

7040A

Operating Manual
Genelec 7040A
Active Subwoofer

GENELEC®





Genelec 7040A Active Subwoofer

Introduction

Congratulation and thank you for choosing Genelec!

Since 1978, Genelec has been guided by a single idea – to make perfect active monitors that deliver neutral and accurate sound in every kind of acoustical environment. In Genelec's quest for this ultimate goal, our unrivalled commitment to research and development has led us to continuously develop innovative driver technology, electronic circuitry, enclosure designs and many more. Our design philosophy is based on sustainability and environmental values, where industrial design serves our product acoustical performance.

Your Genelec product has been designed and manufactured with care in our factory, in Finland, using environmentally efficient solutions to give you reliable operation over many years.

Please take the time to read this manual. Happy monitoring!

General Description

The Genelec 7040A is a very compact active subwoofer for reproducing low frequencies. The 7040A extends the bass reproduction of Genelec 8010, 8020 and M030 active monitors for stereo applications. Using the 7040A extends their frequency responses down to 30 Hz (-6 dB).

Driver

The 7040A contains one 165 mm (6.5 in) magnetically shielded driver, housed in Genelec Laminar Spiral Enclosure™ (LSE™).

Bass Management

Balanced XLR connectors are used for the audio inputs and outputs. There are two input connectors and two outputs.

The bass management unit in the 7040A subwoofer splits the input into low and high frequency components at 85 Hz. Frequencies below 85 Hz are reproduced by the subwoofer. Frequencies above 85 Hz are directed via the subwoofer's output connectors to the main monitors. The subwoofer's outputs have the same level as the inputs.

The subwoofer sensitivity can be adjusted from +12 to -6 dBu to match the subwoofer sound level easily with different monitors.

Two "BASS ROLL-OFF" switches provide bass response adjustment to compensate for the acoustical environment in three 2 dB steps. Two switches allow alignment of subwoofer phase with the monitors. The phase can be adjusted in 90 degree increments between 0° and -270°.

Amplifier

A Class D power amplifier produces 50 W output power with very low THD and IM distortions. Driver overload protection

is included in the amplifier circuitry. The amplifier also incorporates thermal overload and short circuit protections. The power supply accepts mains voltages from 100 to 240 VAC.

ISS™ Autostart

The 7040A is equipped with Intelligent Signal Sensing™ (ISS™) automatic start function. ISS turns the amplifier to standby mode if no input signal has been detected for one hour. The power consumption in standby mode is less than 0.5 watts. Playback automatically resumes once an input signal is detected.

There is a slight delay in the automatic powering up. In those environments where the 7040A is required to be on all of the time, the ISS function can be disabled by setting the "ISS DISABLE" switch to the "ON" position. Then the subwoofer is continuously powered and can be turned off using the power switch on the connector panel. The default position from the factory is with "ISS DISABLE" in the OFF position.

Installation

The subwoofer is supplied with a mains cable and this operating manual. After unpacking inspect the subwoofer for possible damage in transport. Ensure that the subwoofer and the monitors are powered off before connecting cables.

