

GENELEC®

Genelec HTS3 and HTS4
Home Theater Subwoofers

Installation and
Operating Manual



General description

Genelec HTS3 and HTS4 are powerful low frequency loudspeakers designed specially for high quality digital 5.1 channel Home Theater systems. Both models share the same design layout with one active, magnetically shielded speaker driver on the long side of a compact rectangular cabinet and two passive radiators, one at each end of the cabinet. HTS3 and HTS4 are equipped with amplifiers rated at 200 and 400 Watts respectively. The amplifier unit is integrated in the subwoofer cabinet.

XLR and RCA line level input connectors and adjustable input sensitivity provide easy connection to all types of decoders. Bass roll-off rate and crossover phase can be adjusted to suit different acoustical environments and subwoofer positioning. A "LINK OUT" connector allows coupling two or more subwoofers together when high sound pressure levels are required. The amplifiers are equipped with an "AUTOSTART" function for automatic switching between "STANDBY" and "ON" modes. Connectors for remote power "ON/STANDBY" switches are also provided.

Installation

Each subwoofer is supplied with a mains cable and an operating manual. Once unpacked, place the subwoofer in a suitable location (for more details see the 'Positioning' section).

Before connecting the audio signals, ensure that both the subwoofer and the main monitors are switched off. Check that the subwoofer voltage selector switch is set to the correct voltage. Audio input to the subwoofer can be made via balanced XLR (LFE IN 1) or unbalanced RCA (LFE IN 2) connector. We recommend the use of balanced cables and connectors due to their better noise immunity. Do not use both inputs at the same time.

The "LINK OUT" connector can be used for

daisy-chaining several subwoofers together when high SPL is required. Simply connect a balanced XLR cable from the "LINK OUT" connector to the "LFE IN 1" connector of the next subwoofer. See section "Using multiple subwoofers".

Once all connections have been made, the subwoofer and main monitors are ready to be powered up.

Positioning in the room

The placement of the subwoofer in the room affects the overall frequency response and sound level of the system dramatically, as in low frequencies the effects of the room are strong. Even a slight change in the subwoofer's location can make a marked difference in the frequency balance and often a patient and methodical experimentation and testing is needed to find the optimum placement.

The placement will affect the phase difference between the main monitors and the subwoofer, and also the bass roll-off rate. These effects can be compensated by the use of the controls in the amplifier unit; but we recommend that at first you leave the switches untouched and concentrate on finding the position where the subwoofer gives the smoothest response, and only then use the controls to fine-tune the balance and phase alignment between the subwoofer and the main monitors.

To begin with, place the subwoofer close to the center of the front wall, however leaving at least 10 cm (4") of free space before the amplifier, driver and passive radiators. We recommend a distance of less than 90 cm / 36". This position gives increased acoustic loading (and SPL) due to the proximity of the front wall and floor. Cancellations from the front wall and floor are also avoided. Front wall cancellation for the high pass filtered main speakers can be eliminated by placing them at least 110 cm / 43" away from the

front wall. In a multichannel system the subwoofer and main monitors should ideally be positioned symmetrically and at an equal distance from the listening position.

If the frequency balance is not quite right, try moving the subwoofer slightly to the left or right so that different room modes are excited at different levels. Positioning the subwoofer close to a corner will boost the bass level at lower frequencies and may cause asymmetrical spatial imaging. If you are using two subwoofers, try placing them asymmetrically relative to the side walls. Sometimes moving the subwoofers apart into the front corners helps with problematic rear wall reflections and the loss of mutual coupling is compensated by the bass boost caused by corner positioning.

Although the HTS3 and 4 are magnetically shielded, they may cause colour distortion if placed near to very sensitive video monitors or computer displays. Move the subwoofer further away or try turning the amplifier side of the subwoofer towards the screen.

Soffit / Cabinet mounting

If the subwoofer is installed in a cabinet or flush mounted in a cavity inside a wall, sufficient space must be left around it to ensure amplifier cooling and correct functioning of the driver/passive radiator system.

The cavity must be at least 20 cm (8") wider, 10 cm (4") deeper and higher than the outer dimensions of the subwoofer. This allows leaving 10 cm (4") of space around all sides of the cabinet. The subwoofer's amplifier side must face the back of the cavity and the driver on the opposite long side of the cabinet into the room. If the cavity is covered with a drape or cloth, ensure that it does not hinder the air circulation around the subwoofer.

