced, it may become necessary to lift the signal ground from the chassis ground. To do so, simply move the GROUND switch to the LIFTED position. In the CONNECTED position the chassis ground and the signal ground are connected to each other by way of a fuse-resistor. However, the chassis ground always remains connected to the protective earth conductor of the mains cable.

#### **1.12 Bypass 10**

Use this switch if you wish to mute the subwoofer for purposes of evaluating the sound of the system without any low-frequency reinforcement. In the position *SUB BYPASS*, all outputs are fed broadband signals from their corresponding inputs (without the 90-Hz high-pass filtering), whereas in the position *NORMAL*, the subwoofer operates in the manner we already described.

#### **1.13 Bypass Remote 11**

With a standard on/off single-pole footswitch connected to this jack, you can operate the bypass function remotely.

Please note that this jack takes precedence over the *BYPASS* switch, i.e., when this jack is occupied by a ¼" phone plug, the *BYPASS* switch is disabled.

Footswitch open = NORMAL

Footswitch closed = BYPASS

#### **1.14 Mains Fuse 12**

When replacing the fuse, **first disconnect the mains cable** and ensure that the new fuse is of the following type:

for 230 volts AC: 1.6 A Slo-Blo (5 x 20 mm)  
for 117 volts AC: 3,15 A Slo-Blo (5 x 20 mm)  
for 100 volts AC: 3,15 A Slo-Blo (5 x 20 mm)

#### **1.15 Power Indicator LED 13**

The green LED built into the power switch will illuminate to confirm that the subwoofer is operational.

#### **1.16 Care of the Cabinet**

The cabinet housing of the K+H O 800 active studio subwoofer comes standard with an anthracite-colored enamel finish (RAL color 7021). Take care when handling the unit not to damage the finish. To clean the cabinet, use a soft cloth with a mild cleaning agent only. Under no circumstances should you use alcohol-based or chemical agents, nor any cleaners with abrasive action.

### **2. Warranty Information**

All K+H products undergo an extensive procedure of quality control testing before leaving the factory. Before semiconductors are mounted on the circuit board, they are subject to rigorous tests. Every single unit is guaranteed to match its technical specifications within strict predetermined tolerances.

Please store the original carton in a safe, dry place. If you should ever need warranty service, put the unit in its original packing material and carton together with a detailed description of the problem, and ship it (freight prepaid) to our distributor or directly to:

**the dealer where the unit was purchased.**

K+H warrants, that the product is free from any defects in both material and manufacturing and that it meets the specifications. A warranty case can only be acknowledged under condition that the complaint is filed to our distributor or to us in writing **within 8 days** after delivery or detection of the fault. Not covered under this warranty are damages due to inexpert packing and shipment, wear and tear, improper handling, installation, operation and maintenance.

The limitation period for warranty claims is described in the terms and conditions of K+H GmbH. It's our choice to repair, to supply a new product or to withdraw from the contract.

In the event warranty service is required, presentation of a warranty card will not be necessary. Proof of purchase date can be made by filing copies of appropriate documents (invoice, delivery note).

### **3. Diagrams**

The outstanding sonic impression made by the O 800 active studio subwoofer in listening tests is confirmed by the most advanced technical test

measurements available. The following diagrams reflect but a small portion of these measurements.

