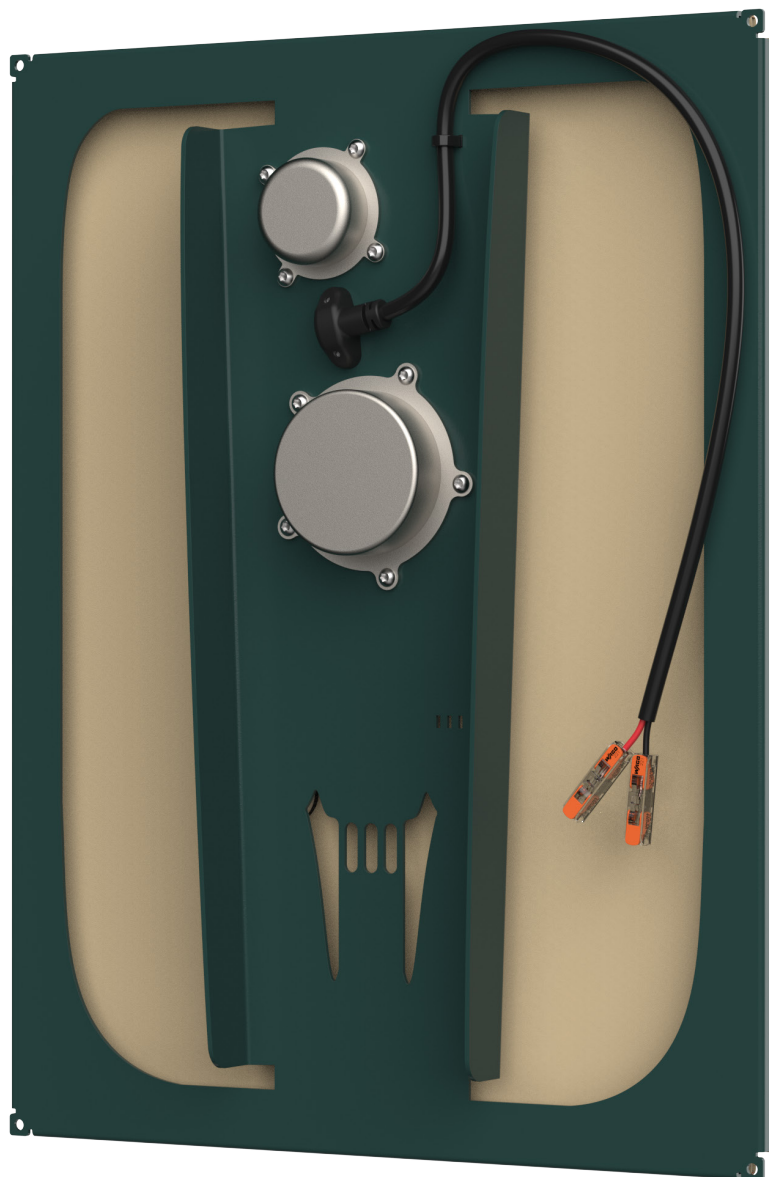

Installation Manual & User Guide

Sapphire250 Sapphire375



Compatibility

This installation guide covers installation of the Amina Sapphire Invisible loudspeakers into cavity walls and ceilings, finished with a full plaster skim.

Other installation guides are available to download at www.aminasound.com for walls built with different construction methods.

Always choose the installation guide that matches the speaker and wall type for your installation.



AMINA

IMMERSIVE INVISIBLE SOUND

Amina Sapphire Fully Concealed Loudspeakers

The Amina Sapphire series of Loudspeakers is designed to deliver best in class audio performance in fully concealed in-wall and in-ceiling applications, preserving the interior aesthetic of any space.

Wall Construction

This installation guide contains detailed instructions required to install your Amina Sapphire Invisible Loudspeaker into a new cavity wall constructed from plasterboard using a BackboxCV housing. The wall is finished with a full plaster skim coat.

Refer to www.aminasound.com to download installation guides for installation of the Sapphire speaker into other wall types or contact the Amina support team for further advice.

What's in the box

The following items are included with each Amina Sapphire loudspeaker -

- 1 x Amina Sapphire loudspeaker
- 1 x Quick reference installation guide with installation template
- 2 x Lever splice connectors
- 4 x Fixing screws

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Caution: Read before installing this product



CAUTION:

The installation guide included with a BackboxCV describes the different installation steps required for other models of Amina Invisible loudspeakers. Refer only to the Installation steps in this guide when installing a Sapphire loudspeaker.



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 or damaged.



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 enclose 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.



SPEAKER PROTECTION:

Amina loudspeakers must be installed with an electrical overload protection device, supplied or approved by Amina. These devices help ensure the loudspeaker operates reliably for many, many years ahead, by limiting and protecting against temporary excessive audio signals that could damage the product.

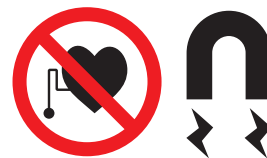
Common sense should always prevail though. Your product should never be operated at repeated or consistently excessive audio levels. Never operate your Amina loudspeakers at a level where audio reproduction sounds distorted.

For the ultimate in protection, Amina recommend using the Amina A100Q digital amplifier to drive your loudspeakers. It prevents unwanted and excessive electrical energy from reaching the speaker whilst allowing it to perform at its very best at all times.

Amina also recommends other digital amplifier products from industry brands. Please contact Amina support for further information.



MAGNETIC FIELDS:



This speaker contains powerful neodymium magnet structures. High magnetic fields can be harmful to wearers of pacemakers and other similar implant devices.

Implant device wearers should keep at least 30cm (12") from the speaker during installation or use.

Installers must advise this caution when handing over a new installation.

Caution: Read before installing this product

- 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 and any mounting accessories.
- After installation, avoid pushing on the wall or ceiling surface immediately in front of the speaker. Excessive excursion can crack the plaster around its perimeter and can damage the loudspeaker.
- Do not attempt to modify or repair the product. Contact your distributor or Amina if a fault should occur.
- 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.
- Prior to plastering, wipe the front panel surface clean with a damp cloth.
- The rear of the product should not be subject to chemical cleaning and should not be painted in any way.

High-tack panel surface



The front panel surface of the speaker is coated with a high-tack primer which enhances the adhesion of plaster to the speaker front panel.

This surface is tacky to the touch, but is safe to handle and will not leave a residue on the skin.



Never apply any other, additional priming products, such as PVA etc, to the high-tack front panel surface.

The panel surface is already optimised for plaster adhesion as supplied.

NOTE: If required, the front panel surface may be wiped clean at any time with water or mild, water-based cleaners. Never use any chemical or spirit based cleaner or abrasives to clean this surface.

Metal Frame Ceilings

Timber based infrastructures are naturally heavy, solid and acoustically low energy or energy absorbing type structures, simply because of the characteristics of wood. In contrast, Metal Frame (MF) structures are substantially lighter and tend to be acoustically active (or 'ring') when excited by large amounts of mechanical (vibrational) energy.



When installing Amina products in MF ceilings we recommend the following actions be taken during ceiling construction. These are especially important where habitable spaces exist above such ceiling structures:

Secure mechanical fixing

All metal intersections in the MF ceiling structure should be fully mechanically fastened (i.e. screwed) together. The use of spring clamps or clip systems at intersections should be avoided. Metal parts that are not fully secure can resonate against each other when vibrational energy is applied to the ceiling.

Clean thoroughly

Ensure the top side of the new ceiling is fully cleaned of debris and all cables are tied neatly and don't rest directly on the back of the ceiling or the speaker backbox. This will avoid unwanted rattles and buzzes.

Avoid cut ends

Try to avoid cutting into or cutting sections of the metal frame ceiling out altogether. If this is not possible, make sure cut ends themselves are not split and twisted upon each other as that could cause metal to metal resonances. We would recommend daubing any cut ends with a compliant type of construction mastic such as CT1/OB1.

Fixings near speakers

Use extra screws to secure the plasterboard in place to rafters, studs and rails around the perimeter of each speaker. This prevents plasterboard in that higher vibrational energy location from 'slapping' on the structural parts.

Framing the speaker fixing area

Consider lining the section immediately around the speaker with 2"x3" or similar timber framework. This helps stabilise the area around the speaker to create a long-term robust install.

Reduce resonance

An MF ceiling buildup of a single layer of plasterboard applied to the MF frame has limited stability allowing resonant notes to occur across the ceiling in general. A layer of OSB, ply, plasterboard, cement board or rubber backed high density gypsum board applied to the whole ceiling prior to the final plasterboard layer stabilises the full ceiling, creating an excellent structure to locate Amina products and generally reduce room generated sound transmission to other floors.

Minimise sound transmission

Airborne sound energy converts itself to mechanical impact energy when it reaches a solid surface. To minimise disturbance to floors above, consider building an additional sealed, solid containment (i.e. plasterboard and ply or double layer plasterboard) structure above but spaced off from the Amina backbox and from the floor above.

Absorption damping in the void

Ensure the whole of the cavity void between MF ceiling and floor above is filled with high density acoustic insulation material. (Rockwool etc. Recycled cotton, which by its very nature, has very high acoustic absorption properties as well as excellent thermal insulation properties, is a great option here).

Damping the MF channels

Consider applying Amina's 4mm thick, 50mm wide, energy absorbing 'HushMount'TM Tape within the MF steel channel or to the underside of the channel before boarding commences. This will adsorb mechanical impact energy from the structure of the ceiling.

Metal Frame Ceilings

Damping near speakers

Consider applying Amina's 4mm thick, 50mm wide, energy absorbing HushMount™ Tape to the back of the plasterboard or ceiling build up surrounding the speaker location. This will help absorb unwanted mechanical impact energy generated by the loudspeaker. Additionally or alternatively, consider bonding (using a flexible construction mastic such as CT1/OB1) one or more layers of plasterboard to the back of the plasterboard immediately around the location of the back of the speaker.

Sealing the floor

Ensure the floor structure above the ceiling is completely sealed (i.e. no holes or gaps) to maximise reduction in airborne sound transmission to any habitable spaces above that floor.

