# 7300 Series

Operating Manual

Genelec 7360A and 7370A
Smart Active Subwoofers

GENELEC®



750-7360A/7370A

# Genelec 7360A and 7370A Smart Active Subwoofers

## Introduction

Congratulations and a thank-you for the purchase of this Genelec 7300 series subwoofer. This manual addresses setting up and using the Genelec 7360A and 7370A subwoofers. These subwoofers are designed to integrate easily into all environments, both those using analog audio as well as those using digital AES/EBU audio. Genelec 7360A and 7370A subwoofers are designed for precise monitoring of multichannel analog audio signals and stereo AES/EBU signals. Multichannel AES/EBU signal can be monitored by using the 9301 multichannel digital audio interface device connected to the subwoofer.

Energy saving Intelligent Signal Sensing (ISS) can be turned on to put the subwoofer automatically into a standby state when audio signal has been absent for a selected time. In the standby mode the product consumes less than one Watt of power. Upon sensing an input signal the subwoofer automatically wakes up to full operation. The wait until entering the ISS power save can be configured using the GLM software. When the ISS is active you can have your monitoring system ready for action at all times.

## Installation

Each subwoofer is supplied with a mains cable, one 5 m GLM network cable, mains cable, and an operating manual. Before connecting switch the subwoofer and monitors off.

### Connections

**Seven balanced XLR input/output pairs** are available for analog signals (see Figure 1). There is a dedicated **LFE In and LFE Out**. The **Link In and Link Out** connectors can be used to for daisy-chaining multiple subwoofers with minimum cable count. In addition to these analog signal connectors, **digital audio in and out** connectors supporting AES/EBU format are available. The digital out connector can be used to daisy chain multiple subwoofers while digital audio is being used.

Multichannel AES/EBU signal can be monitored by using the 9301 multichannel digital audio interface device connected to the subwoofer.

**Two CAT5 (RJ45) GLM Network connectors** are available for computer control using the Genelec Loudspeaker Manager (GLM) software.

**Bypass** connector supports a ¼ in jack switch-operated subwoofer bass management bypass function when the fixed 85 Hz subwoofer crossover is used.

The **mains input** supports a wide mains voltage range (100-240 VAC, 50-60 Hz) and enables the subwoofer to be plugged in anywhere globally. If the mains power is provided with a generator, inverter or certain lower-quality UPS devices, we recommend filtering of the mains power voltage harmonics and taking care that the voltage supply is stable.

## Bass Management

Bass management splits the signal from each input into low and high frequency components. Signal content below the crossover frequency is reproduced by the subwoofer and signal content above the crossover frequency is reproduced by the monitors connected to the outputs of the subwoofer.

The 7360A and 7370A offer two bass management methods:

### Centralized bass management

This method builds both the highpass and the lowpass filters in the subwoofer and can be used in all setups, with or without GLM control. A fixed 85 Hz crossover filter for the analog main channels is default for manual use.

In this method all analog signal cables are routed through the subwoofer's IN/OUT connectors to the respective main monitors.

### Distributed bass management

In this method the lowpass filter is applied in the subwoofer and the highpass filter in the monitor, and these are set in synchrony using the GLM control network. This method is only available in systems where GLM is used.

The GLM software enables adjusting the subwoofer/monitor crossover from 50 Hz to 100 Hz when distributed bass management is used.

The distributed bass management supports three different signal cabling configurations:

- All channels routed through the subwoofer's IN/OUT connectors to the respective monitors.
- Y-cables from the source to the subwoofer's IN connector and the monitor's signal input.
- Signal sources with dual outputs for each channel.

## Using With GLM™ Control Network

Subwoofers are fully compatible with Genelec Loudspeaker Manager GLM™ and the proprietary Genelec monitor control network and Genelec SAM monitors. Using the GLM control method unleashes the full room compensation power in the subwoofer, with 20 parametric room compensation filters. This level of room compensation detail is only available when the GLM is used. Use with the GLM™ network is described in the DSP System Operating Manual.