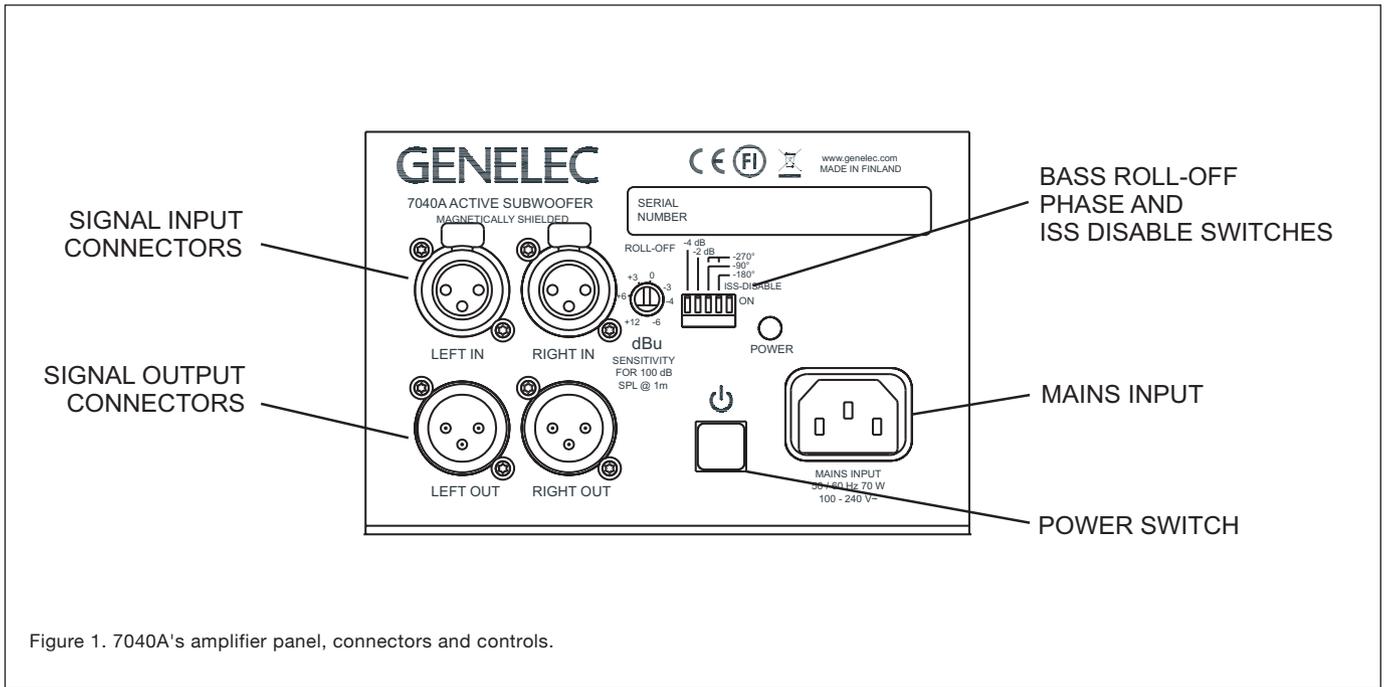


Figure 1. 7040A's amplifier panel, connectors and controls.

Audio connections to the subwoofer and monitors use balanced XLR cables (not included in the subwoofer delivery content). As the 7040A has an integrated amplifier, it may only be connected to a line level signal source, such as a mixing console or preamplifier, never to the loudspeaker outputs of a power amplifier or an integrated amplifier.

The source is connected to the "LEFT IN" and "RIGHT IN" connectors of the subwoofer. The subwoofer's output connectors "LEFT OUT" and "RIGHT OUT" are connected to the monitors.

If the signal source has unbalanced RCA outputs, you can use signal cables as shown in Figure 2.

Once all connections have been made, the subwoofer and monitors can be powered up.

Positioning In The Room

Placement of the subwoofer in the room affects the subwoofer frequency response and sound level dramatically, as the room influences the low frequencies strongly. Even a slight change in the subwoofer's location can make a marked difference in the frequency balance. Often patient and methodical experimentation is needed to find the optimum placement. The placement will also affect the phase alignment between the monitors and the subwoofer, as well as the need for bass roll-off adjustment.

First, place the subwoofer slightly offset from the center of the front wall. The distance to the nearest wall should be less than 0.6 m (24 in) measured from the subwoofer's driver. This position increases acoustic loading and sound output due to the proximity of the wall and floor. Too large a distance from the wall can cause cancellations and reduce subwoofer output. The monitor should be placed at least 1.1 m (43 in) away from walls to avoid reduction of low frequency output (see Figure 3).

If the subwoofer frequency response does not seem balanced, move the subwoofer slightly to the left or right. This changes how the room modes are excited and can result in improved flatness. Positioning the subwoofer close to a corner boosts the subwoofer output but may cause asymmetrical spatial imaging at low frequencies.

Operating Environment

The 7040A subwoofer is designed for indoor use only. The ambient temperature should be 15-35 °C (50-95 °F) and the relative humidity 20-80 %. Condensation is not allowed. If it has been stored or transported in a cool environment, the product must be allowed to warm up in its packing to the ambient temperature before connecting mains power.