Spring clamps or simple spring intersections

If your MF structure does use non-screwed intersections between rail and top hat sections, firstly add a screw fixing at each intersection if possible. If not, consider applying expanding polyurethane foam into each joint section to ensure it is rattle free.

Sound in your home

Amina products are widely applied in whole house audio systems and multichannel home cinemas to create the very best entertainment source while not impinging on the design of your home.

Never imagine though that sound reproduction is isolated to one room only and will not be heard elsewhere in the home. Sound from any audio source (a person talking, a conventional speaker, a TV or an Amina invisible speaker) will transfer in air through open doors, ventilation structures, gaps under doors etc, to other areas of the house. Sound will also pass mechanically through the structure of the building (a good example is the central heating boiler. Most homeowners know exactly when it is on!) to other areas quite some distance away.

Whole house/multi-room audio systems are designed to give you the very best audio experience in the space/room you might occupy at any one moment. This does not mean to say that occupiers of other rooms will not hear some of that sound at the same time. They are more than likely to experience it in some lesser level and lesser quality than the intended room.

Please remember therefore that it is not always possible to enjoy the full capabilities of your audio system when other members of the household want to remain undisturbed.

Sound in your work or leisure environment

Amina products are widely applied in prestigious retail, hotel, restaurant, office, spa and other leisure and work facilities.

The Amina Active Sound Board technology creates an incredibly even level of sound across an entire space.

This creates an entertaining yet naturally comfortable sound field for users and occupiers.

At the same time the physical embodiment of the speaker is totally unobtrusive, allowing interior designers complete freedom from technology.

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 Active Sound Board loudspeaker technology. All the components that make up your loudspeaker have been developed specifically to provide the ultimate in sound quality and reliability, while allowing you to decorate, furnish and enjoy your space 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 flat panel loudspeakers have been used in a wide range of both commercial and residential applications for over twenty five 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 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 Sapphire loudspeakers. Properly installed, these loudspeakers will provide high quality, invisibly reproduced 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 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

Check that your carton contains the correct number of items and accessories.

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

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, having regard to any recycling regulations in your area.

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

Compatibility

This installation guide covers installation of -

Amina Sapphire250 and Sapphire375 Invisible loudspeakers within a BackboxCV into new cavity walls that will be fully skimmed.

The BackboxCV345 345mm back box matches both speaker types.

Other installation guides are available at www.aminasound.com for installing Sapphire series loudspeakers into walls built with other construction methods or for different finishing methods.

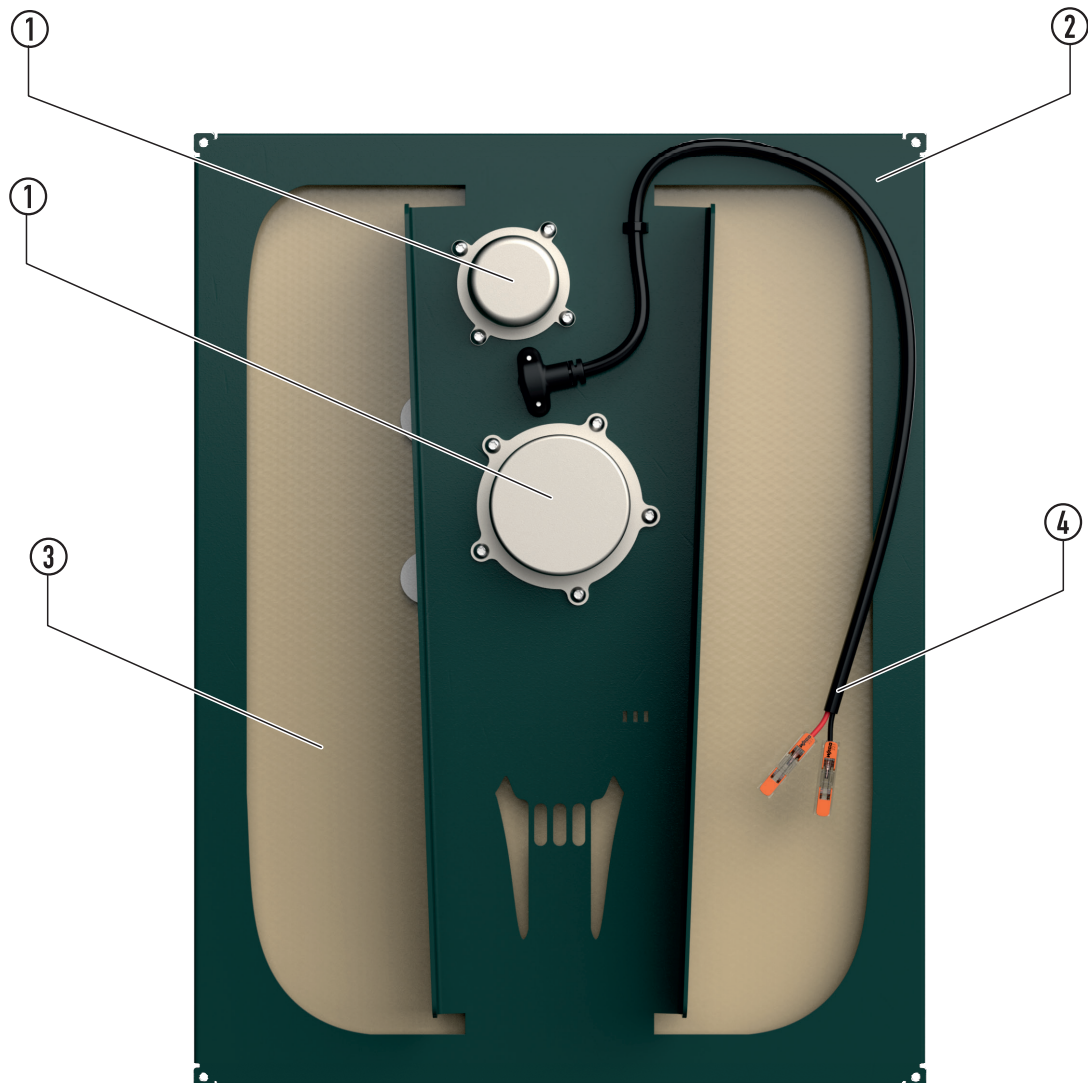
Always choose the installation guide that matches the speaker and wall type for your installation.

While the Amina Sapphire speaker is very suitable for drywall installations where a skim coat covers the speakers and feathers out over the surrounding drywall, the Amina Edgeⁱ product line is designed specifically for drywall installations requiring only the perimeter joint to be taped and filled

Environmental

- The Amina Sapphire range features a highly stable and robust composite panel structure allowing application within a very wide range of construction materials. These include thick coat plaster solutions and other finishing methods that may take days (rather than hours) to dry. Surfaces can also be finished with non-permeable coating.
- Before installing, ensure that the building is environmentally sealed, de-humidified to a maximum of RH65%, and at a stable temperature of at least 10 degrees centigrade (50 degrees Fahrenheit)
- Please be aware that when this product is fitted in simple (stud or rafter with plasterboard/floorboard attached on either side) stud walls or wooden rafter ceiling/floor structures, vibrational energy is inevitably transferred into the building 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 isolated stud walls or ceiling sections where possible. Special care should be taken when installing the product in multi occupancy buildings.
- During installation take care to use appropriate and suitable joint filling compounds to fill the gap between speaker and the surrounding surface. This gap should be no less than 2mm and no more than 5mm in width.
Inappropriate compounds used in such a joint can shrink and crack excessively and lose strength.
Allow the joint to dry thoroughly before applying surface skim coats, as shrinking in the joint depth whilst drying could create a very slight embossed outline in the finished and decorated surface.
- As a general rule in the construction industry, any drying process should be gradual rather than forced with excessive heat otherwise materials can lose strength and can crack.
- Amina Technologies take no responsibility for inappropriate use of materials and environmental conditions under which they are applied.

Overview



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

The Overview image shows a Sapphire375 loudspeaker with dual magnet structures. Other models may feature different numbers of magnet structures and electrical connectors.

Setup tips

Protection devices

Amina loudspeakers must always be installed with an electrical overload protection device, supplied or approved by Amina. These devices help ensure the loudspeaker operates reliably for many, many years ahead, by limiting and protecting against temporary excessive audio signals that could damage the product.

Please refer to the instructions supplied with the devices and full warranty information for further details.

Alternatively, use the Amina A100Q amplifier or one of the other digital amplifiers recommended by Amina for the best protection and acoustic performance.

Installation Backboxes

Amina Sapphire 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.

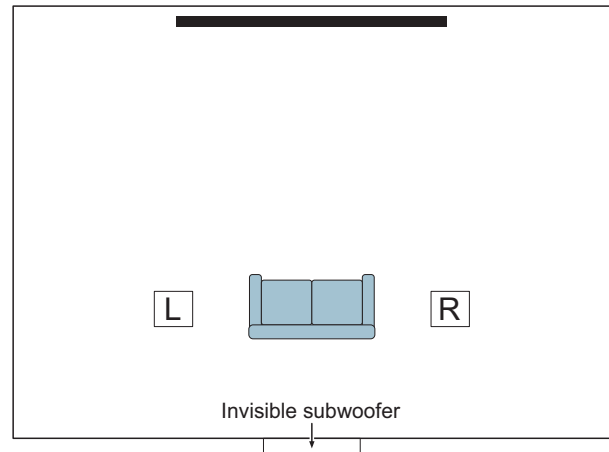
Wall or Ceiling Placement

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').