### System setup

Although the subwoofer can be used without the GLM™ software and control network, they only reach their full potential when set up and calibrated using the GLM™ software. Genelec Loudspeaker Manager GLM™ and the proprietary Genelec monitor control network offer automated acoustic equalization and alignment for any reproduction system from simple stereo to very complex 3D immersive setups including also one or more subwoofers. GLM setup is fast and accurate and can precisely address the typical narrow-band low frequency mode resonances of a room. The settings can be controlled with a computer or be permanently stored in the monitors to make the setup available at all times even when a computer is not in use. Genelec recommends setting up SAM monitoring systems using GLM. You can find a detailed description of the setup and the use of GLM™ in the GLM™ System Operating Manual.

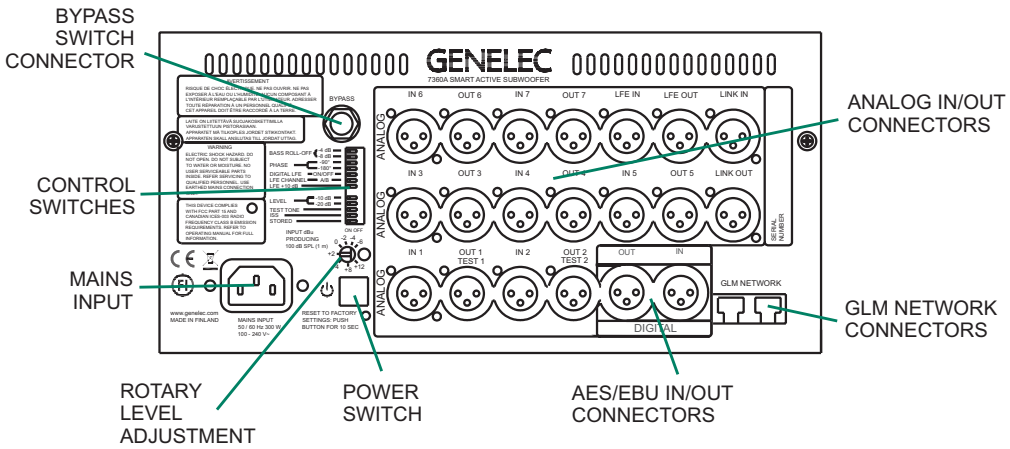



**Figure 1. Connector panel of the 7360A. The 7370A is similar.**

The setup is fast and consists of the following steps:

- Connect a CAT5 (RJ45) cable between each monitor (and subwoofer) and finally to the control network input of the GLM Adapter device (see Figure 1).
- Connect the GLM Adapter device to computer USB connector.
- Using a microphone stand, place the Genelec measurement microphone at the listening location with the microphone pointing upwards and the microphone top at the height of the engineer's ear. The microphone is a part of the GLM User Kit.
- Connect the microphone cable to the microphone input in the GLM Adapter device.
- Download the GLM software at the Genelec web site (www.genelec.com).
- Install the GLM software and follow the instructions in the software to measure and set up your system.
- If you plan to not use a computer for controlling the monitors, use the GLM software to write the setting into the monitors (use menu item "Store | Store the Current Group Settings…").

While the GLM network is disconnected the settings stored using the Genelec Loudspeaker Manager software can be selected in use by setting the STORED switch ON.