Setting the input sensitivity

The subwoofer requires input sensitivity alignment to the source to obtain a correctly balanced system. The input sensitivity control is located on the amplifier panel of the subwoofer. An input voltage of -6dBu with a -6dBu input sensitivity setting will produce 100dB SPL @ 1m in free field. To obtain a 110dB SPL output an input voltage of +10dBu is required when the input sensitivity is set to 0dBu.

Setting the bass roll-off switches

The acoustic response of the subwoofer may have to be matched to the characteristics of

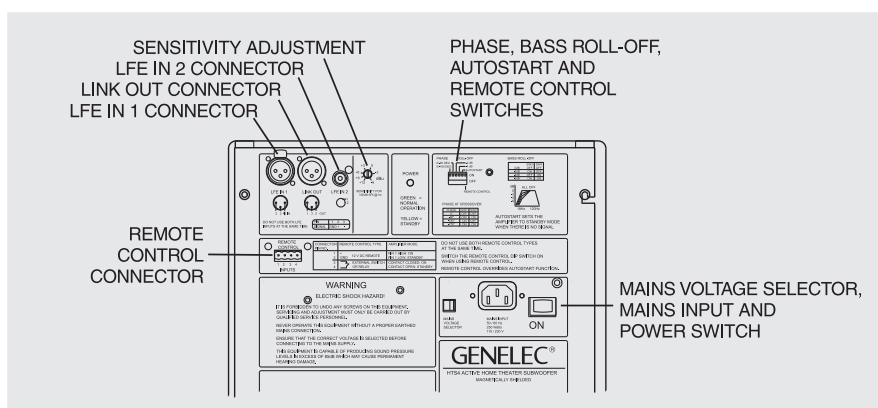


Figure 1. Connectors and controls of the HTS3 and HTS4

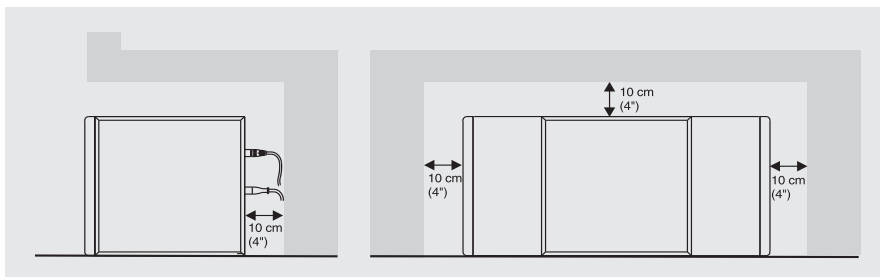


Figure 2. Minimum space requirement in a soffit/cabinet installation

the room and the positioning in which it will be used. To adjust the subwoofer to match these characteristics use the "BASS ROLL-OFF" control switches located on the amplifier panel. These switches provide an adjustment range of -6 dB in 2 dB steps. When both roll-off switches are 'off', a flat anechoic response is obtained.

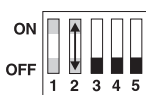
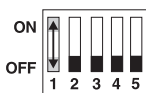
Setting the phase control

The effect of incorrect phase alignment between main speakers and subwoofer is a drop in the frequency response of the whole system at the crossover frequency. The phase difference between the main speakers and subwoofer at the listening position is dependent upon the positioning of the subwoofer. To avoid phase differences between the left and right channels and the subwoofer, the subwoofer should be placed at the center of the front speaker array.

Two phase matching switches in the crossover allow compensation for incorrect phase alignment. Four settings are provided between 0° and -270°.

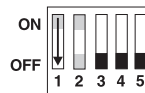
Coarse Phase Correction Method

- Configure the processor so that the main speakers (L, C, R) are set to "small" or HPF @ 120 Hz.
- Connect an audio frequency signal generator to one of the input channels used in the system.
- Set the frequency generator to 120Hz. If a signal generator is not available then it is possible to use an audio test recording with a test frequency in the range 105 Hz to 135Hz.
- Toggle the -180° phase switch 'ON' and 'OFF' and set it to the position which gives the lowest sound level at the listening position.
- Next toggle the -90° phase switch 'ON' and 'OFF', and again set it to the position which gives the lowest sound level.



- Finally, set the -180° phase switch to the opposite setting.

After the phase setting has been completed, return the speaker configuration on the processor to its' original settings.