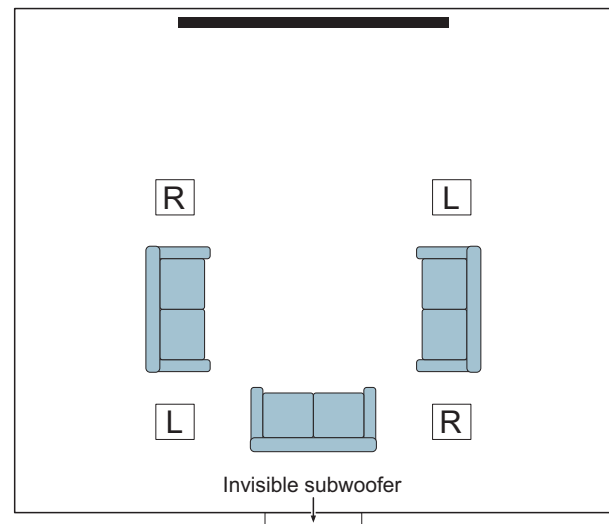
In dedicated listening rooms where loudspeakers are used in stereo or multi channel systems, position them in the walls so that the centre point of the speaker is approximately 1 – 1.8m (3.5 – 6') from the floor. This will give excellent results, but don't worry, if this is not possible to achieve in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

Simple immersive sound solutions

Placing Amina Sapphire products in a ceiling, located above either end of a sofa for example, provide an incredible enveloping sound field across the seated occupants.



The diagram below shows the overhead view of a system where there are three sofas in a room. For this installation, the four Amina speakers are positioned in the ceiling to cover the full seating area, driven by just the two (left and right) channels of a stereo system.



Optimal lounge ceiling speaker positions enable all seats to enjoy incredible TV sound.

Setup tips

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.

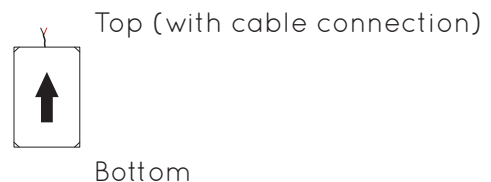
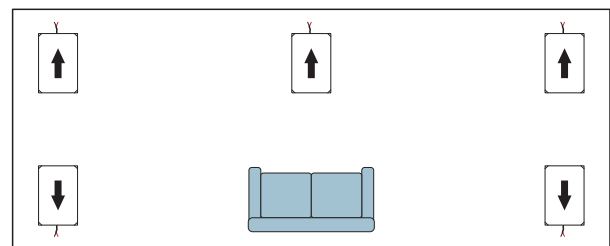
In addition to the above characteristics, the radiating surface of an Amina speaker is very stiff and undergoes very small amounts of movement in order to generate high sound pressure levels. This means that the loudspeakers are inherently "fast" making them highly articulate loudspeakers.

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/ceiling 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 subwoofer is used.

Setup tips

System Requirements

From a system compatibility point of view your speaker (and it's accompanying Guardian 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.

The cable connectors supplied with the Sapphire speaker require 12-18 AWG cable (0.8mm - 4mm). Amina recommends you connect your loudspeakers to your amplifier with 16AWG OFC (oxygen free) cable or 14AWG for runs over 10m to avoid any chance of reduced efficiency and restricted audio bandwidth.

For 2.1, 5.1, 7.1 and other multi-channel 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. (Guardian 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 invisible loudspeakers supplied with 100V or 70V line transformers fitted.

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

This installation guide covers the fixing of a Sapphire loudspeaker into a cavity wall.

Required mounting accessories will be -

BackboxCV345 345 mm width for Sapphire375, Sapphire250

All speakers Shims

Type	Application	Image
BackboxCV345 For cavity walls and ceilings	Used to install Sapphire loudspeakers in cavity walls and ceilings to reduce airborne sound generation from the rear of the speaker and create an optimum acoustic cavity.	
Firehood 345 For fire-rated ceilings	A 60 minute fire rated overjacket to use with the BackboxCV, which maintains 1 hour fire-retardancy, where necessary, and additionally reduces airborne sound generation from the rear of the speaker.	
Shims	Various thicknesses available to align the speaker with the front of non-standard plasterboard structures.	
HushMount	The HushMount is a robust, inert installation accessory, engineered to damp mechanical vibration transfer into the surrounding structure—improving audio clarity and reducing room-to-room transmission. Primed in white and ready for finishing, HushMount can be installed using standard plasterboard techniques, allowing the speaker and mount to be seamlessly blended into the surface.	

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

Installation



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

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

Amina speaker protection devices

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



Amina speaker protection devices are designed to work with a single speaker. Never connect more than one speaker onto a single Amina protection device.

Refer to the table on the next page for more detail of protection options for short to medium periods of time.

However, common sense should always prevail. Your product should never be operated at repeated or consistently high audio levels. Never operate your Amina speaker at a level where audio reproduction appears distorted.

For the ultimate in protection and performance, use the Amina A100Q multi-channel amplifier or other correctly set up digital DSP amplifiers. Consult the Amina Customer Support Team for advice.

Installation

Amina speaker protection devices

There are three types of protection device.

Type	Application	Image
Guardian ²	This sophisticated 2-stage active circuit design responds to RMS and peak audio events in an instant, eliminating any opportunity for Amina invisible loudspeakers to be overloaded with excess power from audio system events or user error, in an appropriately configured audio system.	
Guardian ⁸ and Guardian ¹⁶	Flexible multi-channel Guardian protection units in a 1U case for optional rack mounting. Provides protection for installations of up to 8 (Guardian ⁸) or 16 (Guardian ¹⁶) Amina Sapphire loudspeakers of any type.	
A100Q amplifier	Absolute protection of a loudspeaker is possible by sensing and controlling output voltages within the amplifier driving that loudspeaker. The Amina A100Q amplifier integrates clean and powerful amplification (4 channels at 100W each) with sophisticated digital sensing and control technology to deliver the ultimate protection for your Amina invisible speaker. It both prevents excessive audio signals from ever reaching the speakers whilst allowing them to perform at their absolute peak at all times. This is achieved thanks to some clever internal digital signal processing software that knows exactly how to get the best from each speaker.	

Installation

Cutting the opening for the BackboxCV



IMPORTANT:

The BackBoxCV must be fixed to the plasterboard only. Never attach directly to the stud work or near supporting structure.

Locating joist work

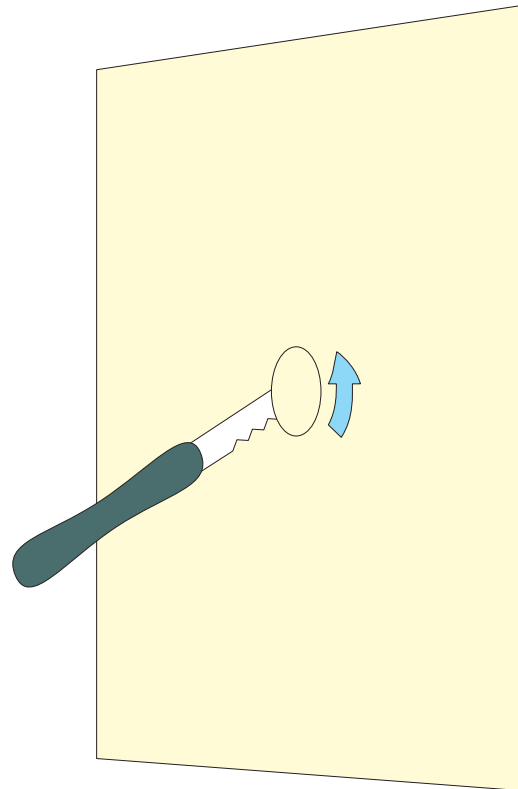
When you have chosen your speaker locations, and before cutting into the plasterboard, it is important that you locate the position of the wall studs.

Ensure the spacing between them is at least 5mm greater than the width of your Amina Sapphire speaker.

The following method is highly recommended to measure the distance between the joists.

Check the width between the joists

Using a padsaw or sharp knife, cut a hole in the centre of the area where the speaker will mount.



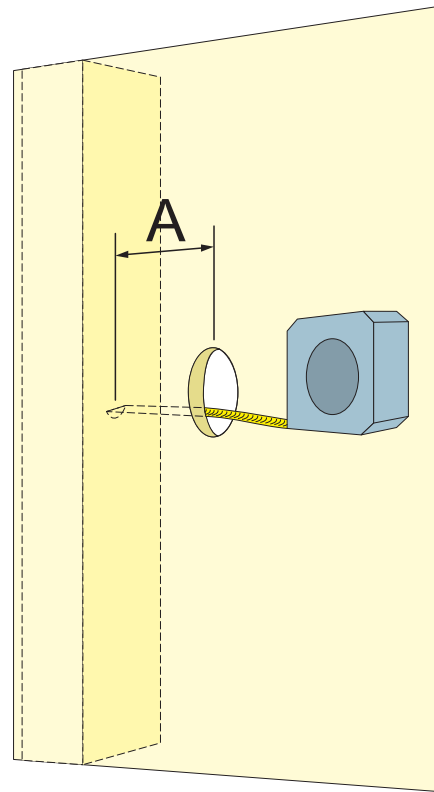
Installation

Cutting the opening for the BackboxCV

Check width between the joists

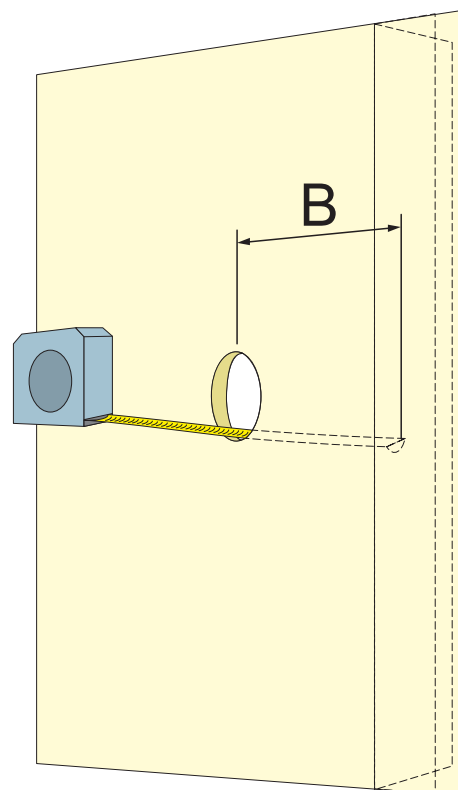
Measure from the centre of the opening to the joist on the left (A in the top image) and the joist on the right (B in the bottom image).

From these measurements you can establish the width and centre of the space between the joists.



Check that the total distance $A + B$ is greater than the dimension shown below to allow clearance for the BackboxCV model you are installing.

