

# GENELEC®

# 4020A

Operating Manual





# 4020A

## Active Loudspeaker

### General

The bi-amplified Genelec 4020A is an extremely compact two way active loudspeaker designed for fixed installations. As an active loudspeaker, it contains drivers, power amplifiers, active crossover filters and protection circuitry. The 4020A is designed for indoor use only, in temperatures between 15 to 35 degrees Celsius and relative humidity between 20 % and 90 %.

The MDE™ (Minimum Diffraction Enclosure™) loudspeaker enclosure is made of die-cast aluminium and shaped to reduce edge diffraction. Combined with the advanced Directivity Control Waveguide™ (DCW™), this design provides excellent frequency balance in difficult acoustic environments.

### Positioning the loudspeaker

Each 4020A is supplied with an integrated amplifier unit, mains cable, a 5-pin connector for audio signal and 12 V trigger voltage, a keyhole type wallmount and an operating manual. After unpacking, place the loudspeaker in its required listening position, taking note of the line of the acoustic axis. The axis should be pointed towards the center of the listening area.

### Connections

Before connecting up, ensure that the loudspeakers and the signal source have been switched off. The power switch of the 4020A is located on the back panel (see Figure 3). Connect the loudspeaker to an earthed mains connection with the supplied mains cable. Never connect the loudspeaker to an un-

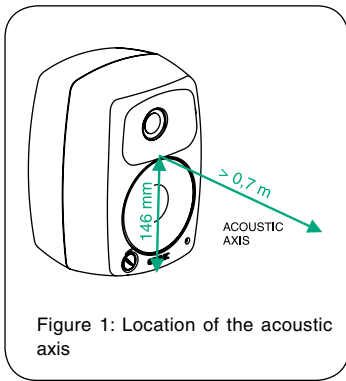


Figure 1: Location of the acoustic axis

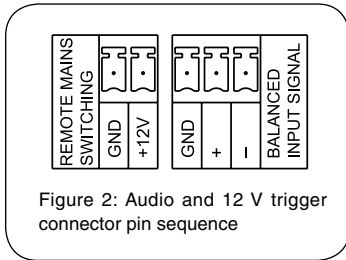


Figure 2: Audio and 12 V trigger connector pin sequence

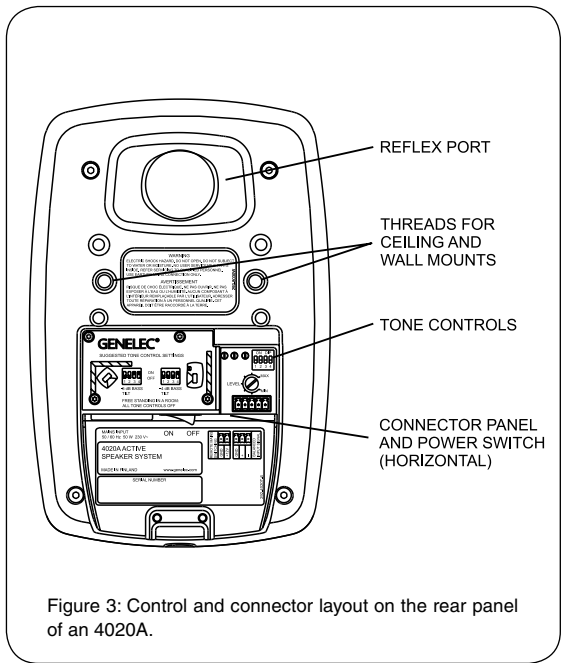


Figure 3: Control and connector layout on the rear panel of an 4020A.

earthed mains supply or using an unearthed mains cable. Audio input is via a 10 kOhm balanced connector. The connector also has two pins for 12 V trigger voltage for power switching. The current fed into the 12 V trigger connection must not exceed 200 mA. The pin sequence of the connector is shown in Figure 2.

Connect the signal cable and 12 V trigger voltage to the 5-pole plug provided with the loudspeaker and secure the connections by tightening the screws on each pole. Push the plug into the connector on the loudspeaker.

Never connect the 4020A to the loudspeaker outputs of a power amplifier or an integrated amplifier or receiver.

Once the connections have been made, the loudspeakers are ready to be switched on.

## Level control

The input sensitivity of the loudspeaker can be matched to the output of the signal source by adjusting the level control on the rear panel.

## Setting the tone controls

The frequency response of the Genelec 4020A can be adjusted to match the acoustic environment by setting the tone control switches on the rear panel. The controls are “Treble Tilt”, “Bass Tilt” and “Bass Roll-Off”. An acoustic measuring system such as WinMLS or comparable is recom-

Loudspeaker Mounting Position	Treble Tilt	Bass Tilt	Bass Roll-Off
Flat anechoic response	OFF	OFF	OFF
Free standing in a damped room	OFF	OFF	OFF
Free standing in a reverberant room	OFF	-2 dB	OFF
Near field or desktop	OFF	-4 dB	OFF
Near to a wall	OFF	-6 dB	OFF

Table 1: Suggested tone control settings for differing acoustical environments

mended for analyzing the effects of the adjustments, however, careful listening with suitable test recordings can also lead to good results if a test system is not available. Table 1 shows some examples of typical settings in various situations. Figure 4 shows the effect of the controls on the anechoic response.

