

AOW312B

Operating Manual

Genelec AOW312B
Active On-Wall Loudspeaker

GENELEC®





Genelec AOW312B Active On-Wall Loudspeaker

System

The Genelec AOW312B is a three-way active loudspeaker system designed for medium sized, high quality home theater applications. This system excels as side or rear channels when mounted on-wall. It also offers minimum intrusion into designed spaces while providing high sound pressure levels required when employing Genelec's large three-way systems for left, center, and right positions and HTS6 series subwoofer in rooms greater than 260 m³/9000 cu. ft.

Designed as an active loudspeaker system, each AOW312B system contains an individually matched RAM4 amplifier unit with multiple power amplifiers, active crossover filters and protection circuitry.

The unique Directivity Control Waveguide™ (DCW™) technology developed by Genelec provides extremely stable and accurate imaging and frequency balance even in difficult acoustic environments. Furthermore, versatile and precise crossover controls allow for accurate matching of the loudspeakers systems to different room acoustic conditions.

The AOW312B is fixed to the wall via unique mounting brackets which isolate and

suspend the enclosure vertically. The brackets also allow the enclosure to be mounted with a ±15 degree angle offset to the wall to facilitate energy focus at desired listening locations.

All electronics are factory calibrated as a single unit, thus eliminating the effects of component tolerances and ensuring consistent quality and long term reliability.

Low frequencies are reproduced by a 305 mm (12") bass driver with a low frequency extension to 35 Hz. The 130 mm (5") mid-range cone and 25 mm (1") HF driver are loaded into the proprietary Directivity Control Waveguide™.

The RAM4 amplifier unit contains an active crossover, the ideal method for dividing an input signal between the driver units, allowing the overall response of the system to be optimized to an extent impossible with a passive system. Variable input sensitivity as well as a balanced XLR line level input connector provide easy connection and accurate level matching to the preamplifier or surround decoder. The bass, midrange and treble amplifiers of the RAM4 produce 180 W for the low frequency driver and 120 W each for

the mid-range and HF drivers.

The amplifiers are designed to operate at very low THD and IM distortion values and are capable of driving the AOW312B to peak output levels in excess of 124 dB SPL at 2 m with music material.

Like all Genelec HT models, the AOW312B system incorporates special circuitry for driver overload and amplifier thermal protection, as well as an "Autostart" function for automatic switching between "Standby" and "On" power modes. A connector for 12 V trigger or external switch or relay type remote control facilitates central power mode switching.

The 3U RAM4 remote amplifier module is ready to be installed into a 19" equipment rack. Neutrik Speakon connectors are included to facilitate wiring and system connection. Signal cables are not provided with the system. See section "Connections" below for selecting signal cables.

Installation

Once unpacked, place the loudspeaker enclosure upright in its required position, taking note of the line of the acoustical axis (see Figure 2). Attach the mounting brackets

to the wall with suitable screws for carrying the loudspeaker's weight of 43 kgs (95 lbs). The maximum tilt angle for the loudspeaker enclosure is ± 5 degrees. Do not install the enclosure horizontally.

The mounting brackets are pre-drilled for enclosure alignment angles of -15° , 0° and $+15^\circ$. If necessary, you can drill new holes to the brackets for exact loudspeaker alignment. The rubber isolators provided must be placed between the brackets and loudspeaker enclosure.

It is recommended that the surroundings of the loudspeaker are covered with about 10 cms (4") of rockwool or similar damping material. If the loudspeaker is covered with a cloth, it must be acoustically transparent and a free space of at least 2 cm (3/4") left between the front baffle and the cloth. The reflex port of the loudspeaker enclosure is located on the left side of the enclosure (see Figure 2). The airflow from the port must not be obstructed, and a free space of at least 5 cm (2") is required before the port.

The RAM4 amplifier is shipped with a pair of rack ears to provide fitting into a 19" rack and a set of feet for placement on a shelf or table.

Sufficient cooling for the RAM4 amplifier must be ensured. The cooling fan on the amplifier back panel draws air through the filter on the left side panel and blows the warmed air to the space behind the amplifier. The airflow must not be obstructed. Note also that the space behind 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).

Connections

Each loudspeaker is delivered with two Speakon 8-pole cable connectors. There is one 8-pole Speakon output marked LOUDSPEAKER CONNECTOR on the amplifier and two inputs (one on each side) on the loudspeaker enclosure. Use only one of these inputs at any time. The inputs may not be used for daisy-chaining several loudspeakers or connecting two amplifiers to a single loudspeaker. The 4-pole Speakon output (LED CONNECTOR) on the amplifier is not used with the AOW312B.