BackboxCV	Distance A+B
BackboxCV345	350mm (13 ³ / ₄ ")



Installation

Cutting the opening for the BackboxCV

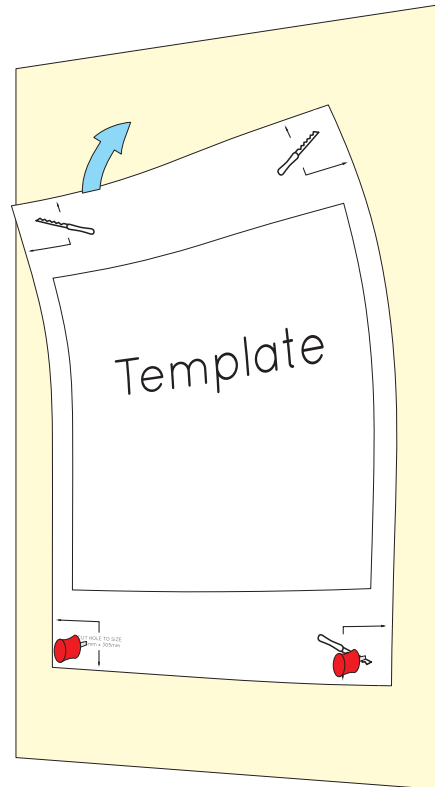


IMPORTANT:

We strongly advise that joists are not cut to make space for the backbox. Any activity of this sort may well influence the structural integrity of your property.

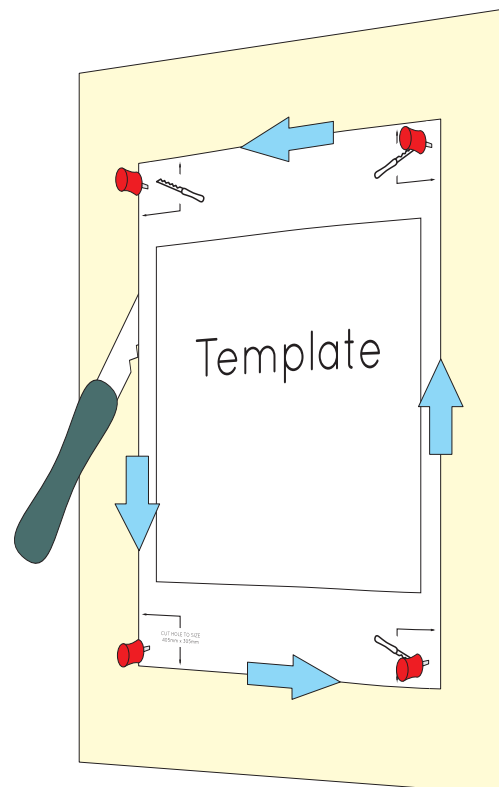
Fix the template to the wall

The speaker is supplied with a template. Tape or pin the template to the wall in the space between the joists.



Cut around the template

Cut around the mark on the template using a knife or padesaw.



Installation

Cutting the opening for the BackboxCV

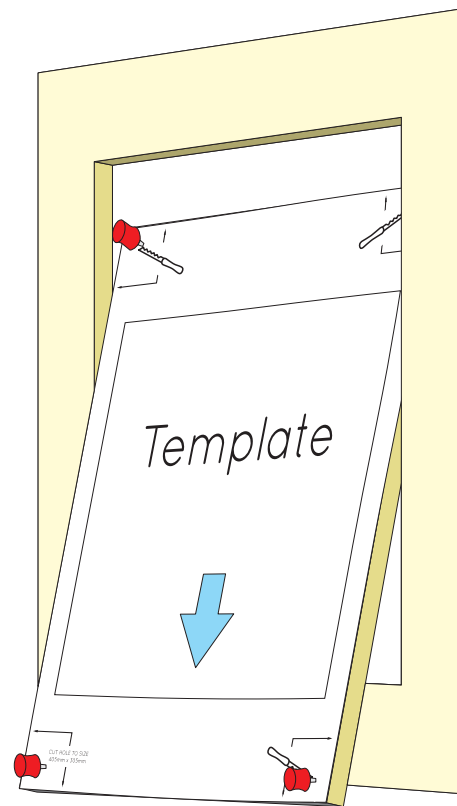
Remove the cut section

Lift out the cut section of the wall.

Check the size of the opening.

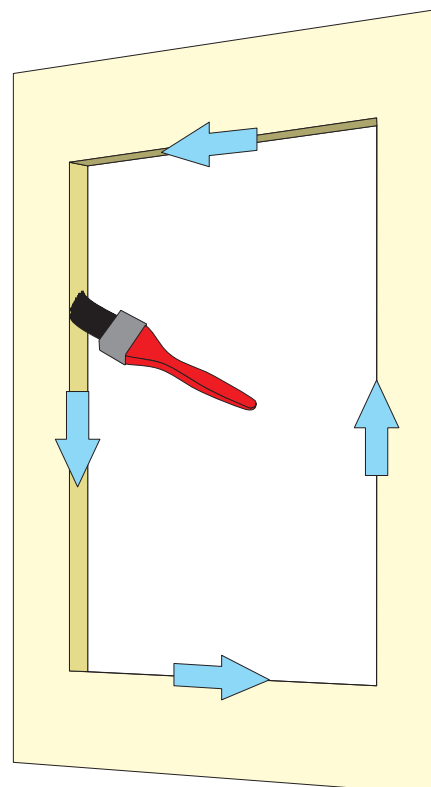
This should measure -

BackboxCV	Opening size
BackboxCV345	455 mm x 350 mm (17 ⁷ / ₈ " x 13 ³ / ₄ ")



Seal the cut edge

- For optimum results, seal the cut edge of the plasterboard with a plaster primer. This will enhance the strength of the future filled joint.



Installation

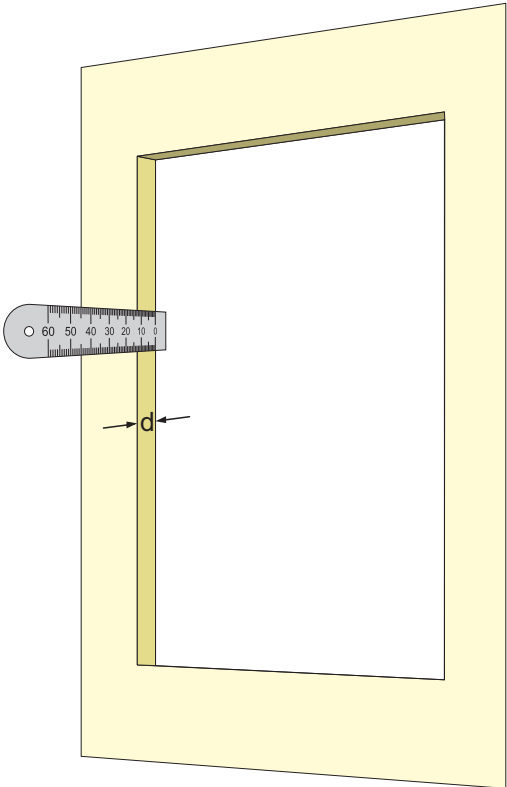
Using shims

Check if shims are required

Measure the thickness of the wall (d).

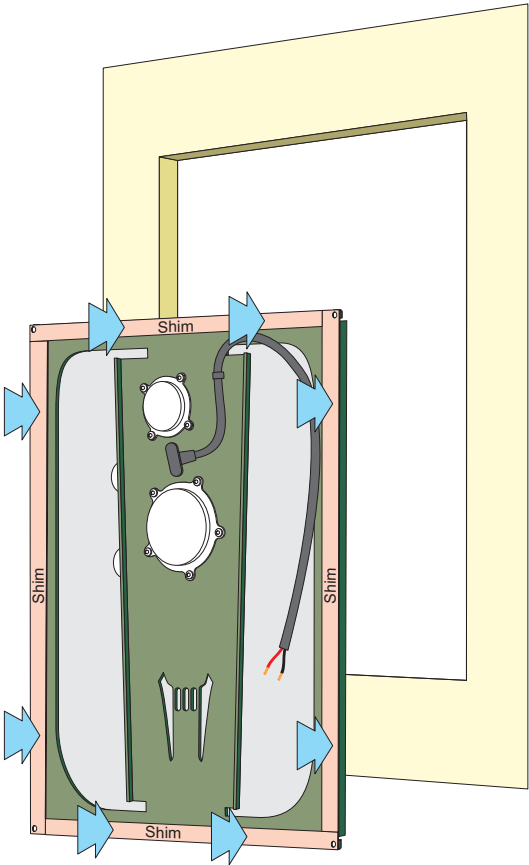
Referring to the table below, check if any shims will be required.

d ↓	Shim ↓
12.0 - 13.0mm (¹⁵ / ₃₂ " - ³³ / ₆₄ ")	-
13.0 - 14.0mm (³³ / ₆₄ " - ³⁵ / ₆₄ ")	1mm (0.040")
14.0 - 15.0mm (³⁵ / ₆₄ " - ¹⁹ / ₃₂ ")	2mm (0.080")
15.0 - 16.0mm (¹⁹ / ₃₂ " - ⁵ / ₈ ")	3mm (0.120")



Fixing the shims

If shims are required, fix the shims to the speaker chassis as shown.

