Installation Guide

Invisible Loudspeakers

THE INVISIBLE SPEAKER CO.

V0.6 August 2016

Index

Caution

WARNING:

No attempt should be made to install this product within existing building structures unless you are certain that no electric cables, water pipes, gas pipes or supporting joists will be cut through.

FIRE PROTECTION:

When making an intrusion into an internal wall or ceiling to install an Amina loudspeaker be sure to check the appropriate regulations pertaining to the required fire rating. Depending on the location of the intrusion and the applicable regulations it may be necessary to build in or install additional fire rated components or products to surround the speaker and back box. Amina Technologies take no responsibility for the correct specification and installation of any such fire protection system that is required behind their loudspeakers.

- To ensure optimal performance, please read this guide carefully and keep in a safe place for future reference.
- Install this product in a cool, dry, clean place - away from direct sunlight, cold bridges and heat sources, strong vibrational forces, chemical fumes, dust and moisture (steam).
- Do not expose this product to sudden temperature changes or locate it in an environment with high humidity. This is to prevent condensation forming inside which may cause damage to the product.
- Do not clean this product with chemical solvents as this may damage the finish. Use a clean, dry or damp cloth. Ensure that all installation mounting surfaces are able to support the weight of the product.
- After installation, avoid pushing on the wall or ceiling surface immediately in front of the speaker. Excessive excursion, whilst unlikely to damage the speaker, will undoubtedly crack the plaster around its perimeter.
- Do not attempt to modify or repair the product. Contact your distributor or Amina if a fault should occur.
- The rear of the product should not be subject to chemical cleaning and should not be painted in any way.
- When plastering over, ensure only 2mm of material covers the product. More than this will degrade the performance of the product and could lead to product failure.
- Avoid the use of silicone sealants within the area of the loudspeaker. Sublimation of silicone will deposit a thin layer of silicone material on the panel surface, severely degrading the ability of plaster to bond to its surface.

Environmental

- Before installing, ensure that the building is environmentally sealed, de-humidified and at a stable temperature of at least 16 degrees centigrade (61 degrees Fahrenheit)
- This product should not be used with single thick coat plaster solutions or with other finishing methods that take days (rather than hours) to dry out.
- Please be aware that when this product is directly fitted into a solid wall structure (e.g. when using the solid wall backbox) vibrational energy is inevitably transferred into the solid wall structure. This energy can travel for some considerable distance up, down and along the structure. It is therefore recommended the product be fitted within acoustically insulated stud walls or ceiling sections where possible. The use of the product directly embedded in solid walls is not recommended in multi occupancy buildings.
- Equally, using the product in simple (stud or rafter with plasterboard or floor board directly attached on both sides) stud walls & wooden rafter ceiling/floor structures will also transfer substantial sound energy to the other side of the wall or floor above. It is therefore recommended that the product be fitted in acoustically isolated stud walls or ceiling sections where possible.
- Completed and fully dried plaster surfaces should be finished with permeable coatings / materials to allow moisture in that coating or the adhesives used to apply those materials, to dry into the environment quickly.

Message from the Managing Director

Congratulations and thank you for purchasing an Amina Technologies high performance invisible loudspeaker.

At Amina we are proud of being at the forefront of flat panel loudspeaker technology. All the components that make up your loudspeaker have been developed specifically to provide the ultimate in sound quality and reliability, whilst allowing you to decorate, furnish and enjoy your home in any way you wish without any visible 'clutter' from your audio system.

At the heart of an Amina loudspeaker is our high performance vibrational panel driver, featuring a unique high power neodymium magnet motor system. This enables the product to provide high quality, high loudness levels from such a compact design. Please take a moment to read this guide which will help you achieve the best possible performance from your product.

Thank you and enjoy listening.

Richard Newlove

MD - Amina Technologies Ltd

About the Manufacturer

Amina Technologies Ltd is the world's leading designer and manufacturer of truly invisible loudspeaker solutions. Our invisible loudspeakers have been used in a wide range of both commercial and residential applications for over fifteen years.

Luxurious hotels & spas, exclusive retail outlets and stunning private residences have all benefitted from using Amina invisible loudspeakers, not only for its' incredible aesthetic quality, but for its' absolute ability to reproduce sensationally clear audio across any space. Amina has created the very best discrete audio solution for architects, interior designers and all design conscious clients.

See our website for more details about Amina and a selection of prestigious projects completed using our products.