Measure the required length of 8 pole cable and secure the connectors on it pin to pin. See Table 1 below for recommended cable

thicknesses. The whole cable should have an outside diameter of 8 to 20 mm (5/16" to 13/16") to fit in the Speakon connector.

Alternatively, pre-terminated lengths of cable are available from Genelec.

Be sure not to mix the amplifier/loudspeaker pairs when installing multiple loudspeakers at the same time. Each amplifier and loudspeaker packed together are calibrated together for optimal performance and marked with the same identification number.

Before connecting up, ensure that the mains switch is off. Check that the mains voltage selector on the amplifier back panel is correctly set to your local voltage. Audio input is made via a 10 kOhm balanced XLR connector, but unbalanced leads may be used as long as pin 3 is grounded to pin 1 of the XLR (see Figure 7). Once connection has been made, the loudspeakers are ready to be powered-up.

Access to the front panel controls

The decorative front panel of the RAM4 amplifier is held in place by guide pins and two magnets. To remove the panel, pull it straight out.

Setting the input sensitivity

Adjustment of the input sensitivity of each RAM4 amplifier can be made to match the output of the decoder or other source, by use of the input sensitivity control on the amplifier front panel. A small screwdriver is needed for the adjustment. The manufacturer default setting for this control is -6 dBu (fully clockwise) which gives an SPL of 100 dB @ 1m with a -6 dBu input level. To get the full output level from the AOW312B an input level of +10 dBu is needed at this setting.

Autostart and remote control

The RAM4 amplifier unit is equipped with an "Autostart" function, which automatically turns the amplifier to "standby" mode if an input signal has not been detected for approximately thirty minutes, and back to "on" mode when the signal returns. The function can be deactivated by turning the "AUTOSTART" dip switch on the back panel of the amplifier to "OFF".

The amplifier mode can also be switched by a remote control unit connected to the respective inputs on the amplifier back panel. 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 loudspeaker at the same time. Activate the function by turning the "REMOTE CONTROL" dip switch to "ON". Note that the remote control function overrides the "AUTOSTART" dip switch function.

Setting the tone controls

The acoustic response of the system should be adjusted to match the acoustic environment. The adjustment is done by setting the five tone control switch groups 'bass tilt', 'bass roll-off', 'bass level', 'mid level' and 'treble level' on the amplifier front panel. The manufacturer's default settings for these controls are 'All Off' to give a flat anechoic response. Figure 8 shows the effect of the controls on the anechoic response. Always start adjustment by setting all switches to the 'OFF' position. Then set only one switch per group to the 'ON' position to select the response curve required. If more than one switch is set to 'ON' (within one switch group) the attenuation value is no longer accurate.

Maintenance

The air filter on the left side of the RAM4 amplifier must be cleaned every six months. Remove the decorative front plate and pull the filter out. Check the filter and replace it with a new one if any damage or brittleness can be found. If the filter is in a good condition, carefully clean it with compressed air.

No other serviceable parts are to be found within the loudspeaker enclosure or the amplifier unit. Any maintenance or repair should only be undertaken by qualified service personnel.

Safety considerations

Although the AOW312B loudspeaker and RAM4 amplifier have been designed in accordance with international safety standards, to ensure safe operation and to maintain safe operating conditions, the following warnings and cautions must be observed:

1. Servicing and adjustment must only be performed by qualified service personnel. The amplifier must not be opened.
2. Do not use the amplifier with an unearthed mains cable or unearthed mains connection as this may lead to personal injury.

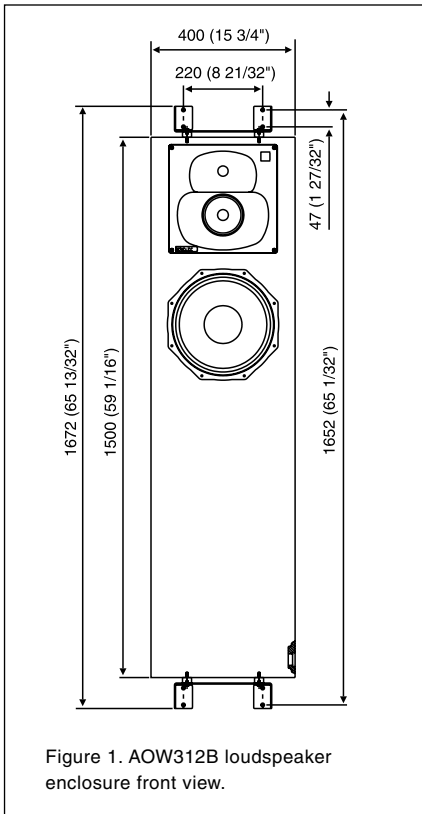


Figure 1. AOW312B loudspeaker enclosure front view.