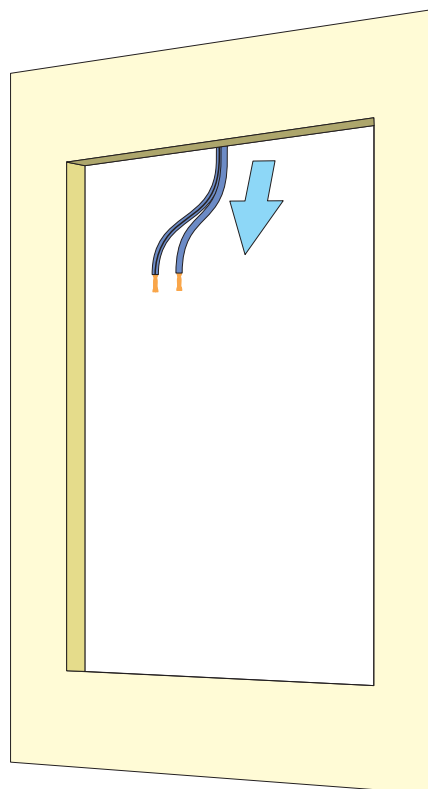


Installation

Fitting the BackboxCV

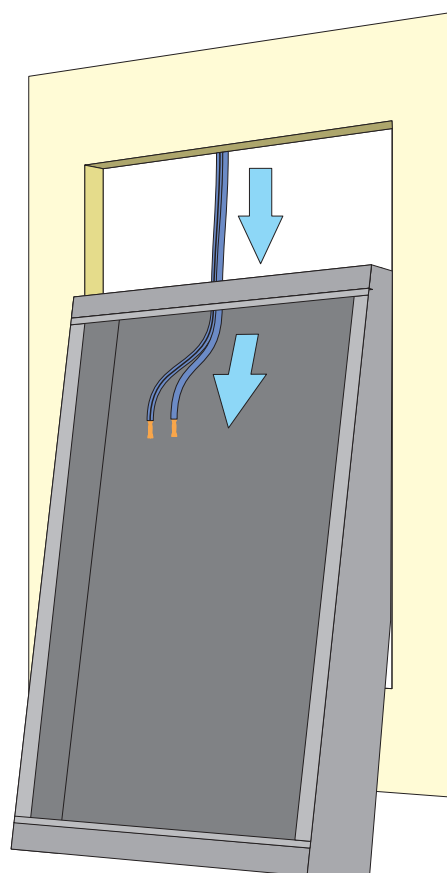
Feed the cable

Feed the cable from the amplifier to the opening where the BackboxCV will fit.



Wire the BackboxCV

Feed the wire through the cable grommet in the wall of the BackboxCV.

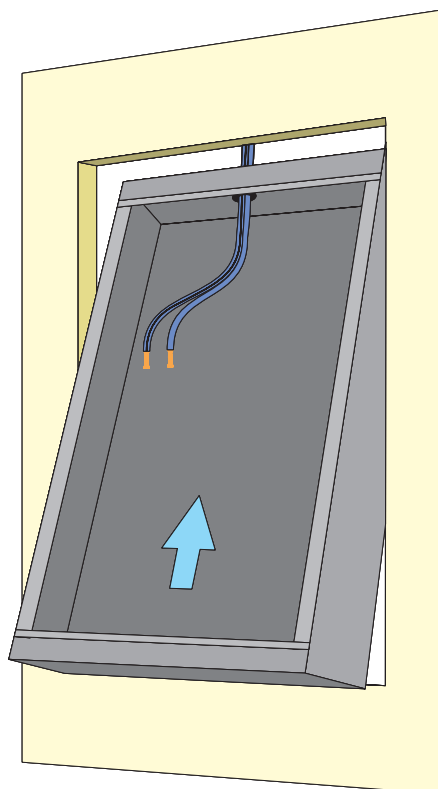


Installation

Fitting the BackboxCV

Hold the BackboxCV in place

Feed the BackboxCV into the cavity behind the opening as shown.



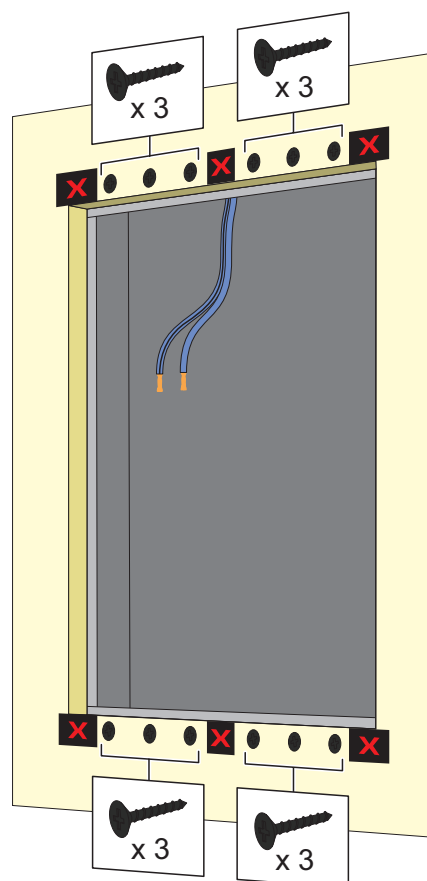
Secure the BackboxCV

Holding the BackboxCV in position, screw through the wall to secure the BackboxCV with 12 screws.



CAUTION:

Avoid fitting screws through the keep-out areas shown when screwing the BackboxCV to the wall.



Installation

Fitting the speaker

Lever splices

Amina Sapphire speakers are supplied with lever splices to join the cable from the amplifier to the speaker wires.

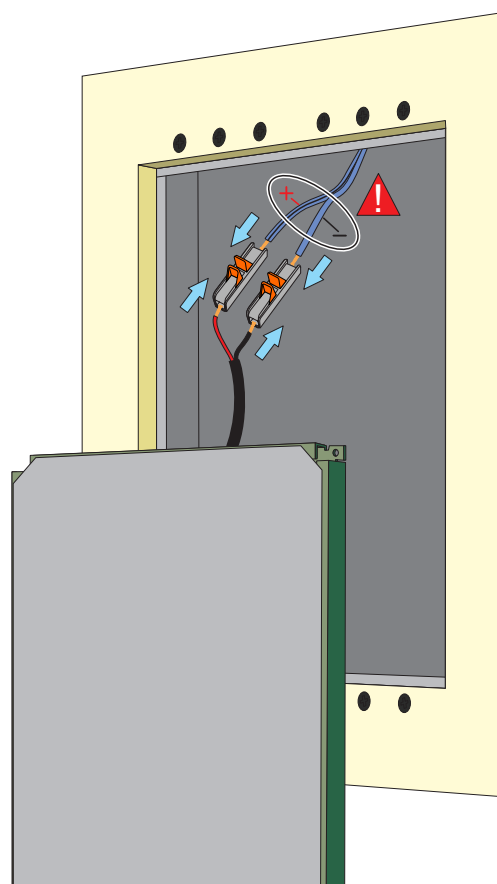
Prepare the wires

- Strip the insulation from the ends of the cable and twist the strands together.
- Identify the polarity of your cable. This will be indicated by a stripe, colour or rib to indicate the positive wire.

Connecting the positive wires

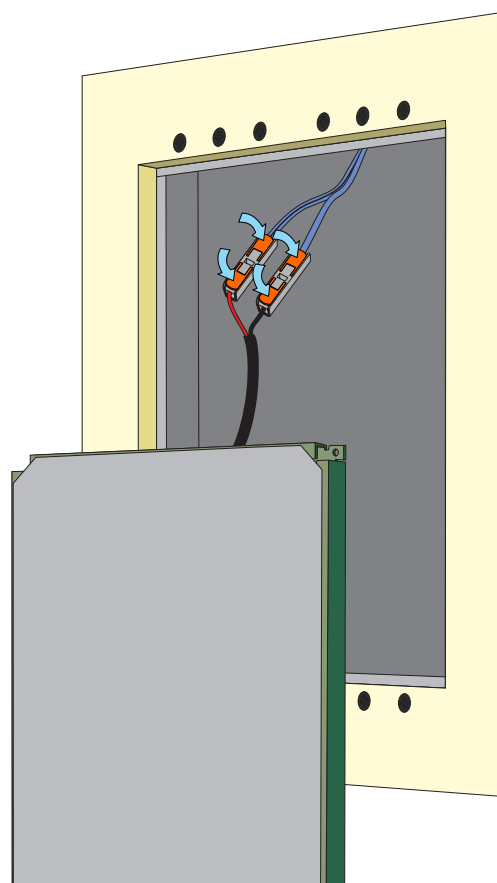
The positive wire will connect to the red wire from the speaker.

- Feed the positive wire from your cable and the red wire from the speaker into one of the lever splices as shown.
- Push the wires fully into one of the lever splices.



Secure the positive wires

- Press down the latches on the lever splice to lock the positive wires in place.



Connecting the negative wires

- Repeat the last two steps to connect the negative wire from your cable to the black speaker wire using the second lever splice.
- Check that all wires are securely retained in the splices.

Installation

Fitting the speaker

Fit the speaker into the BackboxCV

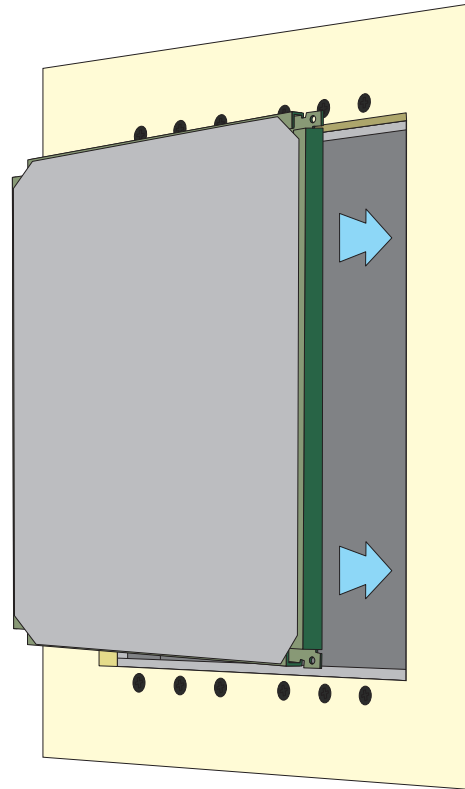
The speaker can now be fitted into the opening in the wall to sit on the mounting flanges of the BackboxCV.



CAUTION:

Ensure that the speaker cabling is not touching any part of the speaker or the BackboxCV.