Introduction

Thank you for purchasing Amina invisible loudspeakers. Properly installed, these loudspeakers will provide high quality, invisible sound for many years, even decades, to come.

Installation options

Installation is simple, but should only be attempted by professional building trades with plastering experience and who have ideally completed an Amina installation training course.

Amina loudspeakers can not be mounted into a wall without the correct fixing accessories, supplied by Amina for each wall type.

Please read the instructions carefully, particularly the Installation section which contains important advice to select the correct wall-mounting accessories.

This manual should then be read in conjunction with the associated manual supplied with your mounting accessory.

Unpacking

Unpack the unit.

Check that your carton contains the correct number of items - a single speaker, or two if ordered as a pair.

Retain this Installation Guide. If you pass the unit on to a third party make sure you pass on the Installation Guide.

Retain the packaging. If you dispose of it, do so having regard to any recycling regulations in your area.

Packaging

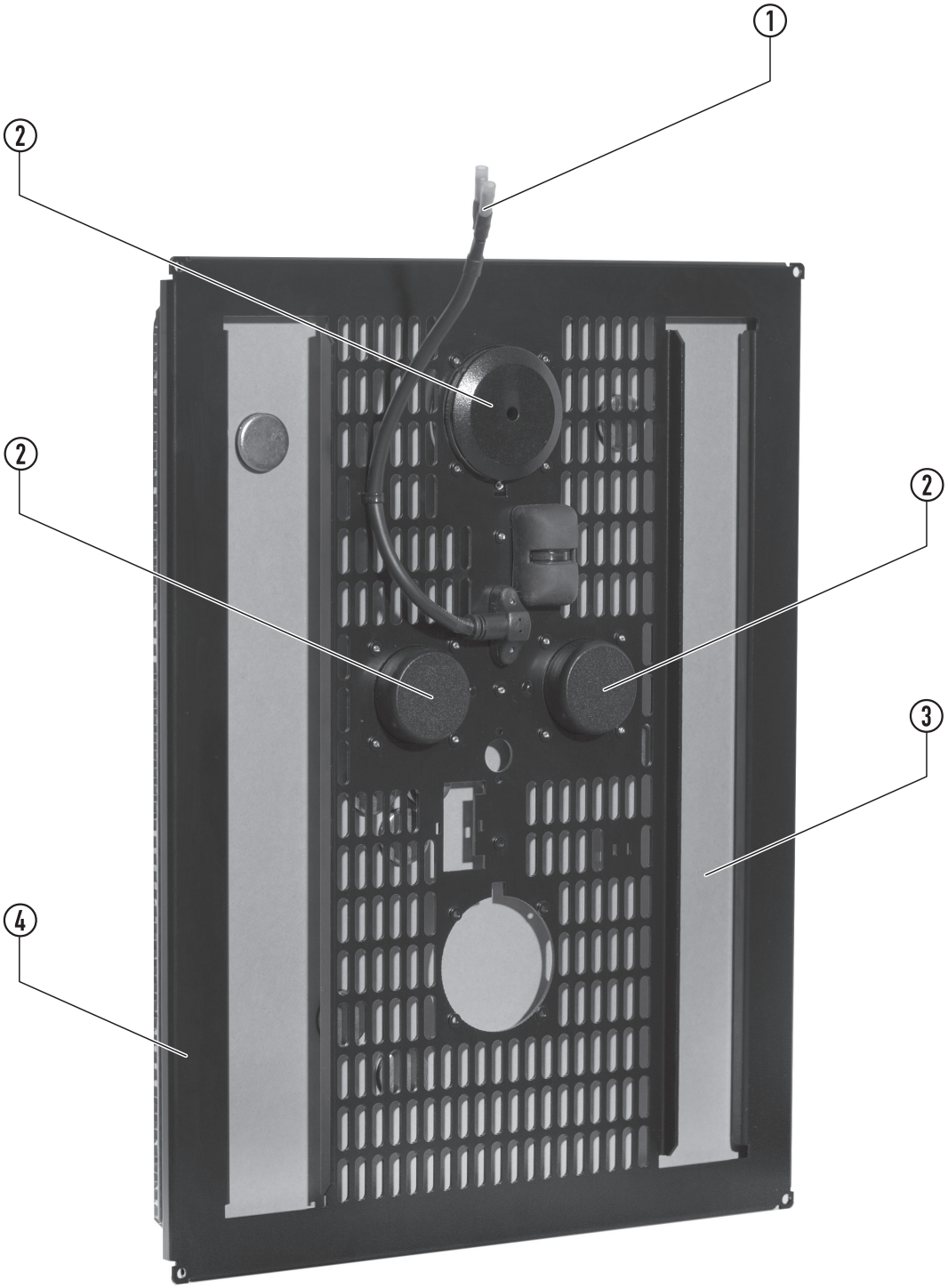
CAUTION:

Take care when removing the loudspeakers from the carton.