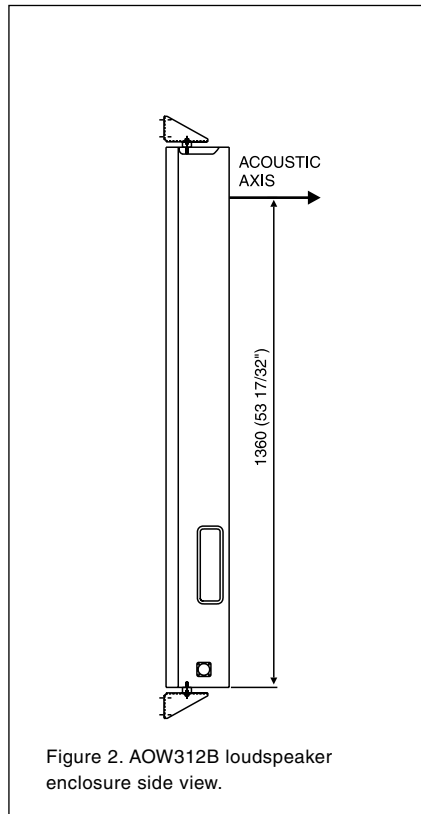


Figure 2. AOW312B loudspeaker enclosure side view.

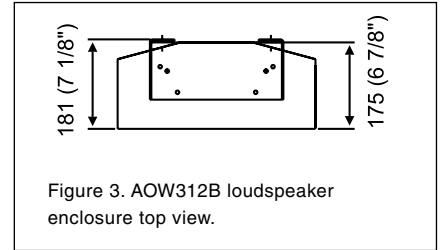


Figure 3. AOW312B loudspeaker enclosure top view.

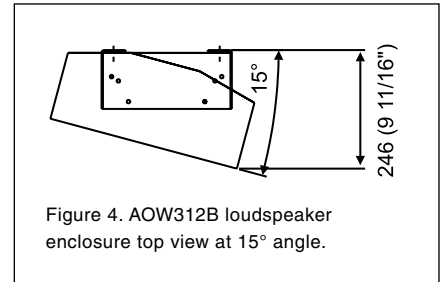


Figure 4. AOW312B loudspeaker enclosure top view at 15° angle.

Cable gauge	Max. length
2,0 mm ² (14 AWG)	30 m (100 ft)
3,3 mm ² (12 AWG)	40 m (130 ft)
5,3 mm ² (10 AWG)	60 m (200 ft)

Table 1. Recommended cable thicknesses for different lengths of cable

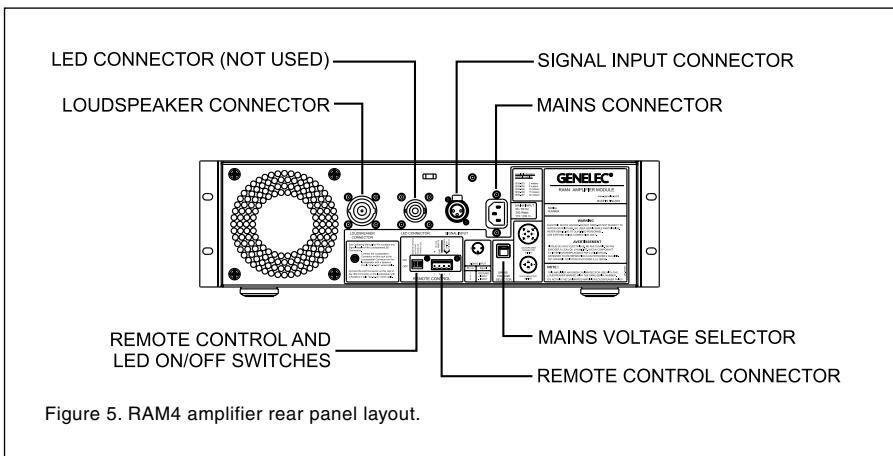


Figure 5. RAM4 amplifier rear panel layout.