Using multiple subwoofers

The HTS3 and 4 are equipped with a "LINK OUT" connector to provide an easy way of coupling two or more subwoofers together in high SPL applications. Connect a XLR cable from the "LINK OUT" connector of the "master" HTS3 or 4 to which the main monitor channels are connected, to the "LFE IN" connector of the other, "slave" subwoofer.

When two subwoofers connected in this way are positioned close to one another, bass level increases by 6 dB. Three subwoofers give an bass SPL increase of 9,5 dB and four subwoofers 12 dB compared to a single subwoofer. Adjust the sensitivity control of all subwoofers in the group to match the SPL level with the main monitor system. Note that the sensitivity setting must be the same on all subwoofers.

Autostart and remote control

HTS3 and HTS4 are equipped with an "AUTO-START" function, which automatically turns the amplifier to "STANDBY" mode if an input signal has not been detected for approximately five minutes, and back to "ON" mode when the signal returns. The function can be deactivated by turning the "AUTOSTART" dip switch to "off". A two-colour LED on the amplifier panel indicates the amplifier status:

Remote control type	Pole or contact	Connect to remote control input pin no.
12 V DC remote control	+	1
	-	2
External switch or relay	Contact 1	3
	Contact 2	4
Connect only one remote control unit at a time		

Table 1. Remote control connectors of the HTS3 and HTS4

green for "on" and yellow for "STANDBY".

The amplifier mode can also be switched by a remote control unit connected to the respective inputs on the amplifier. Two pairs of connectors are provided, 1 and 2 for a 12 V DC type remote control, and 3 and 4 for an external switch or relay type control. Do not connect two remote controls to the subwoofer at the same time. Remote control overrides the "AUTOSTART" function.

Automatic protection circuits

Both subwoofers have protection circuits against speaker driver thermal overload and amplifier overheating. The protection system resets automatically so the user only has to turn the input level down to ensure that it does not reactivate.

Safety considerations

The HTS3 and 4 have been designed in accordance with international safety standards. However, to ensure safe operation and maintain the instrument in safe operating condition the following warnings and cautions must be observed.

- Do not expose the subwoofer to water or moisture. Do not place any objects filled with liquid, such as vases on the subwoofer or near it.
- Servicing and adjustment must only be performed by qualified service personnel.
- Opening the amplifier panel is strictly prohibited except by qualified service personnel.
- Always use a mains power connection with protective earth. Failing to do this may lead to personal injury.

Warning!

This equipment is capable of delivering sound pressure levels in excess of 85 dB, which may cause permanent hearing damage.

Maintenance

There are no user serviceable parts inside the amplifier. Any maintenance of the unit must only be performed by qualified service personnel.

Guarantee

This product is supplied with one year guarantee against manufacturing faults or defects that might alter the performance of the unit. Refer to supplier for full sales and guarantee terms.

SYSTEM SPECIFICATIONS

	HTS3	HTS4
Free field frequency response of system:	18 Hz...120 Hz ($\pm 2,5$ dB)	
Maximum peak acoustic output capacity in quarter space (wall/floor corner) :	>114 dB SPL	>118 dB SPL
Drivers	Bass: Passive radiators:	305 mm (12") 2 x 305 mm (12")
Amplifier output power:	Short term 200 W	Short term 400 W
Amplifier system distortion at nominal output		
	THD:	<0.08%
	SMPTE-IM:	<0.08%
	CCIF-IM:	<0.08%
	DIM 100:	<0.08%
Input connectors	XLR balanced and RCA unbalanced	
Input impedance:	10 kOhm	
Link Out connector	XLR balanced	
Crossover acoustical slope:		
	Lowpass	28 db/octave
	Highpass	12 db/octave
Midband rejection, freq \geq 400 Hz	\geq 50 dB	
Bass roll-off control in 2 dB steps from 0 to -6 dB:	@ 20 Hz	
Phase matching control in 90°steps	@ 120 Hz	
Mains voltage:	100/200V or 115/230V	
Power consumption (Standby / Idle / Full output):	7/11/250 W	
Maximum ambient temperature	35°C (95°F)	
Weight	27 kg (59,5 lbs)	34 kg (74,9 lbs)
Dimensions including grilles		
	Height:	320 mm ($12\frac{5}{8}$ ")
	Width:	610 mm (24")
	Depth:	345 mm ($13\frac{9}{16}$ ")
		375 mm ($14\frac{3}{4}$ ")
		768 mm ($30\frac{1}{4}$ ")
		400 mm ($15\frac{3}{4}$ ")

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