The packaging for the Amina loudspeakers has been carefully designed to protect the product during transit. Please retain it in the unlikely event you need to return the product to your dealer or to Amina. Please recycle the packaging should you wish to dispose of it.

The outer carton is made up of 80% recycled single wall board.

Overview



1. Electrical connection (to an amplifier)
2. High power neodymium magnet structures
3. Active panel surface
4. Aluminium chassis

The Overview image shows a Mobius7 loudspeaker with triple magnet structures. Other models may feature different numbers of magnet structures and electrical connectors.

Installation

IMPORTANT: Read this section carefully before attempting to install an Amina speaker.

To avoid any possible damage to Amina invisible loudspeakers they must be mounted and connected using the correct accessories, supplied by Amina. The tables to follow list these accessories.

Mounting accessories

Identify the construction type of the wall/ceiling where the loudspeakers are to be installed and ensure you have the correct fixing accessories to hand before installing your loudspeakers.

Full installation instructions are included with each type of mounting accessory.

Type	Application	Image
BackboxCV300 **BackboxCV345** **BackboxCV200** For cavity walls and celings	Used to install loudspeakers in cavity walls and ceilings to reduce airborne sound generation from the rear of the speaker and create optimum acoustic cavity.	
Firehood 300 **Firehood 345** **Firehood 200** For fire-rated cavity walls	A 60 minute fire rated overjacket to use with the BackboxCV, which maintains 1 hour fire-retardency, where necessary, and additionally reduces airborne sound generation from the rear of the speaker.	
Basic fixing block kit For cavity walls	Used to install loudspeakers in cavity walls and ceilings, when BackboxCV cannot be used.	
BackboxSW300 **BackboxSW345** **BackboxSW200** For solid walls	A stainless steel backbox to build into solid walls prior to speaker installation.	
Shims	Various thicknesses available to align the speaker with the front of non-standard plasterboard structures.	

Refer to the Installation guide supplied with the above mounting accessories for detailed fitting instructions of the accessory together with how the loudspeaker is used within it.

Installation

Speaker protectors

Amina APU series speaker protectors are specifically designed to work with Amina invisible loudspeakers. They provide essential safe operating functions and include protection elements that constantly monitor the power fed to the speaker keeping it within safe limits should the need arise.

An Amina speaker protector should be wired in-line with each Amina speaker, preferably in an accessible place, allowing this device to be replaced as necessary.

There are four types of protector.

Type	Application	Image
APU2	Compact two channel crossover and protection unit.	
APU-RS8i	Flexible 8 channel crossover and protection unit in a 1U case for optional rack mounting. Provides protection for installations of up to 8 Amina loudspeakers of any type.	
APU-RS16i	16 channel crossover and protection unit in a single 1U case. Provides protection for up to 16 Amina loudspeakers.	
APUi	Single channel crossover and protection for wiring in-line with each Amina speaker. APUi crossovers are available in different versions and must be ordered to match the speaker being installed.	

Setup tips

APU protection

Amina loudspeakers must be used with an APU protection device or another protection device, approved by Amina. Please refer to the instructions supplied with the APU devices and full warranty information for further details.

Installation Backboxes

Amina loudspeakers have been designed for optimum sound quality when installed with the Amina BackboxCV. We recommend that they are used wherever possible in a cavity type installation. If our basic fixing block kit is used you may find that the low/mid frequencies are reproduced less accurately, but any effect will be very much installation specific.

When installed into solid walls or ceilings using the Amina BackboxSW, you may find that your speaker reproduces slightly less low frequency output compared to a BackboxCV installation. Also, depending on the building construction, there may be significant mechanical sound transmission into adjacent rooms/properties (see page 2).

Wall or Ceiling Placement

Amina loudspeakers are suitable for both wall and ceiling installations. When the most uniform audio coverage in a room is required, space the loudspeakers evenly in the ceiling. However, if the room has a height greater than 6m (19'), Amina suggests installing them in the walls at a height of around 1.8m (6').