### Treble Tilt

The Treble Tilt control (switch 1) attenuates the treble response of the loudspeaker at frequencies above 5 kHz by 2 dB, which can be used for smoothening down an excessively bright sounding system.

### Bass Tilt

The Bass Tilt control offers three attenuation levels for the bass response of the loudspeaker below 2 kHz, usually necessary when the loudspeakers are placed near a wall or other room boundaries. The attenuation levels are -2 dB (switch 3 "ON"), -4 dB (switch 4 "ON") and -6 dB (both switches "ON").

### Bass Roll-Off

The Bass Roll-Off (switch 2) activates high-pass filtering at 85 Hz to match the low frequency cutoff of the 4020A to subwoofers using 85 Hz low-pass filtering.

The factory setting for all tone controls is "OFF" to give a flat anechoic response. Always start adjustment by setting all switches to "OFF" position. Measure or listen systematically through the different combinations of settings to find the best frequency balance.

## Mounting considerations

### Align the loudspeakers correctly

Always place the loudspeakers so that their acoustic axes (see figure 1) are aimed towards the center of the listening area. Only vertical placement is preferred, as it minimises acoustical cancellation problems around the crossover frequency.

### Minimise reflections

Acoustic reflections from objects close to the loudspeakers like walls, cabinets etc. can cause unwanted colouration blurring of the sound image. These can be minimised by placing the loudspeaker clear of reflective surfaces.

## Minimum clearances

Sufficient clearance for cooling of the amplifier and functioning of the reflex port must be ensured if the loudspeaker is installed in a restricted space such as a cabinet or integrated into a wall structure. The surroundings of the loudspeaker must

always be open to the listening room with a minimum clearance of 3 centimeters ( $1\frac{3}{16}$ " ) behind, above and on both sides of the loudspeaker. The space adjacent to the amplifier must either be ventilated or sufficiently large to dissipate heat so that the ambient temperature does not rise above 35 degrees Celsius (95°F)

## Mounting options

The Genelec 4020A offers several mounting options: On the base of the loudspeaker is a 3/8" UNC threaded hole compatible with a standard microphone stand. On the rear there are two M6x10 mm threaded holes for Omnimount® size 20.5 brackets or the keyhole wall mount adapter provided with the loudspeaker. See Genelec Accessories Catalogue on [www.genelec.com](http://www.genelec.com) for a complete list of mounting hardware options.

## Maintenance

No user serviceable parts are to be found within the amplifier unit. Any maintenance or repair of the 4020A unit should only be undertaken by qualified service personnel.

## Safety considerations

Although the 4020A has been designed in accordance with international safety standards, the following warnings and cautions should be observed to ensure safe operation and to maintain the loudspeaker under safe operating conditions:

- Servicing and adjustment must only be performed by qualified service personnel. The loudspeaker must not be opened.
- Do not use this product with an unearthed mains cable or an unearthed mains

connection as this may compromise electrical safety.

- Do not expose the loudspeaker to water or moisture. Do not place any objects filled with liquid, such as vases on the loudspeaker or near it.
- This loudspeaker is capable of producing sound pressure levels in excess of 85 dB, which may cause permanent hearing damage.
- Free flow of air behind the loudspeaker is necessary to maintain sufficient cooling. Do not obstruct airflow around the loudspeaker.
- Note that the amplifier is not completely disconnected from the AC mains service unless the mains power cord is removed from the amplifier or the mains outlet.

## Guarantee

This product is guaranteed for a period of two years against faults in materials or workmanship. Refer to supplier for full sales and guarantee terms.

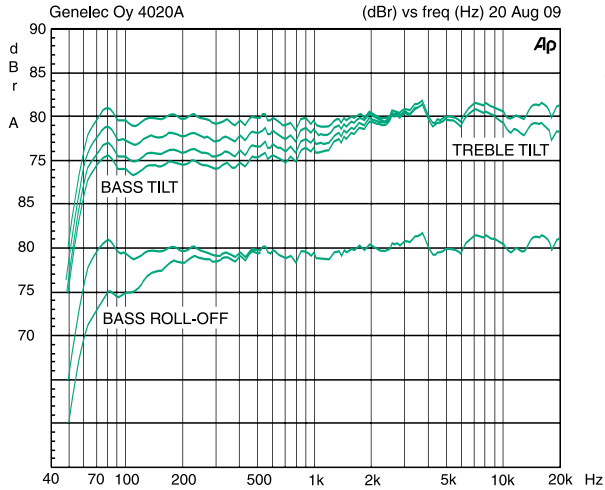


Figure 4. The curves show the effect of the “Bass Tilt”, “Treble Tilt” and “Bass Roll-Off” controls on the free field response of the 4020A