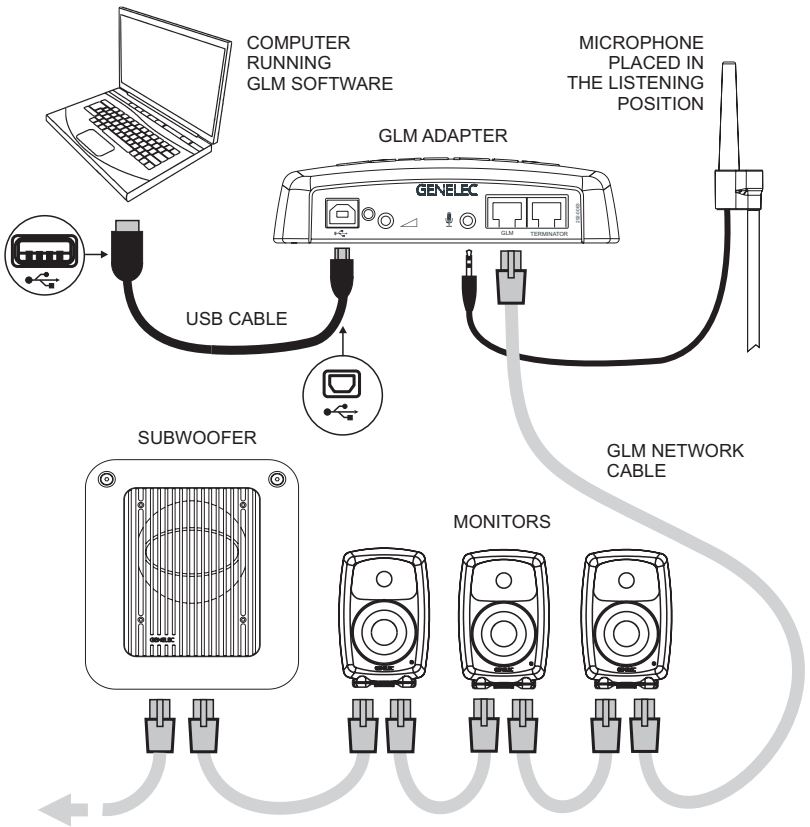



**Figure 2. GLM Network cabling. Audio cabling not shown.**

## Using Without GLM

### Cabling

The 7300 series subwoofers can be easily set up using the fixed 85 Hz analogue crossover filter. This fixed crossover filter is on as a factory setting and highpass filters the analogue outputs on the subwoofer. When using this method, run each signal cable first to the subwoofer. Then, run the respective output to the monitor. This monitor feed signal is highpass filtered at 85 Hz.

When using the LFE signal, run the LFE signal to the subwoofer LFE in connector.

When daisy-chaining multiple subwoofers, run a cable from the Link Out connector the next subwoofer's Link In

connector. When using the LFE signal, also run a cable from the LFE Out to the next subwoofer's LFE In.

**Control Switches**

**BASS ROLL-OFF** controls compensate for the very low frequency boost, reducing the 20 Hz level in 4 dB steps. The settings add to a total of 12 dB attenuation. Setting both switches to "OFF" obtains a flat response.

**PHASE** switches can put the subwoofer in phase with a selected main monitor. Incorrect phase alignment can cause a drop in level at the crossover frequency. See chapter "Setting the Phase Switches."

**Digital LFE** switch selects the low pass frequency for the subframe selected to reproduce LFE (see "LFE CHANNEL" below). The frequencies are 85 Hz for "OFF" and 150 Hz for "ON."

**LFE CHANNEL A/B** selects which subframe carries the LFE signal. "ON" for A, "OFF" for B. If A is selected for LFE, the B subframe is assumed to carry main channel audio.

**LFE +10 dB** function adds +10 dB of gain. See chapter "Using the LFE +10 dB function."

**LEVEL** switches scale down the subwoofer output level. The switch settings add up and combine with therotary level adjustment control.

**TEST TONE** switch activates the 85 Hz test tone used for calibrating the phase. See chapter "Setting the Phase Switches."

**ISS** switch activates the signal sensing automatic energy saving function.

**STORED** switch selects the settings stored inside the memory of the subwoofer and settings made by the subwoofer's controls. The stored settings are set using the GLM Loudspeaker Manager Software and the GLM control network and provide superior functionality compared to subwoofer's own controls.

## Connector Panel Light

Normally, the light on the connector panel is green, indicating normal operational mode. Red colour indicates amplifier clipping and yellow indicates thermal overload.If the red or yellow warning light appears, turn down the level.