In dedicated listening rooms where loudspeakers are used in stereo or multi channel systems, position them in the walls so that the centre point of the speaker is approximately 1 – 1.8m (3.5 - 6') from the floor. This will give excellent results, but don't worry, if this is not possible to achieve in your room, the audio characteristics of Amina loudspeakers make exact positioning according to stereo 5.1 and 7.1 conventions far less critical.

Audio Characteristics

Amina loudspeakers generate sound in a similar way to an acoustic musical instrument. The speaker's front face is effectively the "musical" soundboard and the sound waves generated from it are diffuse and are dispersed over a very wide angle. This means that loudspeaker positioning is far less critical than with conventional loudspeakers. Additionally, just like the acoustic musical instrument, Amina loudspeakers have excellent room filling abilities.

Amina loudspeakers are planar devices and this feature is further enhanced when flush mounted into your wall or ceiling. Being planar (or flat) means that the audio's arrival time to the listener is the same for all frequencies, i.e. there is very little phase distortion. Therefore Amina loudspeakers (and other planar devices such as electrostatic loudspeakers) can reproduce subtle nuances on a recording with incredible accuracy.

In addition to the above characteristics, the radiating surface of an Amina speaker is very stiff and undergoes very small amounts of movement in order to generate high sound pressure levels. This means that the loudspeakers are inherently "fast" making them highly articulate loudspeakers.

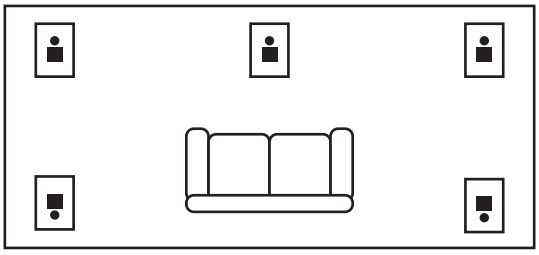
Setup tips

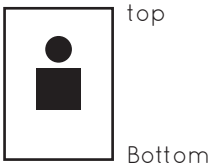
Speaker Orientation

Amina loudspeakers can be installed either in portrait or landscape orientations. Typically the spacing between wall joists will dictate portrait orientation and Amina have optimised the dispersion characteristics for this setup. Therefore when installing into walls Amina suggest portrait orientation for best sound quality.

For non-critical listening in ceiling installations the orientation of the speaker is not crucial.

For critical listening in ceilings, e.g. a 5.1 surround system, ensure that the orientation of all loudspeakers are the same relative to the main listening position and position the top of the speaker closer to the wall boundary.





Boundary Loading

It is possible to increase the low frequency output of Amina loudspeakers by positioning them close (50mm - 150mm) to the corners of a room. This can be useful when no additional bass enhancement unit (e.g.. ALF40) or subwoofer (e.g. ALF80 or ALF120) is used.

System Requirements

From a system compatibility point of view your speaker (and it's accompanying APU protection unit) can be treated like any conventional low impedance (4-8 ohm) loudspeaker. Amina recommends you use a good quality amplifier so as to avoid driving them with high levels of distortion, which at best, will provide poor sound quality and at worst may permanently damage the loudspeaker. Amina also recommend you connect your loudspeakers to your amplifier with at least 16AWG OFC (oxygen free) cable (14AWG for long runs) to avoid any chance of reduced efficiency and restricted audio bandwidth.

For 2.1, 5.1 and 7.1 systems always use the amplifier's crossover settings to divert frequencies below 100Hz to your subwoofer. This will improve the dynamic range and power handling of the system. (APU devices should still be used).

IMPORTANT: Amina loudspeakers are highly revealing of any shortcomings in the source or amplifier. Please be aware that some low cost zone amplifiers will produce high amounts of distortion well within their operating range and this will be ruthlessly revealed by Amina loudspeakers.

Sound Transmission

As with any speaker designed to be fixed to a structure within a wall or ceiling, careful consideration should be given to sound transmission into adjacent rooms or properties. We recommend specialist advice is taken if sound transmission into adjacent rooms needs to be minimised. Please talk to the Amina technical team for advice on reducing sound transmission as a starting point.

100/70V Option

For multi-speaker commercial installations, please contact Amina for their range of loudspeakers supplied with 100V or 70V line transformers fitted.