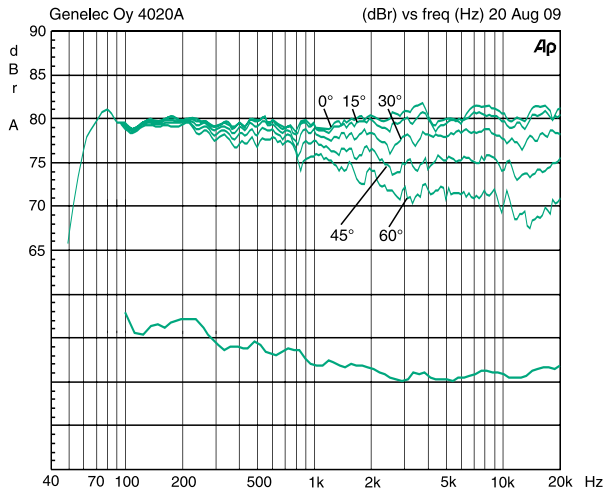


Figure 5. The upper curve group shows the horizontal directivity characteristics of the 4020A measured at 1 m. The lower curve shows the system's power response.

## SYSTEM SPECIFICATIONS

Lower cut-off frequency, -3 dB:  $\leq 65$  Hz

Upper cut-off frequency, -3 dB:  $\geq 21$  kHz

Free field frequency response of system:  
66 Hz – 20 kHz ( $\pm 2.5$  dB)

Maximum short term sine wave acoustic output on axis in half space, averaged from 100 Hz to 3 kHz:  
@ 1 m  $\geq 96$  dB SPL  
@ 0.5 m  $\geq 102$  dB SPL

Maximum long term RMS acoustic output in same conditions with IEC weighted noise (limited by driver unit protection circuit):  
@ 1 m  $\geq 95$  dB SPL

Maximum peak acoustic output per pair on top of console, @ 1 m distance with music material:  $\geq 105$  dB

Self generated noise level in free field @ 1m on axis:  
 $\leq 10$  dB (A-weighted)

Harmonic distortion at 85 dB SPL @ 1m on axis:  
Freq: 50...100 Hz < 3 %  
> 100 Hz < 0.5 %

Drivers: Bass 105 mm (4") cone  
Treble 19 mm ( $\frac{3}{4}$ ") metal dome  
Both drivers are magnetically shielded

Weight: 3.6 kg (7.9 lb)

### Dimensions:

Height 226 mm ( $8\frac{7}{8}$ ")  
Width 151 mm (6")  
Depth 142 mm ( $5\frac{5}{8}$ ")

## EC DECLARATION OF CONFORMITY

This is to certify that the Genelec 4020A Active Loudspeaker conforms to the following standards:

Safety: EN 60065:2002 + A1:2006 / IEC 60065:2001  
7th Edition + A1: 2005  
EMC: EN 55020 A2: 2008  
EN 55013: (2001)+ A1 : 2003 + A2: 2009  
EN 61000-3-2: 2006  
EN 61000-3-3 A2: 2005

The product herewith complies with the requirements of The Low Voltage Directive 2006/95/EC and EMC Directive 2004/108/EC

Signed:   
Position: Chairman of the Board  
Date: 14-July-2009

## CROSSOVER SECTION

Input connector: Balanced 10 kOhm

Input level for 100 dB SPL output at 1 m:  
-6 dBu at volume control max

Volume control range:  
-40 dB relative to max output

Crossover frequency, Bass/Treble: 3.0 kHz

Treble Tilt control operating range:  
0 to -2 dB @ 15 kHz

Bass Roll-Off control operating in a -6 dB step @ 85 Hz

Bass Tilt control operating range in -2 dB steps:  
0 to -6 dB @ 100 Hz

The 'CAL' position is with all tone controls set to 'off' and the input sensitivity control to maximum (fully clockwise).

## AMPLIFIER SECTION

Bass amplifier output power with an 8 Ohm load: 20 W  
Treble amplifier output power with an 8 Ohm load: 20 W  
Long term output power is limited by driver unit protection circuitry.

Amplifier system distortion at nominal output:  
THD  $\leq 0.08$  %  
SMPTE-IM  $\leq 0.08$  %  
CCIF-IM  $\leq 0.08$  %  
DIM 100  $\leq 0.08$  %

Signal to Noise ratio, referred to full output:  
Bass  $\geq 95$  dB  
Treble  $\geq 95$  dB

Mains voltage: 100, 120, 220 or 230 V  
according to region

Voltage operating range:  $\pm 10$  %  
Power consumption:  
Idle 5 VA  
Full output 50 VA

# GENELEC®

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