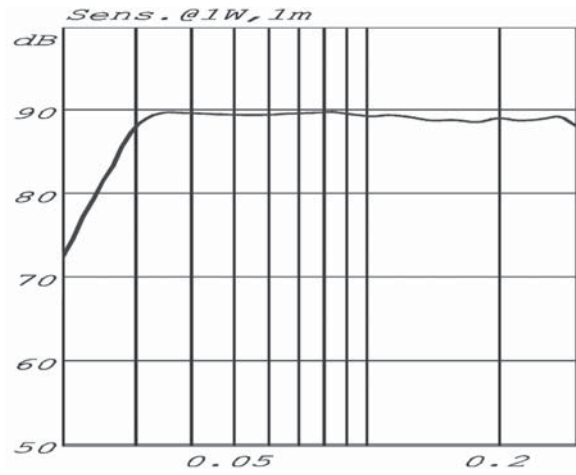


Figure 3:  
Free-field frequency response measurement in Sub Direct Mode

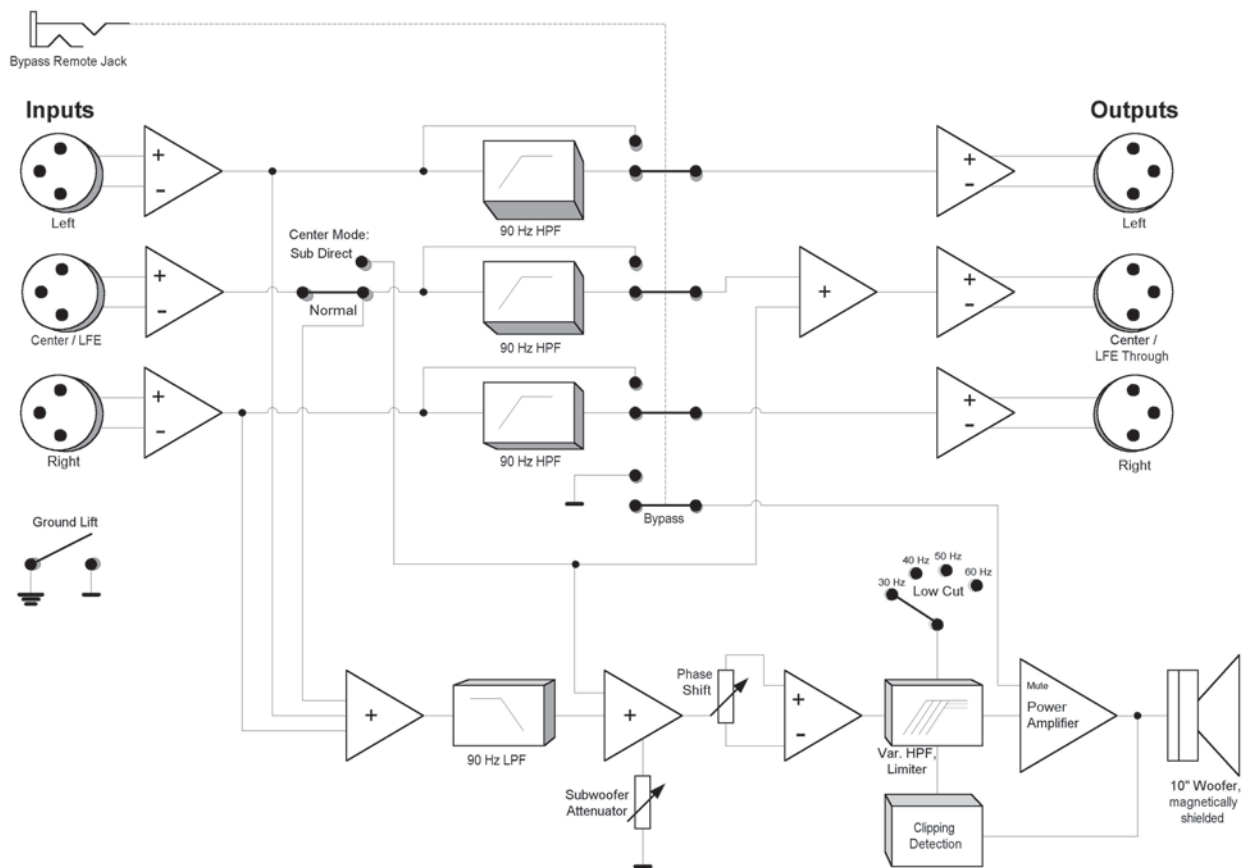


Figure 4:  
Block diagram of the amplifier electronics

#### 4. KLEIN + HUMMEL Surround-Sound Recommendations

KLEIN + HUMMEL believes, that it is very important to maintain the same sonic character across several loudspeaker lines. This foundation of uniformity ensures, that the various monitors can be used in combination with each other. Nevertheless, since the size and shape of each cabinet has a significant influence on a loudspeaker's dispersion pattern, the monitors can, as a result, sound quite differently depending on where they are placed in the room.

To achieve optimal results, we therefore recommend, that when you design your surround-sound layout, you keep the following overview in mind.