Maintenance and cleaning

Once your speaker is plastered into your wall or ceiling, it requires no physical maintenance. Your wall or ceiling can be cleaned with products appropriate to the finish finally applied to the plaster surface.

The wall or ceiling can be painted or redecorated any number of times. Extreme care should be taken when removing wallpaper type coverings to ensure the plaster surface is not damaged. If damage to the plaster work occurs, use repair plaster to restore the plaster surface prior to re-decorating. Amina Technologies Ltd recommends British Gypsum Easi-fill® repair plaster.

Avoid pushing the wall or ceiling surface immediately in front of the speaker. Excessive excursion, whilst unlikely to damage the speaker, will undoubtedly cause the plaster to crack around its perimeter.

Removal

In the unlikely event of a problem developing with the product, or you simply wish to remove the item to change its location, please refer to the following guidelines:

Locate the speaker by tapping the wall or ceiling listening for a hollow sound compared to the rest of the wall/ceiling. Then, with a sharp chisel or decorator's scraper, carefully chip into the plaster along the edge of the speaker to expose a small area of the panel surface. To ensure you do not damage the panel, hold the tool at an acute angle to the wall or ceiling.

Now, holding the scraper almost parallel to the panel surface, work outwards towards the products' corners easing the plaster away from the panel (during this process, attempt to remove as little plaster as possible). Do not worry if the panel surface receives marks or indented scratches during this process (it should not, however, have holes entering through to the unique honeycomb panel). Once the product is plastered back into its original or new location, the new skim of plaster will cover all these imperfections and the loudspeakers performance will not be unduly affected.

Clear the surface plaster material from the surrounding plasterboard to expose all the joint tape and subsequently remove it. Use a narrow chisel or flat blade screwdriver to remove the plaster and expose the screws at each corner of the product. Using a suitable screwdriver, remove the four screws and then ease the product from the wall or ceiling and disconnect the speaker cable. Leave all four fixing blocks or the BackBox in place as these can be used to support a small section of plasterboard when making good the wall/ceiling.

If the product needs repairing, please return it to your supplier or Amina Technologies Ltd again leaving as much plaster on the panel surface as possible. Once repaired, the product can be refixed into position following appropriate installation steps detailed earlier within the manual.

For further details, please call Amina Technical Support on +44 (0)1480 354390.

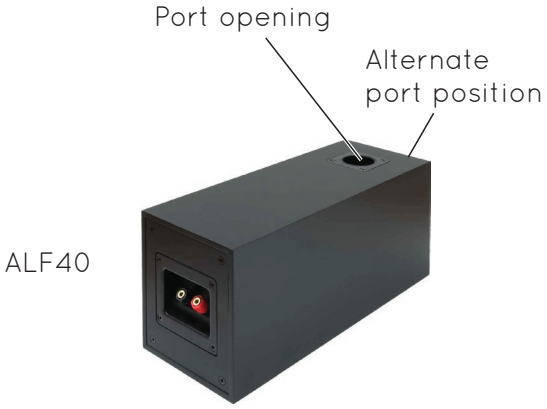
Accessories

Subwoofers

ALF40

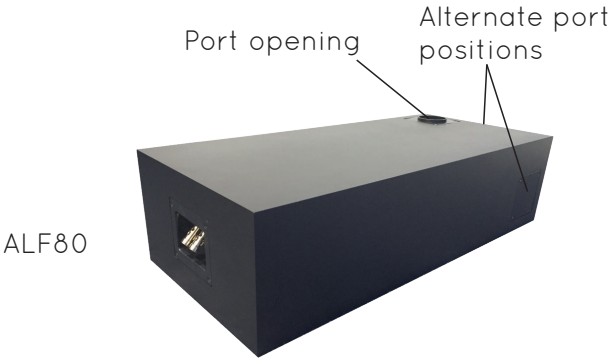
40W compact, passive bass enhancer with unique adjustable port design allowing the product to be installed within joinery, behind kick boards or within ceilings or other voids.

Highly discreet, high quality bass enhancement is achieved with only a small opening for the port required within the room.