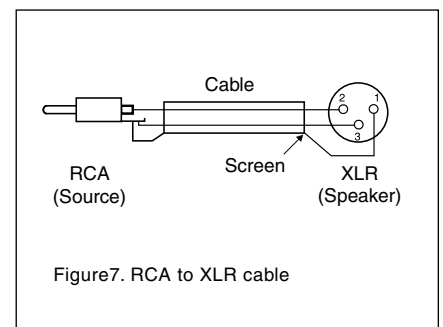


Figure 7. RCA to XLR cable

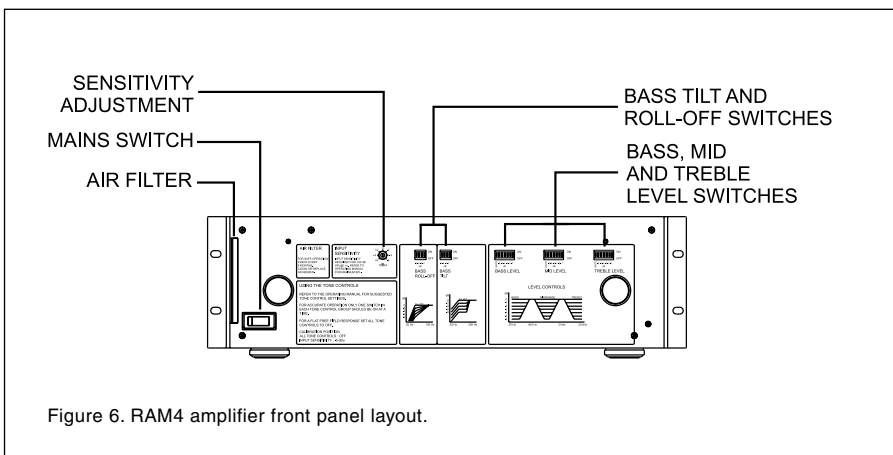


Figure 6. RAM4 amplifier front panel layout.

3. This loudspeaker is capable of producing sound pressure levels in excess of 85 dB, which may cause permanent hearing damage.
4. A free flow of air through the amplifier is necessary to maintain sufficient cooling. Do not obstruct airflow through the amplifier
5. To prevent fire or electric shock, do not expose the unit to water or moisture. Do not place any objects filled with liquid, such as vases on or near the loudspeaker or the amplifier.
6. Note that the amplifier is not completely disconnected from the AC mains service unless mains plug or appliance coupler of the amplifier is disconnected from the mains outlet. Ensure that the plug or appliance coupler of the amplifier is readily operable and easily accessible for doing this.

Guarantee

This product is supplied with a two year guarantee against manufacturing faults or defects that might alter its performance. Refer to supplier for full sales and guarantee terms.

EC Declaration of Conformity

This is to certify that the Genelec AOW312B Active On-Wall Loudspeaker conforms to the following standards:

Safety:
 EN / IEC 60065:1998 6th Edition
 EMC:
 EN 55020 : 2002 + A1 : 2003
 EN 55013: (2001)
 EN 61000-3-2 (2000)
 EN 61000-3-3 (1995)

The product herewith complies with the requirements of The Low Voltage Directive 73/23/EEC, EMC Directive 89/336/EEC and 93/68/EEC

Signed: 

Position: Ilpo Martikainen
 Chairman of the Board
 Date: 12-May-2008

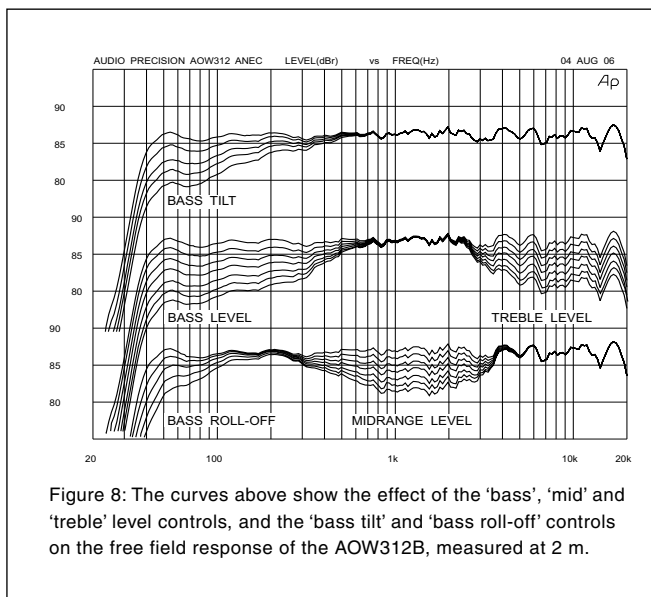


Figure 8: The curves above show the effect of the 'bass', 'mid' and 'treble' level controls, and the 'bass tilt' and 'bass roll-off' controls on the free field response of the AOW312B, measured at 2 m.