##### 4.1 Matrix Surround (Dolby® Surround)

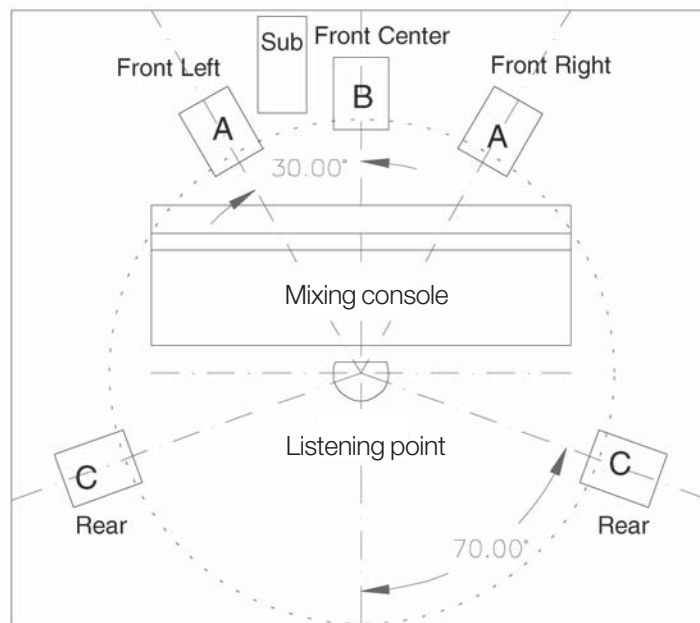


Figure 5: Listening room setup in matrix surround

##### Position and loudspeaker type

Front L + R	Front Center	Rear L + R	Subwoofer
Monitor A	Monitor B	Monitor C	
○ 110	○ 110	M 50	○ 800
○ 110	○ 110	P 110	○ 800
○ 110	○ 110	○ 110	○ 800
○ 200	○ 200	○ 110	○ 800
○ 300 D	○ 300 D	○ 110	○ 800
○ 400	○ 400	○ 110	1 or 2 x ○ 800
○ 400	○ 400	○ 200	1 or 2 x ○ 800

## 4.2 Discrete Surround (AC-3, DTS)

With discrete 5.1 channel surround systems (5 separate main channels + 1 Low Frequency Effects channel) all main channel monitors are to be of the same type, i.e., Monitor A = Monitor B = Monitor C.

If space is tight in smaller rooms, the next smaller monitor type can be substituted for the rear loudspeakers.

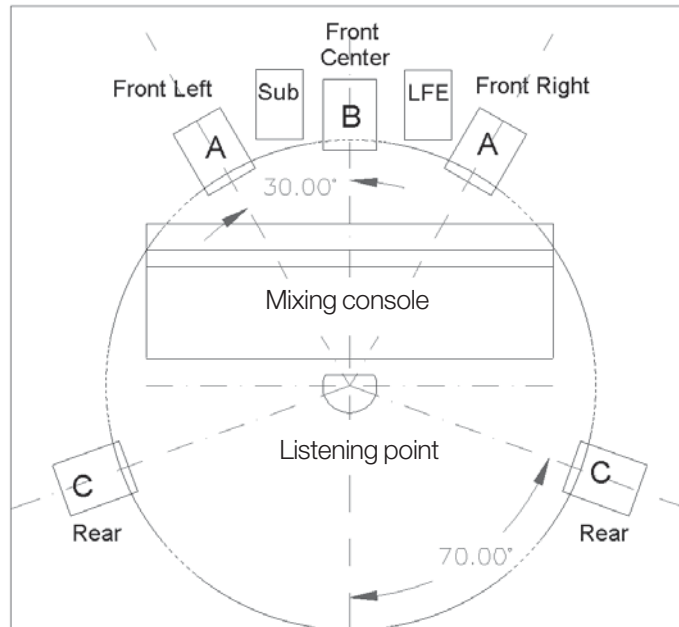


Figure 6: Listening room setup in discrete surround

### Position and loudspeaker type

Front L + C + R Rear L + R	Low Frequency Effects (LFE)	Subwoofer
○ 110	○ 800 For LFE	○ 800 Optional sub-extension for front channels
	Optional as sub-extension for rear channels	
○ 200	○ 800 For LFE	○ 800 Optional sub-extension for front channels
	Optional as sub-extension for rear channels	
○ 300 D	○ 800 For LFE	○ 800 Optional sub-extension for front channels
	Optional as sub-extension for rear channels	
○ 400	○ 800 For LFE	1 or 2 x ○ 800 Optional sub-extension for front channels
	Optional as sub-extension for rear channels	

## 5. Safety Instructions

**It is absolutely essential that you read these safety instructions carefully before connecting and using this K+H product. Your safety depends on it. Furthermore, failure to follow these instructions voids the warranty.** To ensure safe operation for years to come, keep these instructions in a safe place for future reference. K+H has manufactured this product in accordance with IEC 60065 standards, then tested and delivered it in safe operating condition. To maintain it in this condition, you must:

- observe all safety instructions,
- use the product only as described herein,
- have any maintenance, repairs, or modifications performed only by K+H or other authorized personnel, and
- ensure that the room in which you use this product is wired in accordance with the local electrical code.