Sufficient amplifier cooling and reflex port functioning is required when the

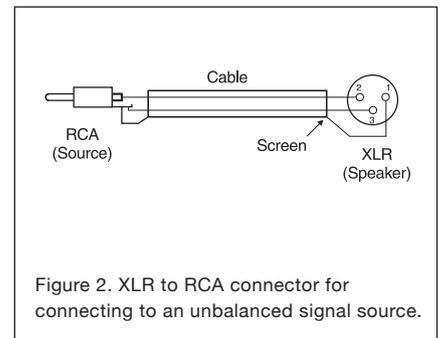


Figure 2. XLR to RCA connector for connecting to an unbalanced signal source.

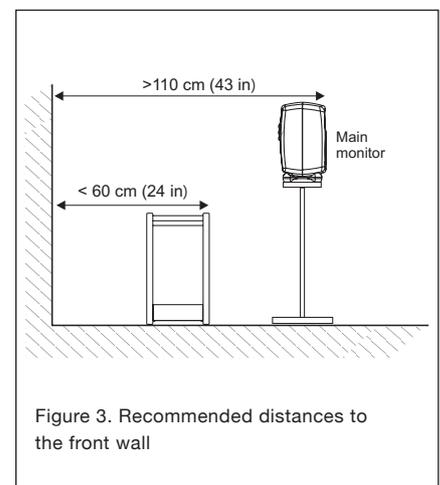


Figure 3. Recommended distances to the front wall

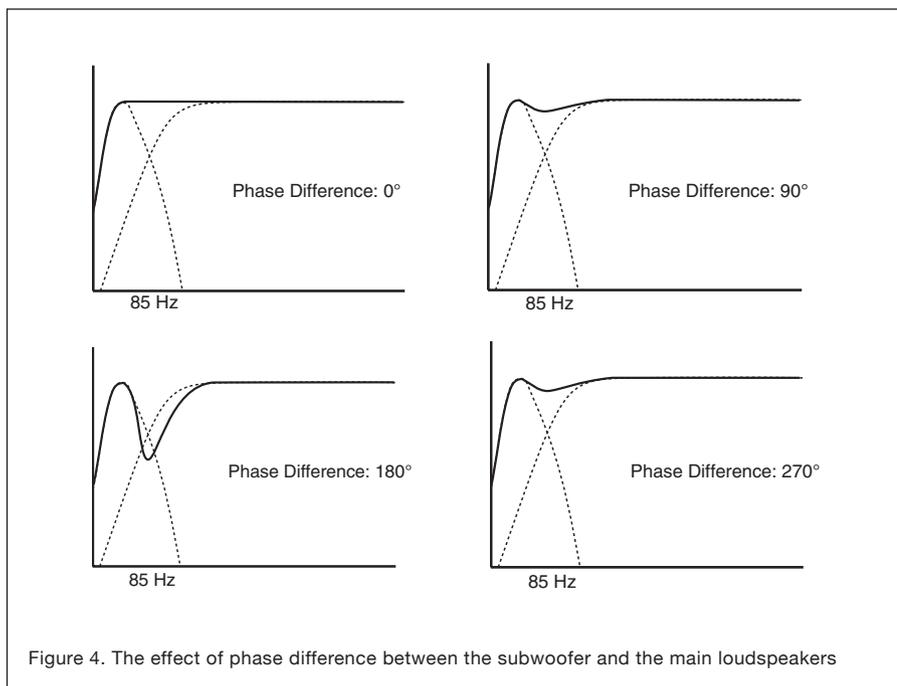


Figure 4. The effect of phase difference between the subwoofer and the main loudspeakers

subwoofer is installed in a restricted space, such as a cabinet or integrated into a wall structure. See section "Flush Mounting the Subwoofer." A restricted space must be sufficiently ventilated to prevent ambient temperature rise above 35 °C (95 °F).

Do not cover the driver of the subwoofer. Do not place the subwoofer so that there is less than 10 cm (4 in) of free space in front of the grille.

Thick carpets under the subwoofer can block the ventilation clearance needed for cooling the amplifier unit. To ensure proper functioning of the reflex port the reflex port side (opposite of the connector panel) should have a minimum clearance of 7.5 cm (3 in).

Flush Mounting the Subwoofer

If the subwoofer is flush mounted into a wall or a cabinet, ensure amplifier cooling and unrestricted airflow from the reflex port. Make the recess 7.5 cm (3 in) wider than the subwoofer. Place the subwoofer into the right end of the recess with the driver side facing the room. This leaves sufficient 7.5 cm (3 in) of free space for the reflex port. The height and depth of the recess should not be much larger than the subwoofer.