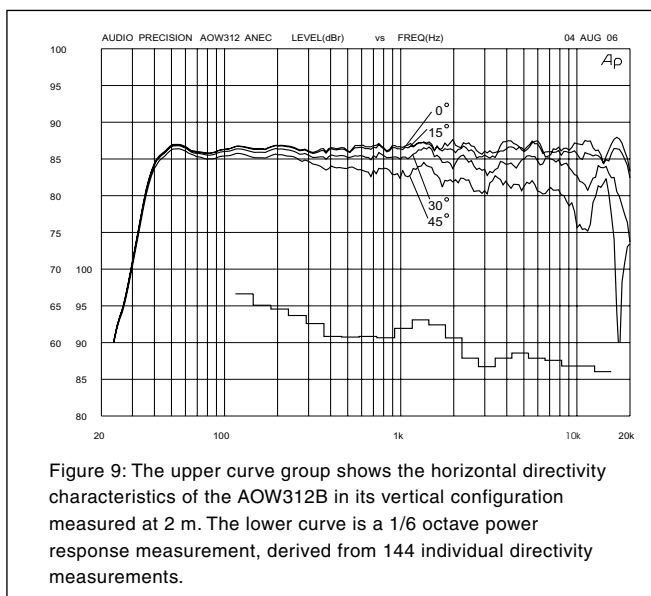


Figure 9: The upper curve group shows the horizontal directivity characteristics of the AOW312B in its vertical configuration measured at 2 m. The lower curve is a 1/6 octave power response measurement, derived from 144 individual directivity measurements.

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SYSTEM SPECIFICATIONS	
	AOW312B
Lower cut-off frequency, -3 dB Upper cut-off frequency, -3 dB Free field frequency response of system	≤35 Hz ≥22 kHz 37 Hz - 21 kHz (±2.5 dB)
Maximum short term sine wave acoustic output on axis in half space, averaged from 100 Hz to 3 kHz	@ 1 m ≥116 dB SPL
Maximum long term RMS acoustic output in same conditions with IEC-weighted noise (limited by driver unit protection circuit)	@ 1 m ≥107 dB SPL
Maximum peak acoustic output per pair in half space with music material	@ 2 m ≥123 dB
Self generated noise level in free field @ 2 m on axis	≤15 dB (A weighted)
Harmonic distortion at 95 dB SPL at 1 m on axis:	freq. ≤100 Hz <1% freq. >100 Hz <0.5%
Drivers Bass Midrange Treble	305 mm (12") cone 130 mm (5") cone 25 mm (1") metal dome
Weight Loudspeaker Amplifier	43 kg (95 lb) 12 kg (27 lb)
Loudspeaker dimensions Height Width Depth	1500 mm (59 1/16") 400 mm (15 3/4") 175 mm (6 7/8")
Amplifier dimensions Height Width Depth	133 mm (5 1/4") (3 U) 483 mm (19") 350 mm (13 4/5")*
	*Note that the cable connectors require additional >100 mm (4") space behind the amplifier

AMPLIFIER SECTION	
	AOW312B
Bass amplifier short term output power	180 W (4 Ohm load)
Midrange amplifier short term output power	120 W (8 Ohm load)
Treble amplifier short term output power	120 W (8 Ohm load)
Long term output power is limited by driver unit protection circuitry.	
Slew rate	80V/μs
Amplifier system distortion at nominal output THD SMPTE-IM CCIF-IM DIM 100	≤0.05% ≤0.05% ≤0.05% ≤0.05%
Signal to Noise ratio, referred to full output Bass Midrange Treble	≥100 dB ≥100 dB ≥100 dB
Mains voltage	100/200 V or 115/230 V
Voltage operating range	nominal ±10%
Power consumption Idle Full output	50 W 300 W

CROSSOVER SECTION	
	AOW312B
Input connector XLR female	pin 1 gnd pin 2 + pin 3 -
Input impedance	10 kOhm
Input level for 100 dB SPL output @ 1 m	variable from +6 to -6 dBu
Input level for maximum short term output	variable from +22 to +10 dBu for 116 dB SPL @ 1 m
Subsonic filter	18 dB/octave below 35 Hz
Ultrasonic filter	12 dB/octave above 25 kHz
Crossover frequency Bass/Mid Mid/Treble	420 Hz 3.2 kHz
Crossover acoustical slopes	18 - 24 dB/octave
Crossover level control operating range in 1 dB steps Bass Mid Treble	from 0 to -6 dB from 0 to -6 dB from 0 to -6 dB
Bass roll-off control in 2 dB steps	from 0 to -8 dB @ 35 Hz
Bass tilt control in 2 dB steps	from 0 to -8 dB @ 80 Hz
	The 'CAL' position is with all tone controls set to 'off' and input sensitivity control to maximum.

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