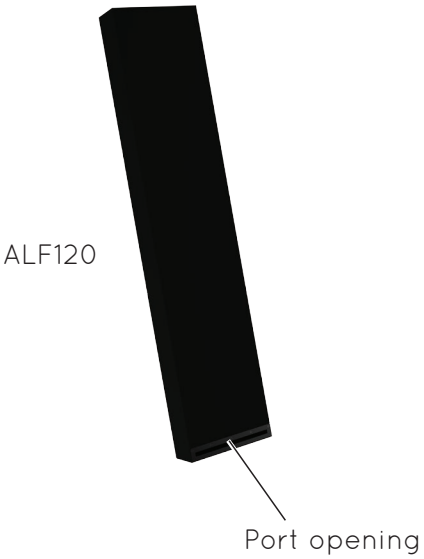
ALF80

150W passive subwoofer with unique adjustable port design allowing the product to be installed within joinery, behind kick boards or within ceilings or other voids. Highly discreet, powerful and deep bass response is achieved with only a small opening for the port required within the room.



ALF120

Amina have developed an astonishing subwoofer technology dubbed ‘distributed transmission line’ (DTL), which allows the design of a subwooder thin enough to be built into a stud wall, venting through a simple slot in the skirting board, to create an impressively low 27Hz audio output at 111dB loudness using only 50W of power.



Troubleshooting

Thorough testing of the loudspeakers should be carried out both prior to and after plastering to avoid time consuming repairs or modifications at a later stage. Should you encounter any problems at either of the test stages the following guide is designed to help determine possible problem areas.

Advice for testing

- When testing always use a basic sound system (amp, source, loudspeakers) to eliminate the possibility of faults with other, more sophisticated components, such as control systems.
- Test at low and medium volumes and be careful not to exceed the specific speaker model's recommended power. Using tone sweeps or music as test material, listen for distortion, buzzing or rattles at appropriate levels. Using test discs or music, confirm that all channels are in-phase.
- Ideally professional test equipment should be used to record a full frequency response of the loudspeaker before and after plastering.

No or low sound output

- Check continuity of all cables.
- Check that all cables and connections are made correctly, are intact and that all channels are correctly phased (+ to + and - to - from amp to speaker).
- Using an impedance meter, check the nominal impedance of the speaker (APU must not be connected) both at the terminals and the amp end of the cable. Do these measurements match each other? (Allowing for the small impedance increase of less than 1 ohm along the wire length) Do they match the stated nominal impedance on the loudspeakers specification label? If the nominal impedance does not match the product's stated impedance, a speaker driver may be open circuited or short circuited. If so, the product may need to be returned to Amina for repair or replacement.
- If the nominal impedance at the end of the cable is very different to the impedance at the speaker, check your cables. Cuts or nicks in the cable along its length can dramatically increase impedance or create a short circuit, dramatically lowering the impedance.

Troubleshooting

Distortion, buzzing or rattles at modest volumes

- Try to identify the location of the buzz or rattle. It may be caused by a loose screw or other mechanical object. Check the wall or ceiling and speaker assembly and ensure screws and fixings are tight.
- If the rattle persists, remove the speaker from the wall and check your wiring to the product. Ensure that wires, with the speaker in the final location, are not resting against the speaker or backbox (if used), causing vibrations.
- With no audio signal applied, lightly push the speaker face in and out at its centre. Listen carefully for rubbing on the driver, which may sound like scratching. This may indicate the speaker has been over driven and subsequently damaged. The speaker will need to be sent to Amina for repair or replacement.

Very low output after speaker passes electrical tests

- With no audio signal applied, lightly push the panel in and out at its center. Listen carefully for rubbing voice coils on the driver, which may sound like scratching. This may indicate the speaker has been over driven and subsequently damaged. The speaker will need to be sent to Amina for repair.

Distortion at higher volume levels

- Diffuse source panel loudspeakers of this type have an extremely fast response, articulating the signal from your audio system very accurately. Take your system back to the bare minimum (amplifier, source and loudspeakers) to eliminate distortions introduced by other components.
- When using your amplifier at maximum power levels, or if the input of your amplifier is being overloaded, the signal level may be ‘clipping’. With some conventional loudspeakers this may not be evident, but with a diffuse source panel speaker you are much more likely to hear the distortion. Consider adjusting or upgrading your system.