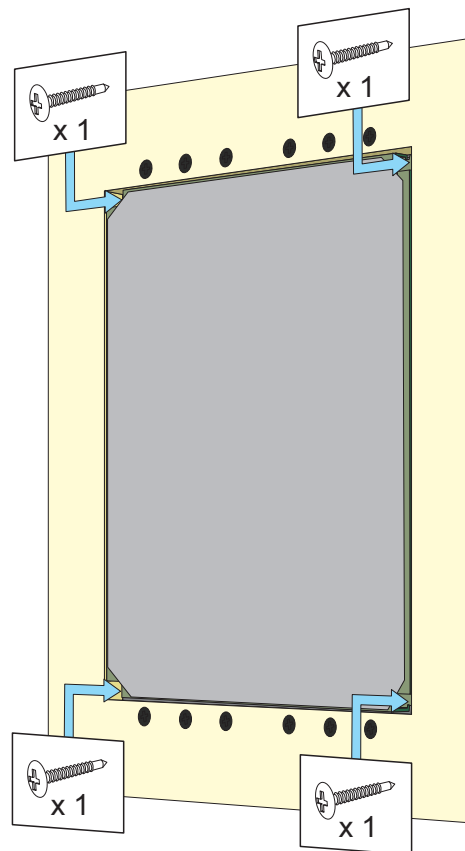
To avoid this the cable can be laid behind mineral wool, recycled cotton or other wadding.



Fix the speaker in place

Screw the speaker to the BackboxCV using the four screws supplied.

NOTE: If shims have been used to correct for the surface thickness it may be necessary to use longer stainless steel screws (not supplied) to secure the speaker into position.



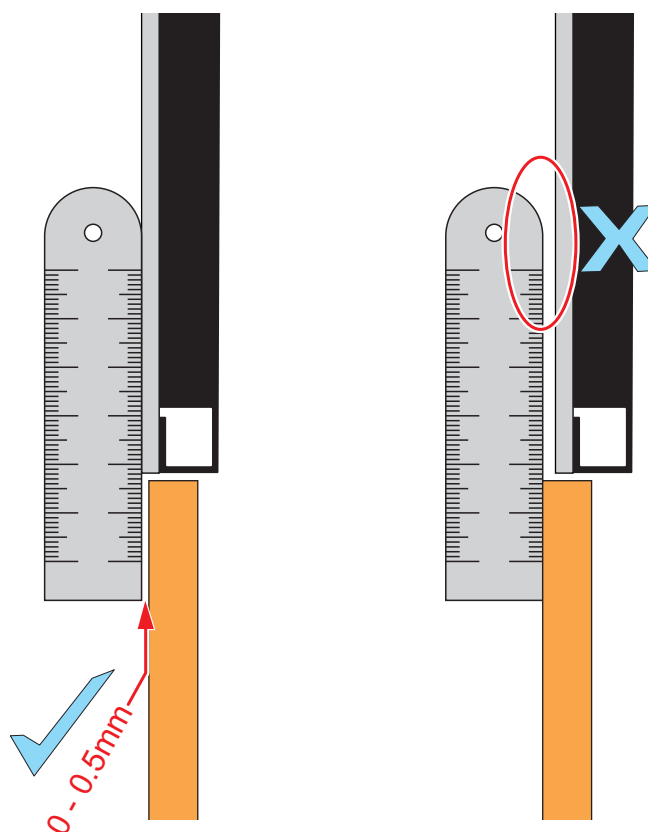
Installation

Check alignment

Check the alignment of the speaker with the wall

Before proceeding, use a straight-edge to re-check that the front face of the speaker sits slightly above the surface of the wall.

If the front face is sitting behind the wall, remove the speaker and adjust the shims until the alignment is correct.



Testing

Testing the speaker

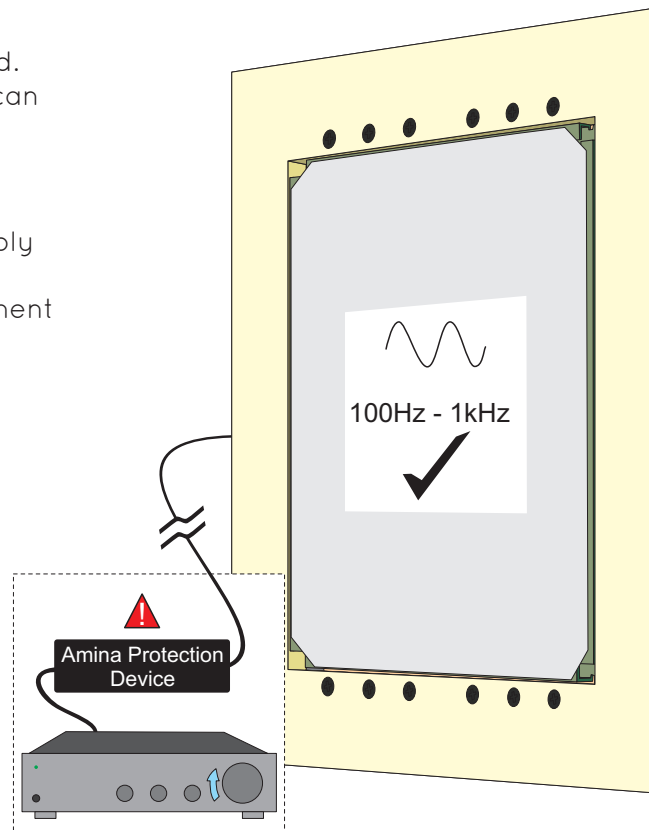
At this stage the speaker must be tested. If any problems are found the speaker can be easily removed before plastering.



CAUTION:

Do not use a battery or DC voltage supply to check continuity or phase check as there is no forward or backward movement of the panel.

DC voltage can damage the speaker.



Resistance test

Using a multimeter and without the Amina protection device connected, check the nominal impedance (DC resistance) of the speaker at the amplifier end of the speaker cable.

Allowing for approx. +10% for cable resistance, the measured impedance should coincide with the values on the respective loudspeaker datasheets.

If it measures significantly differently, check for breaks or shorts in the cable.



CAUTION:

Amina protection devices

Once the resistance test is successfully completed, connect the Amina protection device at the amplifier end of the cable, where it will be accessible, before proceeding with further tests.

Testing

Sweep test

Amina recommends a tone sweep be used at a moderate volume level (0.5 Vrms). Such a test will quickly highlight any buzzes or rattles that could be caused by loose screws, cables touching the speaker or loose elements/studs within the wall/ceiling itself.

NOTE: A tone sweep test must be run initially as it is the most reliable test for buzz and rattle. Music tests are useful, optional tests for final confirmation.

Sweep testing tip

Tone sweeps may be generated by apps, such as

- Signal Gen by Mediapunk Studios
For iOS & Android
- Tone Generator by TMSoft
For iOS & Android
- Online Tone Generator by T. P. Szynalski
For Web browser

Generating a controllable tone sweep, allows you to focus on specific frequencies that may be highlighting issues in the install or surrounding materials, while you identify the source of the issue.



CAUTION:

Never over-drive the speaker with a single tone or expose your hearing to loud, single tones during this test.

Music test

Play music to check for buzzes and rattles during transient peaks: if these are apparent, check the above points again. The overall speaker performance must be clean and distortion free.

Problems during test

If you encounter any rattling or buzzing problems during test, check the following section to resolve these issues.



CAUTION:

Never proceed with plastering until the speaker has passed both sweep and music tests.

The following list may help you trace the cause of any rattling or buzzing problems.

Insecure plasterboard

If the plasterboard is not securely fastened to the joists, this could create a buzz or a rattle. Apply more screws to secure the plasterboard if necessary - particularly around the speaker location.

Metal frame constructions

Ensure all crossover points within the metal frame sections are secured together. This can be achieved by applying drywall screws through the plasterboard surface and through the metal crossover points.

If they are not secure this may well lead to audible vibrations and rattles.

Refer to our advice on metal frame construction techniques on page 3.

Cable buzzing

Ensure that the speaker cable is not touching any part of the speaker as this can lead to buzzes and rattles. To avoid this it is advised to lay the cable behind mineral wool, recycled cotton, polyester or other wadding.

Lighting fixtures

Ensure lighting fixtures, especially those closer to the loudspeakers are of a solid construction and are firmly fixed in place.

Finishing

Cutaway view

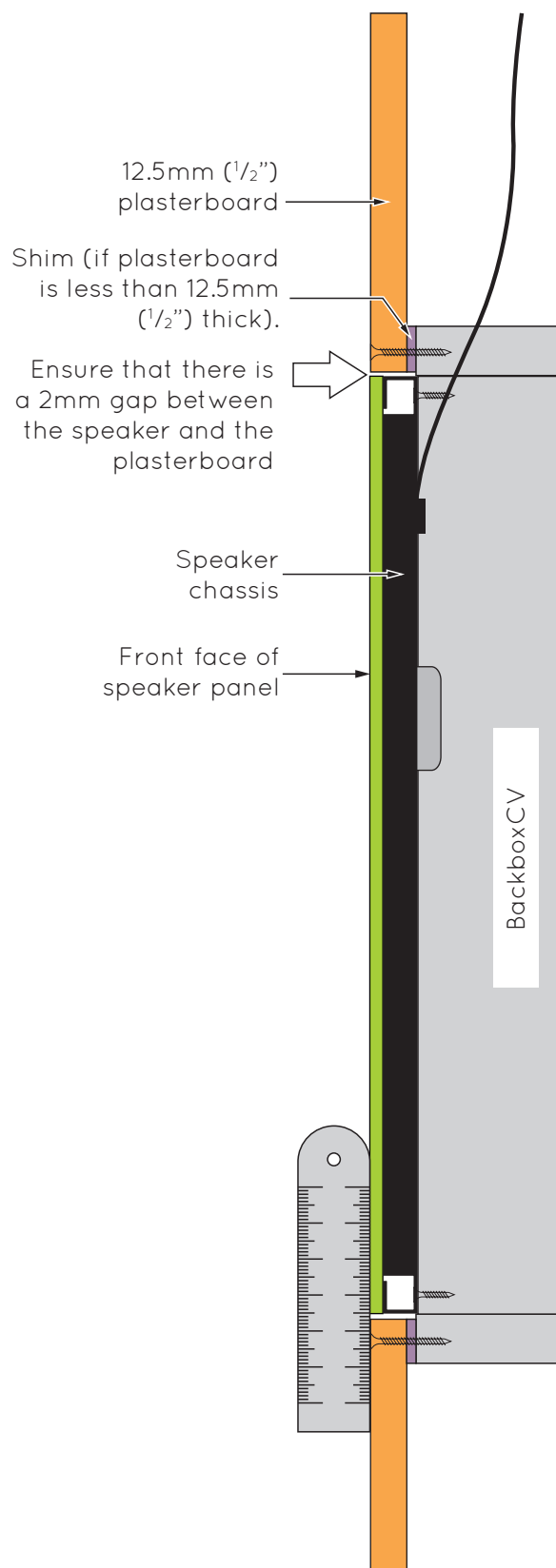
This cutaway view shows a section through the speaker and BackboxCV, assembled to the wall before full plaster skim finishing.