### Warning!

- When the interior of the cabinet is exposed, touching some parts can lead to an electric shock.
- If you need to gain access to the interior electronics of the unit, always disconnect the unit from any and all power sources first.
- Any repairs, maintenance, or other service of the unit when its interior compartment is exposed may only be performed safely (in accordance with VBG 4) by authorized technicians familiar with all the risks involved. Even in an unplugged state, a fully charged capacitor in the unit can zap the unsuspecting.
- Loudspeaker output jacks labeled with the IEC 417/5036 emblem (Fig. A, right) may be carrying dangerously high voltages. If your unit has this emblem, ensure that any connections to be made between these jacks and the speakers themselves are made before powering up the unit, and are done so only with manufacturer-approved interconnecting cables.
- If you need to replace any fuses, ensure that the replacements are of exactly the same type, value and voltage as the originals, as spelled out in the technical specifications at the rear of this manual.
- Do not use "repaired" fuses.
- If you do not have any fuses on hand of the specified size, type, and value, do not hot-wire the contacts in the holder by short-circuiting them.
- Certain areas of the cabinet, cover, and rear panel can achieve extreme temperatures and are therefore marked with a "HOT" label (Fig. B). Refrain from touching any heat sink or ventilation grille.
- High volume levels are known to cause permanent - i.e. irreversible - hearing damage, especially when listened to without sufficient breaks. The higher the levels, the more frequent and extended must be the breaks. Avoid standing too close to loudspeakers that are being driven at high levels. If you must be exposed to high sound pressure levels over an extended period of time, use hearing protection.



Fig. A



Fig. B

### Mains Connection:

- This unit is designed for continuous operation.
- Ensure that the operating voltage of the unit matches that of the local mains current (AC line voltage).
- Always check before connecting the power cable to the mains socket that the power switch on the unit itself is set to off ("O").
- Use the power cable or power supply that came with the unit to connect to the mains socket (wall outlet).
- Power supply: a damaged power cable may not be repaired. Use a new cable.
- Avoid plugging the mains cable into a power strip that already has several other power-consuming devices connected to it.
- Avoid using extension cables. The unit must be connected to a mains socket close to it, and that socket should be freely accessible.

### Installation:

- This product may only be placed on a stable, clean, horizontal surface.
- Do not expose this product to vibration.
- Do not operate this product anywhere near water or other liquids. Do not use it near a sink, swimming pool, bathtub, or in any damp room or area. Electrical shocks carried through water can kill. Do not place any beverages whatsoever on or near this product, as liquids can kill electronic components.
- Ensure sufficient ventilation around the product to allow for adequate heat dissipation, especially near the rear panel and the sides of the cabinet (minimum of 8 inches from the nearest wall). The unit may only be installed in a rack if measures are taken to ensure sufficient ventilation and if the mounting instructions of the manufacturer are followed. Do not block or cover any heat sink, fan, or vent.
- Do not place the product where it will be in the path of direct sunlight, and keep it a safe distance away from radiators and other heaters of any kind.
- If you bring this product from a cold environment into a warm one (such as from a vehicle into a studio), it is quite possible that condensation will form inside the cabinet. Please allow the unit sufficient time for acclimatisation to room temperature (minimum thirty minutes) before connecting and powering up.
- To avoid accidents, do not use any accessory equipment with this product which is not approved by the manufacturer, particularly mounting accessories. Do not place this unit on any unstable platform, cart, stand or table. Should the unit fall, it can cause bodily injury to persons, or can be damaged itself.
- To protect this product from lightning damage during a thunderstorm or from power surges during an extended absence, disconnect the power cable from the wall outlet.



## 6. Reference CD

Taking the variables of subwoofer placement and room acoustics into account, KLEIN + HUMMEL has developed a reference CD with test signals to aid in adjusting the acoustical output of the subwoofer for optimal results.