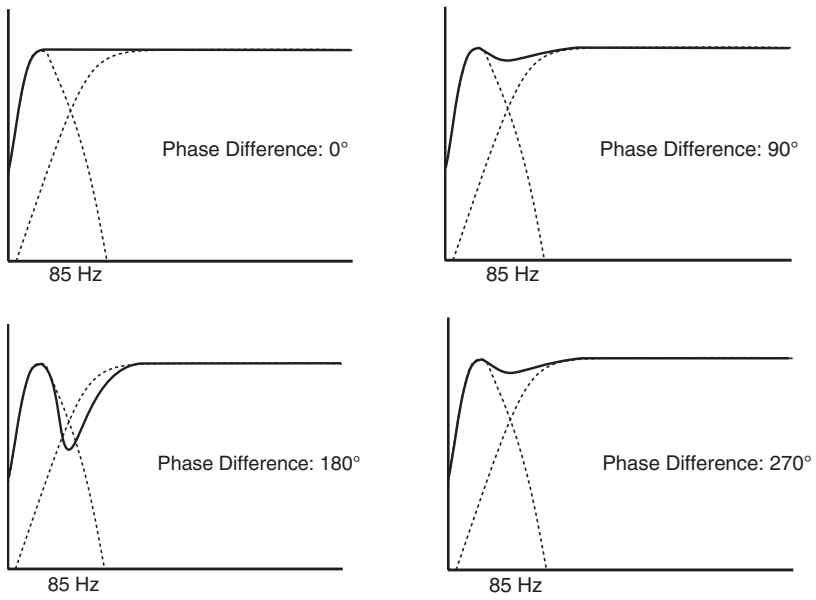



**Figure 3. The effect of phase difference between the subwoofer and the main monitors**

## Setting the Phase Switches

Incorrect phase alignment between main monitors and subwoofer causes a drop in the frequency response of the whole system at the crossover frequency. Figure 3 shows the effect of phase difference to the frequency response.

The phase difference between the main monitors and subwoofer at the listening position depends on the position of the subwoofer, so the phase adjustment should be done only after the preferred position is found and subwoofer and monitor levels have been aligned. GLM software control adjusts the phase automatically, but if GLM is not available, the following manual phase matching can be applied.

## Manual Phase Adjustment Method

Genelec 7360A and 7370A subwoofers are equipped with a built-in 85 Hz frequency test tone generator for phase alignment. The test tone generator is connected to the subwoofer's "TEST 1" output. Connect temporarily the monitor to this output for manual phase alignment.

Power up the system and set the TEST TONE switch to "ON." Now you can hear an 85 Hz test signal from the subwoofer and the main monitor connected to the center channel output.

1. Toggle the -180° phase switch on and off, and set it to the position which gives the lowest sound level at the listening position.
2. Next toggle the -90° phase switch on and off, and again set it to the position which gives the lowest sound level.
3. Finally, set the -180° phase switch to the opposite setting and deactivate the test signal. The phase adjustment is now complete.

## Using the LFE +10 dB Function

Dolby Digital and DTS encoding formats present the LFE channel with +10 dB gain relative to the main channels. Surround sound decoders may automatically add +10 dB of LFE gain to restore the level balance.

The "LFE +10 dB" function can add the +10 dB of gain to the LFE channel in the production stage if it is not already done by the source connected to the monitoring system. Switching the "LFE +10 dB" switch to the "ON" position activates the function. If the LFE output is at a 10 dB higher level than other (non-LFE) channels, this switch

should be set to “OFF”.

The “LFE +10 dB” function should not be used in the following cases:

- If the +10 dB LFE gain is already implemented by another device, for example, a surround sound processor or the output matrix of a mixing console.
- When producing an audio format that does not require the use of +10 dB gain on the LFE channel.

## Additional Information

### Positioning Subwoofer in Room

The location of the subwoofer can affect the frequency response and sound level dramatically particularly when the room acoustic effects are strong. Even small changes in a subwoofer's location can make a marked difference in the frequency response. To begin, place the subwoofer at the front wall slightly offset from the room center line. Often methodical experimentation is needed to find the location giving the flattest frequency response at the listening location. Usually the subwoofer is placed close to a wall as this usually creates the highest output. Positioning the subwoofer close to a corner will boost the bass level at lower frequencies and may also cause asymmetrical spatial imaging. Measured from the subwoofer's driver the recommended distance to a wall is less than 0.6 m (24 in). Cancellations from the wall are then avoided.

### Operating Environment

These subwoofers are designed for indoor use only. The permissible ambient temperature is 15-35 degrees Celsius (50-95°F) and relative humidity 20% to 80% (noncondensing). When the product has been stored or transported in cool environment and is taken into a warm room, wait 0.5-1 hours before opening packing to prevent condensation of humidity before connecting to mains power.