Wall



Speaker panel



Finishing

Preparing the speaker for plastering

**CAUTION:**

Never proceed with filling until the speaker has passed both sweep and music tests.

Filling the perimeter

Once the speaker is fixed into place, the gap must be filled with plaster to bond the edge of the panel to the edge of the plasterboard.

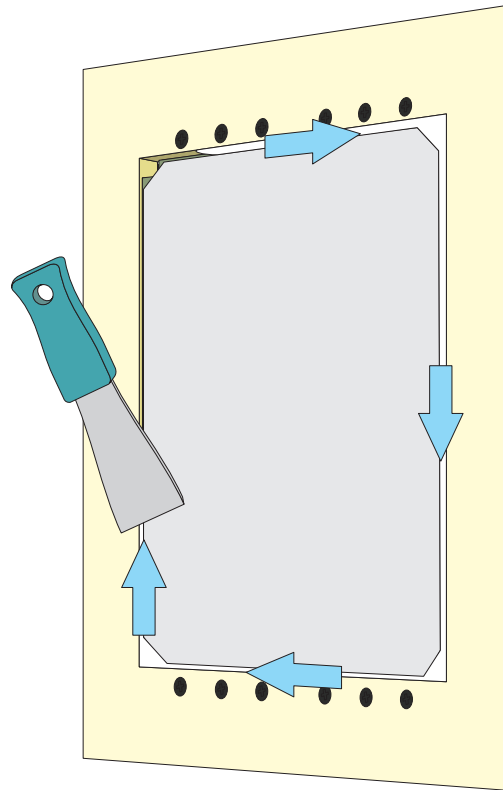
Wipe away filler from the panel surface (both the outer perimeter and raised sections).

Use a low shrinkage, strong repair plaster such as British Gypsum Gyproc-Joint-Filler* or other similar joint compound.



Ensure there is a gap of at least 2mm around the perimeter of the speaker allowing plaster to be pushed into place.

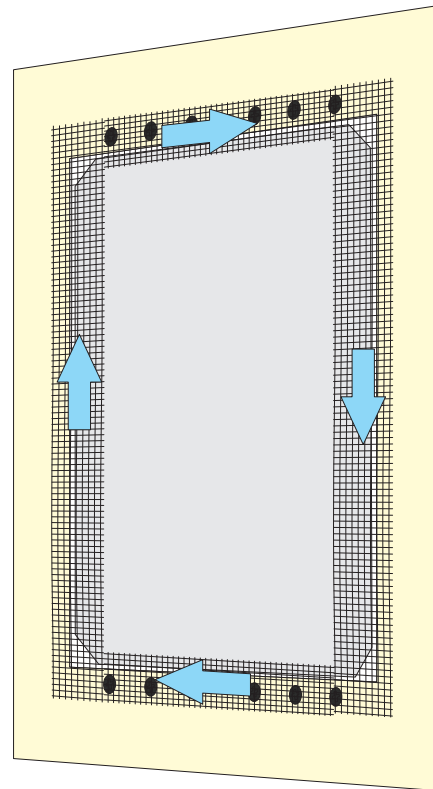
*NOTE: Gyproc Easi-Fill dries to a much softer state and should not be used.



Finishing

Taping the surface

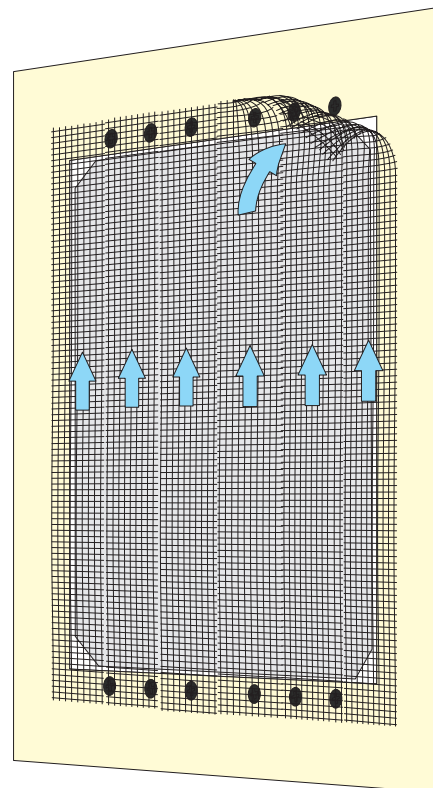
- Prior to taping, wipe the surface clean with a damp cloth and allow it to dry.
 - Apply professional plasterboard self adhesive fibreglass joint scrim around the perimeter of the speaker face.
- Ensure it covers the plasterboard joint.*
The tape provides increased surface area for the plaster skim coat to bond to the panel surface.



Taping the full panel surface

Alternatively, tape the full panel surface using multiple strips of scrim tape.

- Prior to taping, wipe the surface clean with a damp cloth and allow it to dry.
 - Apply professional plasterboard self adhesive fibreglass joint scrim across the area where the speaker is mounted.
- Ensure it covers the plasterboard joint.*
Amina can provide rolls of 500mm wide adhesive scrim to do this in one operation if required.
The tape provides increased surface area for the plaster skim coat to bond to the panel surface.



It may take some days for the perimeter fill to dry fully.

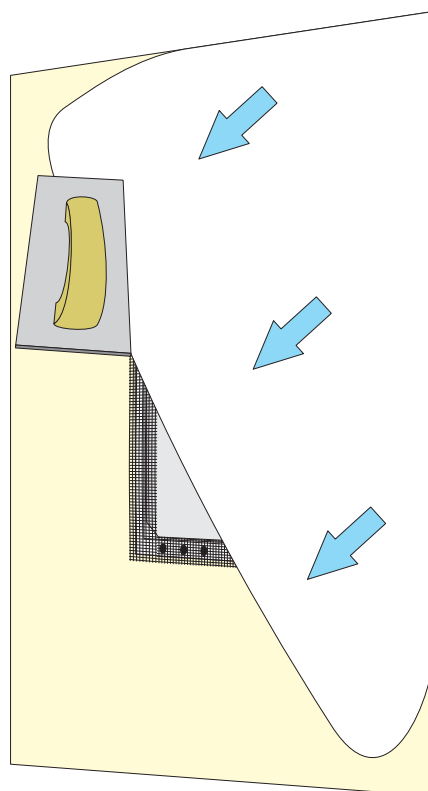
Finishing

Full plaster skim coat

Apply plaster skim coats to the entire wall surface and loudspeaker.



The maximum total plaster thickness must be no more than 2mm over the speaker.



Decorating

Drying

Allow your plasterwork to dry completely.

Re-test

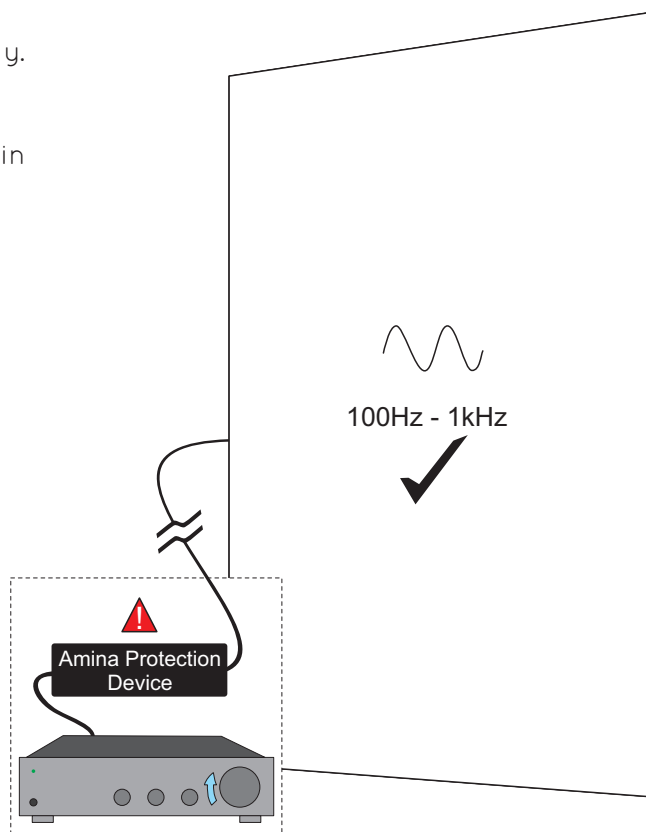
Before decorating, test the speaker again with a frequency sweep and music.



CAUTION:

Do not use a battery or DC voltage supply to check continuity or phase check as there is no forward or backward movement of the panel.

DC voltage can damage the speaker.

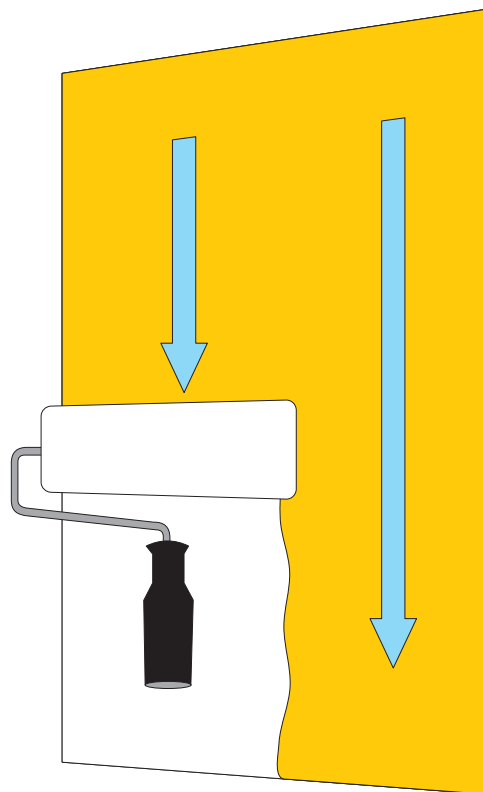


You can then paint the surface or hang wallpaper in the usual manner.