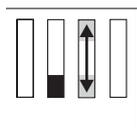
Setting the Input Sensitivity

The 7040A has the same sensitivity as 8010, 8020 and M030 monitors in free

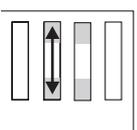
field. However, when placed near reflecting surfaces the sensitivity of 7040A typically must be attenuated due to increased wall loading. A typical initial setting for the rotary sensitivity control is -4 dBu. The +12 dBu setting provides maximum attenuation. The use of proper measuring equipment with careful listening is highly recommended.

Phase Alignment by Listening

Connect an audio frequency signal generator to LEFT IN or RIGHT IN input of the 7040A and feed in an 85 Hz tone. Connect a monitor to the corresponding output, so that the test signal is reproduced by both subwoofer and monitor.



Toggle the -180° phase switch (DIP 4 from left) "ON" and "OFF". Set it to the position giving the lowest sound level at the listening position.



Next, toggle the -90° phase switch (DIP 3) "ON" and "OFF", and again set it to the position which gives the lowest sound level.

Subwoofer placement	Bass Roll-Off setting
Near to a wall	-2 dB
In a corner	-6 dB
Flush mounted	-2 dB

Table 1. Suggested Bass Roll-Off settings

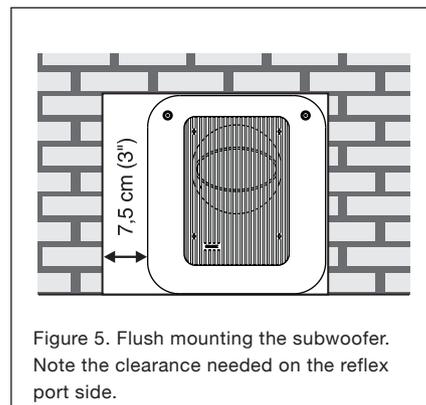
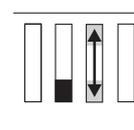


Figure 5. Flush mounting the subwoofer. Note the clearance needed on the reflex port side.



Finally, invert the -180° phase switch (DIP 4) position to the opposite setting. Now you can remove the test signal.

Phase Alignment Using Test Equipment

Feed in the test signal to LEFT IN or RIGHT IN of the subwoofer. Place the microphone at the listening position. Using a real-time analyser or other frequency response measurement system, adjust the sensitivity of the subwoofer until the frequencies below and above 85 Hz are reproduced at equal level. Then, adjust the phase switches for the maximum dip of at least -6 dB at the crossover frequency (85 Hz). Invert the -180° switch to the opposite setting. The phase is now aligned and the measurement should show a smooth response around 85 Hz.

Setting the Bass Roll-Off

The acoustic response of the subwoofer can compensate the room characteristics. To adjust the subwoofer use the "Bass Roll-Off" switches located on the connector panel. These offer attenuation levels of -2, -4, and -6 dB at the lowest subwoofer output frequencies. Table 1 provides suggestions for Bass Roll-Off

switch settings. Flat anechoic response is obtained when both roll-off switches are set to "OFF".

Safety Considerations

Genelec 7040A subwoofer has been designed in accordance with international safety standards. However, to ensure safe operation and maintain the unit 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 authorized Genelec service personnel.
- Opening the amplifier unit is strictly prohibited except by authorized service personnel.
- Always use a mains power connection with protective earth terminal. In case of fault, failing to do this may lead to personal injury.
- Free flow of air around the subwoofer is necessary to maintain sufficient cooling. Do not obstruct airflow around the subwoofer.
- Note that the subwoofer is not completely disconnected from the AC mains service unless the mains power cord is removed from the amplifier or the mains outlet. Easy access to either end of the power cord must be ensured at all times.

Warning!

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

Maintenance

No user serviceable parts are inside the amplifier unit. Any maintenance of the unit must only be performed by Genelec authorized service personnel.

Guarantee

This product is supplied with a two year guarantee against manufacturing faults or defects that might alter the performance. The guarantee can be extended to five years by registering the product on www.

genelec.com. Refer to the supplier for full sales and guarantee terms.

Compliance to FCC rules

This device complies with part 15 of the FCC Rules. Operation is subject to the following conditions:

- This device may not cause harmful interference, and
- this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment under FCC rules.