Specifications

Mobius series - Plaster over products

Model number	Mobius7
Dimensions	450mm x 345mm x 33mm (17¾" x 13⅝" x 1⁵/₁₆")
Weight	1.78kg (3lbs 15oz)
Nominal impedance	4Ω
Frequency response	55Hz - 30kHz
Sensitivity (@1m/2.83Vrms)	87dB
In-line protection unit (single channel)	APUi70
In-line protection unit (multi-channel)	APU-RS8i/ APU-RS16i
Fixing options	Amina BackboxCV345 / BackboxSW345 / Basic fixing kit / Firehood345
Power handling (continuous)	75W
Power handling (peak)	150W
Operating temperature range	16°C - 40°C
Manufacturer limited warranty	10 years (residential systems), 5 years (commercial systems)

Evolution series - Plaster over products

Model number	AIW350iN	AIW450iN	AIW550iN	AIW350iN-S200
Dimensions	450mm x 345mm x 40mm (17¾" x 13⅝" x 1⅝")			450mm x 200mm x 40mm (17¾" x 7⅞" x 1⅝")
Weight	1.39kg (3lbs 1oz)	2.10kg (4lbs 10oz)	1.58kg (3lbs 8oz)	1.1kg (2lbs 7oz)
Nominal impedance	8Ω	2 x 8Ω	4Ω	8Ω
Frequency response	105Hz - 20kHz			
Sensitivity (@1m/2.83Vrms)	84dB	87dB		84dB
In-line protection unit (single channel)	APUi30	APUi30 x 2	APUi50	APUi30
In-line protection unit (multi-channel)	APU-RS8i / APU-RS16i			APU-RS8i / APU-RS16i
Fixing options	Amina BackboxCV345 / BackboxSW345 / Basic fixing kit / Firehood345			BackboxCV200 / BackboxSW200/ Basic fixing kit / Firehood200
Power handling (continuous)	30W	2 x 30W	50W	30W
Power handling (peak)	60W	2 x 60W	100W	60W
Operating temperature range	16°C - 40°C			
Manufacturer limited warranty	10 years (residential systems), 5 years (commercial systems)			

Specifications

iQ series - Plaster over products

Model number	iQ1	iQ2	iQ3
Dimensions	400mm x 300mm x 40mm (15¾" x 11⅞" x 1⅝")		
Weight	0.83kg (1lb 13oz)	1.08kg (2lbs 6oz)	0.92kg (2lbs)
Nominal impedance	8Ω	2 x 8Ω	8Ω
Frequency response	112Hz - 20kHz		
Sensitivity (@1m/2.83Vrms)	83dB	86dB	84dB
In-line protection unit (single channel)	APUi10	APUi10 x 2	APUi30
In-line protection unit (multi-channel)	APU-RS8i/ APU-RS16i		
Fixing options	Amina BackboxCV300 / BackboxSW300 / Basic fixing kit / Firehood300		
Power handling (continuous)	15W	2 x 15W	30W
Power handling (peak)	30W	2 x 30W	60W
Operating temperature range	16°C - 40°C		
Manufacturer limited warranty	10 years (residential systems), 5 years (commercial systems)		

LFiMT - Plaster over 100/70V products

Model number	LFi2eMT	LFi4eMT
Dimensions	400mm x 300mm x 40mm (153/4" x 114/5" x 13/5")	
Weight	2.56lb (1.16kg)	2.78kg (1.26lb)
Available input tappings	100V Line: 5W, 10W, 15W, 20W 70V Line: 2.5W, 5W, 7.5W, 10W	
Frequency response	110Hz - 20KHz	
Sensitivity (@1m/2.83Vrms)	84dB	85dB
Required system filter	24dB/octave high pass filter at 80Hz or higher	
Fixing options	Amina BackboxCV300 / BackboxSW300 / Basic fixing kit / Firehood300	
Electrical connection	Professional insulated butt-splice, accepts <2.6mm (14AWG) conductor diameters.	
Transformer type	High quality multi-tapped toroidal	
Operating temperature range	16°C - 40°C	
Manufacturer limited warranty	5 years (commercial systems)	

Warranty information

Limited Warranty:

Amina loudspeakers are designed to operate reliably for many years. Correctly installed in accordance with these instructions, Amina warranties the loudspeakers against defective materials and workmanship for a period of ten years in residential and five years in commercial applications.

At the end of the speaker's useful life and in compliance with the European directive on waste electrical and electronic equipment (WEEE), this product is to be returned to your supplier, or directly to Amina for recycling. If you have any questions please contact Amina Technologies Ltd.

* Please refer to our full warranty statement for details, available **on our website, or alternatively contact us via email.**

Important Note: This product does not comply to European Construction Products Directive EN 54-24 and therefore must not be used in voice evacuation systems located within the European Union.

Copyright information

Contact information

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