### Minimum Clearances

Do not cover the grille or place the subwoofer so that there is less than 0.1 m (4 in) of free space in front of the grille. The space must be ventilated or sufficiently large to dissipate heat so that the ambient temperature does not rise above 35 degrees Celsius (95°F). Make sure that the space under the subwoofer allows air flow. Thick carpets may block ventilation needed for cooling the electronics. The reflex port opening should have a clearance of at least 7.5 cm (3 in) to ensure functioning of the reflex port.

### Flush Mounting

When the subwoofer is flush mounted in a wall or cabinet, ensure unrestricted airflow in the reflex port and amplifier cooling. Make the recess 7.5 cm (3 in) wider than the subwoofer. Place the subwoofer to the right side of the recess if the driver is facing the room. This leaves sufficient free space at the reflex port side. The height and depth of the recess should not be much bigger than needed for ventilation as this may cause unwanted acoustic effects.

## Maintenance

There are no user serviceable parts inside the subwoofer. Maintenance or repair must only be done by a Genelec certified service.

## Guarantee

Genelec guarantees the subwoofers for two years against manufacturing faults or defects altering performance. Refer to the reseller for full sales and guarantee terms.

## Safety Considerations

The 7360A and 73700A have been designed in accordance with international safety standards. To ensure safe operation, the following warnings and precautions must be observed:

- Servicing and adjustment must only be performed by a Genelec certified service.
- The subwoofer enclosure must not be opened.
- Do not use this product with a mains cable or mains outlet having no protective earth (potential equalizing) connection as doing so may result in personal injury.
- To prevent fire or electric shock, do not expose the product to water or moisture.
- Do not place objects filled with liquid, such as vases, on the subwoofer or near it.
- The amplifier is not completely disconnected from the mains power unless the mains cable is removed from the amplifier or the mains outlet.
- Free flow of air behind and around the subwoofer is necessary to maintain sufficient cooling. Do not obstruct airflow around the subwoofer.
- These subwoofers are capable of producing sound pressure levels in excess of 85 dB, which may cause a permanent hearing damage.

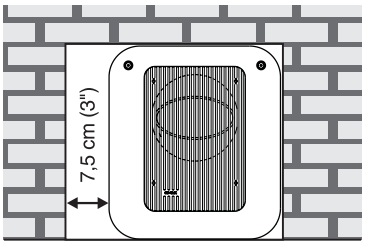



**Figure 4. Flush mounting the subwoofer. Note the clearance needed on the reflex port side.**

## Compliance to FCC Rules

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

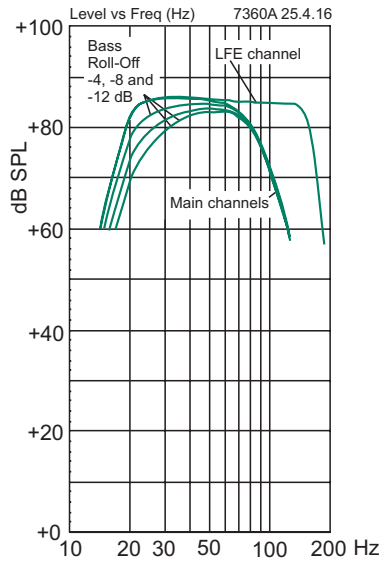



**Figure 5. The curves above show the main channel's frequency response with 85 Hz lowpass filtering, the frequency response of the LFE channel and the effect of the Bass Roll-Off adjustment to the response of the 7360A.**

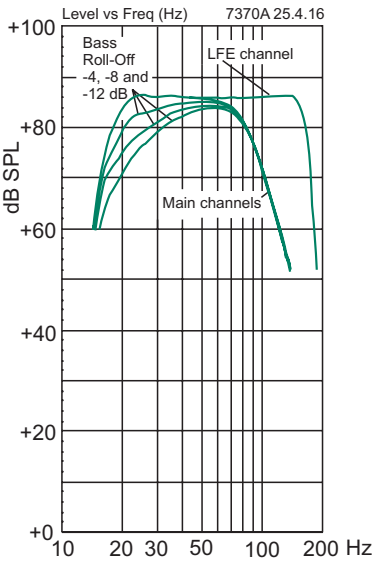



**Figure 6. The curves above show the main channel's frequency response with 85 Hz lowpass filtering, the frequency response of the LFE channel and the effect of the Bass Roll-Off adjustment to the response of the 7370A.**