Symbols



WEEE Directive 2012/19/EU



Power/standby switch

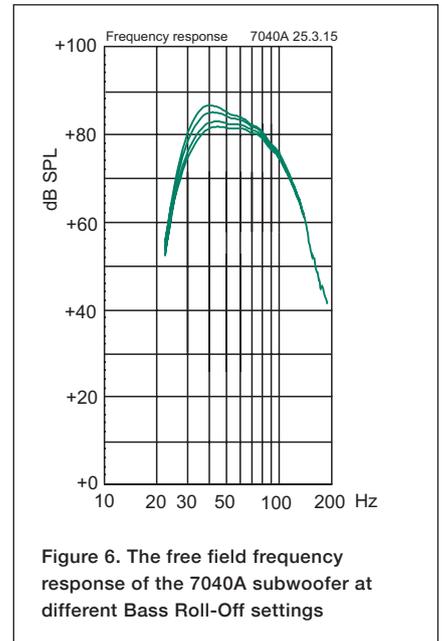


Figure 6. The free field frequency response of the 7040A subwoofer at different Bass Roll-Off settings

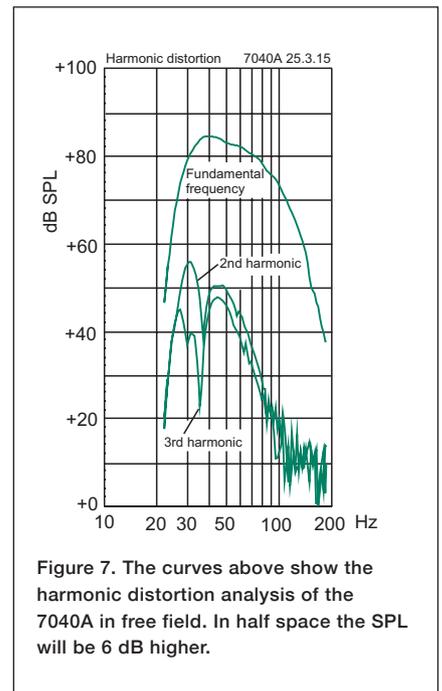


Figure 7. The curves above show the harmonic distortion analysis of the 7040A in free field. In half space the SPL will be 6 dB higher.

7040A Operating Manual

SYSTEM SPECIFICATIONS	
	7040A
Free field frequency response (-6 dB)	30...90 Hz
Accuracy of frequency response	± 3 dB (33...85 Hz)
Maximum short term sine wave SPL output averaged from 40 to 85 Hz, measured in half space at 1 meter	100 dB
Self generated noise level in half space at 1 m (A-weighted)	≤ 5 dB
Harmonic distortion at 90 dB SPL at 1 m on axis in half space 40...85 Hz	
2nd	≤ 2.5%
3rd	≤ 1.5 %
Driver, magnetically shielded	165 mm (6 ¹ / ₂ in)
Weight	11.3 kg (24.9 lb)
Dimensions	
Height	410 mm (16 ¹ / ₈ in)
Width	350 mm (13 ³ / ₄ in)
Depth	205 mm (8 ¹ / ₁₆ in)

CROSSOVER SECTION	
	7040A
Subsonic filter (18 dB/octave) below	35 Hz
Input channels	2
High pass frequency for main channel outputs	85 Hz
Midband rejection >400 Hz	≥ 50 dB
Bass Roll-Off control in 2 dB steps	0 to -6 dB @ 35 Hz
Phase matching control in 90° steps	0 to -270°
Input sensitivity control	+12 to -6 dBu

AMPLIFIER SECTION	
	7040A
Amplifier short term output power (Long term output power is limited by driver unit protection circuitry)	50 W
Amplifier system THD at nominal output	≤ 0.08 %
Mains voltage	100 - 240 VAC universal
Power consumption (average)	
Standby (ISS active)	≤ 0.5 W
Idle	5 W
Full output	70 W

INPUT SECTION	
	7040A
Input connectors XLR female	
pin 1	gnd
pin 2	+
pin 3	-
Input impedance	10 kohm balanced
Input level for 100 dB SPL output @ 1 m	Variable from +12 to -6 dBu

OUTPUT SECTION	
	7040A
Input connectors XLR male	
pin 1	gnd
pin 2	+
pin 3	-
Main monitor Out gain	0 dB