Decorating

Decorating

Amina Invisible speakers have been optimised for three coats of emulsion paint once plastered. Additional coats will cause very small reductions in the maximum sound pressure levels achievable.



Final Test

Checking the completed installation

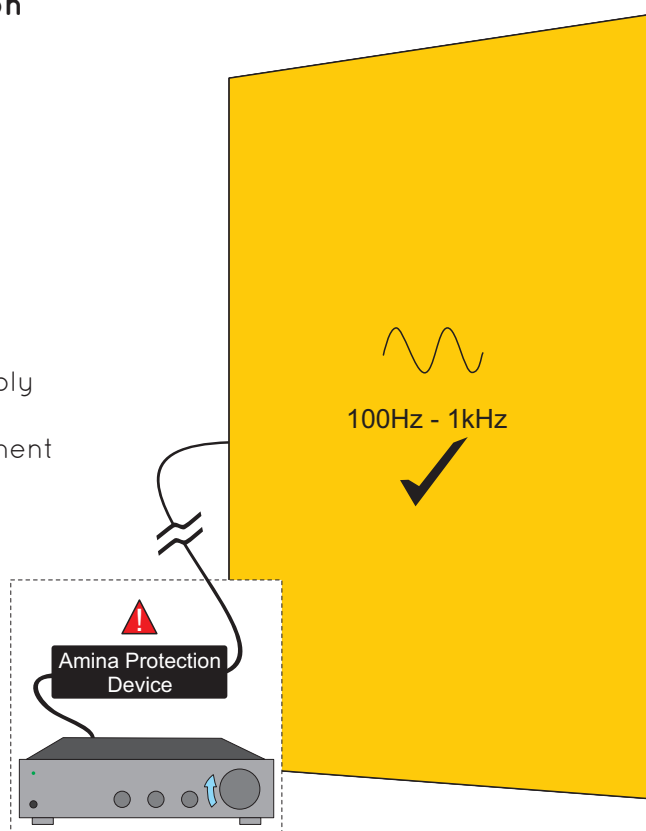
With decorating completed, run a final test of all the speakers in the system independently.



CAUTION:

Do not use a battery or DC voltage supply to check continuity or phase check as there is no forward or backward movement of the panel.

DC voltage can damage the speaker.



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.

Re-decoration

The wall or ceiling can be painted or redecorated any number of times, but please be aware that sound output will reduce very slightly with each coat.

Extreme care should be taken when removing wallpaper type coverings to ensure the panel 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 Gyproc-Joint-Filler as a 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.

Accessories

Subwoofers

ALF50SM

The 150W ALF50SM slimline, hidden subwoofer is the perfect fusion of compact design, easy installation, and powerful low-frequency performance. Featuring a full, birch ply cabinet and despite its small size, the subwoofer delivers a full-bodied audio experience, making it ideal for applications where space is limited but performance cannot be compromised. With its minimal footprint and impressive acoustics, the ALF50SM ensures superior sound while remaining largely hidden from view.

ALF50SM



Port opening

ALF80 (not available in North America)

100W 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 discrete, powerful bass response is achieved with only a small opening for the port required within the room.

50mm port opening

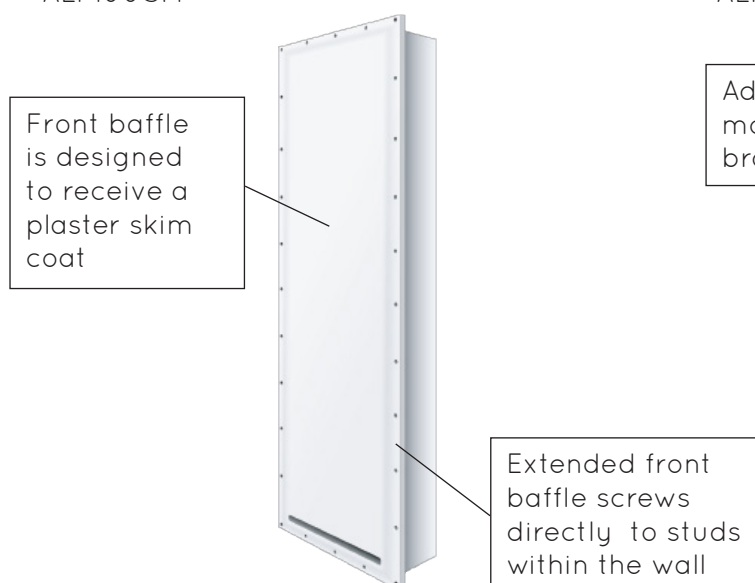
ALF80



ALF100SM/ALF100CV

The 200W ALF100 design is available in two variants, the 'plaster over' ALF100SM which mounts to the face of the wall studs in a 4" wall cavity or the ALF100CV which mounts behind the wall board, inside a wall cavity (requires a 5" stud wall), above a ceiling or below a floor. The ALF100CV can also utilise the space below kitchen island cabinets behind the kickboard, or simply locate under a sofa or other furniture. Both designs feature birch ply cabinets.

ALF100SM



ALF100CV



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.



CAUTION:

Do not use a battery or DC voltage supply to check continuity or phase check as there is no forward or backward movement of the panel.

DC voltage can damage the speaker.

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 have the correct polarity (+ to + and - to - from amp to speaker).
 - The Amina Guardian is an in-line high-pass filter and over-voltage protection unit that protects the speaker, and is designed to reset automatically when the voltage applied to the speaker is reduced. The Guardian may fail if exposed to extreme power levels for extended periods of time, and present a constant high impedance or open circuit. Both conditions will protect the loudspeaker panel. To check, remove the Guardian from the circuit and test the speaker at low volume or meter as below. If the speaker works or measures correctly, replace the Guardian by ordering an appropriate replacement from Amina.
 - Check that the 5V USB power supply for the Guardian is connected to mains power and is correctly connected. If the Guardian is not powered, it will not pass a signal though to the speakers.
 - Using an impedance meter, check the nominal impedance of the speaker (Guardian must not be connected) both at the loudspeaker 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, measured at the loudspeaker is dramatically different to 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.

Intermittent high volume following very low volume output

- The Guardian protection device is operating to protect the speaker causing a very low volume output. In quiet sections of the recording the Guardian will release the protection mechanism allowing full volume output, but will re-engage the protection mechanism again in louder sections of the track. Reduce the power level from the amplifier into your system. Consistent sound output will resume.

Very low output after speaker passes electrical tests

- With no audio signal applied, lightly push the panel in and out at its centre. 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.



NOTE: Excessive pressure on the front of the speaker panel may cause cracking in the plaster which may need to be filled.

Specifications

Sapphire series - Plaster over products

Model number	Sapphire250	Sapphire375
Dimensions	450mm x 345mm x 31mm (173/4" x 135/8" x 11/4")	450mm x 345mm x 31mm (173/4" x 135/8" x 11/4")
Weight	1.8kg (3lb 15oz)	2.0kg (4lb 7oz)
Nominal impedance	4 Ω	6 Ω
Frequency response (-6dB)	52 Hz - 20 kHz	50 Hz - 20 kHz
Sensitivity (@ 1m/2.83Vrms)	82dB	83dB
Rated max SPL	99dB	101dB
In-line protection unit (dual channel)	Guardian2 - AGP5	Guardian2 - AGP7
In-line protection unit (multi-channel)	Guardian8 / Guardian16	Guardian8 / Guardian16
Recommended high pass filter	30Hz (24dB/octave)	30Hz (24dB/octave)
Fixing options	Amina BackboxCV345 / BackboxSW345 / Tab or Block fixing kit / Firehood345	Amina BackboxCV345 / BackboxSW345 / Tab or Block fixing kit / Firehood345
Power handling (rms)	50W	75W
Power handling (peak)	100W	150W
Operating temperature range (non-condensing)	10°C - 45°C	10°C - 45°C
Manufacturer limited warranty	10 years (residential and commercial systems)	10 years (residential and commercial systems)

Fire resisting installation

Fire resisting installation is generally required in multi-level buildings such as offices, apartments and flats where the ceiling and any fittings in the ceiling must maintain a 60 minute barrier to fire.

The standard installations described in this guide for Amina Sapphire series invisible speakers will not meet the requirements of an installation that requires fire resistance.

If an installation does require fire resistance then it will be necessary to install commercially available fire hood type products or pre-build an appropriate plasterboard lined compartment at the rear of the loudspeaker. Alternatively consider installing Amina Edge 7i speakers which can (when specific installation instructions are followed) meet the requirements of EN1365.2:2014 without the use of an Amina fire hood.

If you are in any doubt concerning the selection or installation of Amina speakers or accessories in an installation that requires fire resistance, contact Amina Technical Support.



Warranty information

Limited Warranty

Amina loudspeakers are designed to operate reliably for many years. Correctly installed in accordance with these instructions, Amina warrants the loudspeakers against defective materials and manufacturing workmanship for a period of ten years in residential and 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 has not been tested to European Construction Products Regulations EN 54-24 and therefore must not be used in voice evacuation systems located within the European Union.

Amina offer a specific product range which is EN54 certified for European life safety applications. Please contact Amina for details.

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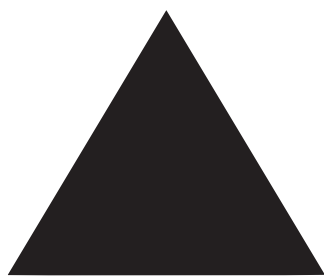
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IMMERSIVE INVISIBLE SOUND

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Sapphire with BackboxCV, full skim V2