## SPECIFICATIONS

| Model | 7360A | 7370A |
|---|---|---|
| Lower cut-off frequency -6 dB | 19 Hz | 19 Hz |
| Upper cut-off frequency -6 dB (main channel/LFE) | 100 Hz/150 Hz | 100 Hz/150 Hz |
| Accuracy of frequency response +/-3 dB | 19 Hz - 100 Hz | 19 Hz - 100 Hz |
| Driver | 250 mm (10 in)<br>(magnetically shielded) | 305 mm (12 in)<br>(no magnetical shielding) |
| Harmonic distortion at 1 m on axis in half space, 30 to 85 Hz | 2nd ≤ 3% @ 90 dB SPL<br>3rd ≤ 2% @ 90 dB SPL | 2nd ≤ 3% @ 95 dB SPL<br>3rd ≤ 3% @ 95 dB SPL |
| Maximum short term sine wave SPL output averaged from 30 to 85 Hz, measured in half space at 1 meter | ≥ 109 dB SPL | ≥ 113 dB SPL |
| Maximum peak SPL output with random pink noise, measured in half space at 1 meter | ≥ 114 dB SPL | ≥ 118 dB SPL |
| Self generated noise at 1 m on axis (A-weighted) | < 5 dB | |
| Weight | 27 kg | 48 kg |
| Dimensions H x W x D | 527 x 462 x 365 mm<br>$20^{3}/_{4}$ x $18^{3}/_{16}$ x $14^{3}/_{8}$ in | 625 x 555 x 496 mm<br>$24^{5}/_{8}$ x $21^{7}/_{8}$ x $19^{1}/_{2}$ in |

## AMPLIFIER SECTION

| | | |
|---|---|---|
| Short term amplifier output power<br>(Long term output power is limited by driver unit protection circuitry) | 300W | 400W |
| Amplifier system THD at nominal output | ≤ 0.01% | |
| Mains voltage | 100-240 VAC 50/60 Hz | |
| Power consumption<br>Standby, ISS active<br>Idle<br>Full output, peak | <br><1 W<br>15 W<br>300 W | <br><1 W<br>20 W<br>400 W |

## SIGNAL PROCESSING SECTION

| | |
|---|---|
| Analog signal input connector XLR female, balanced 10 kOhm | pin 1 gnd, pin 2 non-inverting, pin 3 inverting |
| Maximum analog input signal<br>Analog input sensitivity (100 dB SPL at 1 m) rotary level adjustment | +25.0 dBu<br>+12 to -6 dBu |
| Digital signal input connector XLR female 110 Ohm<br>Digital signal output / Thru connector XLR male 110 Ohm | AES/EBU Single Wire<br>AES/EBU Single Wire |
| Digital audio input<br>Word length<br>Sample rate<br>Digital input sensitivity(100 dB SPL at 1 m ) rotary level adjustment | <br>16 - 24 bits<br>32 - 192 kHz<br>-30 dBFS |
| Subsonic filter (18 dB/octave) below | 19 Hz |
| Control network<br>Type<br>Connection | <br>Proprietary GLM™ network<br>2 RJ45, CAT5 cables |
| GLM™ software frequency response adjustment parametric notch filters | 20 |
| System calibration | Genelec GLM AutoCal™ |
| Crossover subwoofer/subwoofer output channels<br>Centralized Bass Management<br>Distributed Bass Management (GLM control only) | <br>Subwoofer: low pass 85 Hz, output: high pass 85 Hz<br>Subwoofer: low pass 50-100 Hz, output: no filtering |
| LFE cutoff | 150 Hz |
| Midband rejection >400 Hz | ≥ 50 dB |
| Bass Roll-Off control operating range in 4 dB steps | 0 to -12 dB at 20 Hz |
| Phase matching control | 90° steps with dip switch controls<br>15° steps with GLM control |

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