To use the CD, first connect the subwoofer and satellite monitors as described above and check that they are roughly working correctly. Then ensure that the subwoofer is located at the spot where you will want it to be permanently situated, allowing enough room behind it for access to the switches and controls on the back panel. Adjustments should be performed from the perspective of the intended listening position. For further adjustments, you will need an assistant with a small screwdriver. We recommend that you connect a remote footswitch to activate the bypass function.

### Start out with these basic subwoofer settings:

Subwoofer level:	as recommended below for each track
Phase:	0°
Low-Cut:	30 Hz
Center Mode:	Normal
Bypass:	Normal

#### 6.1 Track 2 • Setting the Level

*Filtered noise with a low frequency cutoff at 60 Hz as well as a steep notch at 90 Hz.*

While switching back and forth between Sub-Bypass and Normal mode, adjust the level of the Subwoofer so that a difference in level between the two is no longer audible.

#### 6.2 Track 1 • Adjusting the Phase

*Filtered narrow-band noise with a center frequency of 90 Hz.*

In Normal mode, adjust the phase of the subwoofer for maximum addition between subwoofer and satellites, i.e. for maximum volume.

#### 6.3 Track 3 • Double-Checking the Settings

*Filtered noise with a low frequency cutoff at 60 Hz.*

Switch back and forth between Sub-Bypass and Normal modes to verify the settings you made previously. The level of bass should remain the same with or without the subwoofer.

#### 6.4 Track 4 • Double-Checking the Settings (especially the subwoofer)

*Filtered noise with a low frequency cutoff at 20 Hz.*

In this test, the reinforcement effect of the subwoofer in the lower frequencies should be quite obvious.

## Technical specifications

## O 800

<b>Maximum sound pressure level</b> in half space, 3% THD at 1 m distance averaged between		111.8 dB/SPL 40 Hz and 90 Hz
<b>Free-field frequency response</b>		30 Hz - 90 Hz ( $\pm 2$ dB) in Sub-Direct mode
<b>Self generated noise level at 10 cm</b>		$\leq 20$ dB(A)
<b>THD</b>	@ 95 dB/SPL/1 m	< 0.5 % above 30 Hz
<b>Amplifier</b>		
Power amplifier section		120 watts into 16 Ohms (THD $\leq 0.1$ %)
Crossover	Crossover point Slope	90 Hz 24 dB/octave
Limiter		prevents overloading of loudspeaker and amplifier
Inputs	Impedance Subwoofer sensitivity CMRR Subwoofer Level Control	Left – Center (or LFE signal) – Right > 20 kOhm (electronically balanced) - 6 dBu (0.388 V) $\geq 50$ dB 0 ... -18 dB
Outputs	Impedance Frequency range Level	Left – Center (or LFE pass-through) – Right 100 Ohms (electronically balanced) 90 Hz - 30 kHz or linear (in Bypass position) same as input signal
Low-cut filter	4-position switch	30 – 40 – 50 – 60 Hz with 18 dB/octave
Phase	infinitely variable	0 - 180°
Ground lift switch		separating signal ground from chassis ground
Center-Mode – Sub Direct		for Dolby 5.1 LFE Normal – Bypass
<b>Woofers</b>		265 mm (10") $\varnothing$ , 16 Ohm, cast iron chassis
<b>Magnetic shielding</b>		standard
<b>Connections</b>	Mains power Amplifier Inputs Amplifier Outputs Bypass Remote Control	3-terminal Euro-norm NK10 3 x XLR 3-31 (3-pin female jack) 3 x XLR 3-32 (3-pin male jack) ¼" phone jack
<b>Power consumption</b>	At idle Full output	15 VA 200 VA
<b>Mains</b>		230 or 117 or 100 volts 50/60 Hz depends on version
<b>Dimensions</b>	(W x H x D)	12-5/8" x 14" x 20-7/8" (320 x 354 x 530 mm)
<b>Net volume</b>		32.3 litres
<b>Weight</b>		55 pounds (25 kg)
<b>Cabinet</b>	MDF; with metal grille	dark grey enamel finish, color: RAL 7021
<b>Recommended K+H monitors</b>		O 100, O 104, O 108/TV, O 98, O 198, O 106 O 110, O 200, O 300 D, O 400

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