

BluCube® CXC Series

Circular, flush-mount, in-wall/in-ceiling loudspeakers

Owner's Manual & Installation Guide

CXC-650

CXC-800-3

CXC-650-S



www.blucubespeakers.co.uk

Introduction

Thank you for your purchase and welcome to the growing number of satisfied BluCube listeners. Please read the following installation and operation guidelines carefully to ensure enjoyment of your home audio system for years to come.

Although we recommend that BluCube flush-mount loudspeakers should be fitted by competent installation technicians, installation is also well within the means of a competent DIY enthusiast when performed with the aid of this instruction guide. You may also find it useful to visit our web site for the latest tips and techniques on installation.

Your BluCube flush-mount loudspeakers are designed to blend into your home interior while providing superior sound quality. At BluCube we continuously strive to improve our products and it is for this reason that we reserve the right to change product specifications without notice. The information concerning product specifications and instructions in this manual do not necessarily set forth all technical or other specifications of BluCube products.

Important Safety Information

- **Do not** use this or other electrical equipment near water or other liquids
- **Clean only** with a dry cloth
- **Do not** block any ventilation openings. Install in accordance with all safety standards and regulations.
- **Do not** install near any heat sources such as stoves, radiators, heat registers, amplifiers or any other apparatus producing heat.
- **Use** attachments and accessories as indicated by the manufacturer.
- **No user-serviceable parts inside.** Refer all servicing to qualified service personnel.
- **Warning:** To reduce the risk of fire or electrical shock, do not expose this apparatus to rain, moisture or other liquids.
- **Warning:** To prevent injury, this apparatus must be securely attached to the wall/ceiling in accordance with the installation instructions. No naked flame sources such as candles should be placed close to the product.
- **Caution:** Changes or modifications not expressly approved by the manufacturer could void the warranty on the apparatus.



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Features

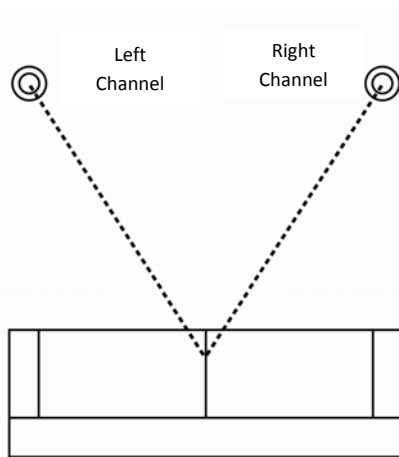
Your BluCube® loudspeakers feature the following:

- **Woven Kevlar® Cones:** Kevlar® has physical properties that make it ideal for loudspeaker drivers and consequently is found in many of the world's finest loudspeakers. Its combination of stiffness and strength-to-weight ratio means that it results in a more precise and defined sound reproduction.
- **Titanium tweeters:** Another feature often found in the world's finest loudspeakers. The stiffness and lightness of a titanium dome tweeter results in cleaner, brighter audio definition.
- **Adjustable tweeters:** The tweeters in your BluCube loudspeakers are mounted in an orbital socket and can be adjusted by gently pressing on their edge. This adjustment allows for directing the sound when the speaker may need to be offset from an ideal listening position due to aesthetic or physical reasons.
- **Stable tweeter housing:** The tweeters in our circular flush-mount loudspeakers are mounted on a supremely stable bridge rather than on a central pole as found in many current designs. This allows the speaker to handle more power with increased cone stability resulting in lower harmonic distortion.
- **4/8 ohm impedance switching on the circuit board:** The ability to switch between 4 ohms and 8 ohms impedance is useful to match the speakers to your amplifier and is also useful if you wish to set up multiple pairs of speakers connected to a single amplifier.
- **Attenuation Switches:** Your BluCube loudspeakers are fitted with high frequency (tweeter) and low frequency (woofer) attenuation switches (and midrange on CXC-800-3). These enable you to adjust the sound properties of the speaker to suit your personal listening preferences and the acoustic properties of the room in which you are installing them.
- **Cut-out template:** BluCube loudspeakers come with a cut out template to allow the installer to accurately measure the hole to be cut out in the wall or ceiling surface resulting in an easier installation process.
- **Paint Mask:** BluCube loudspeakers come with a paint mask to allow the installer to protect the surface of the tweeter and the woofer cone while (optionally) painting the surrounding speaker baffle.
- **Pre-construction bracket:** All BluCube loudspeakers come with tough, plastic pre-construction brackets. Their use is optional, but can be very helpful to the installation process at the time the plasterboard is about to be attached to the wall/ceiling. Therefore they would be used only during more extensive renovations and not when fitting the loudspeakers into an existing surface.
- **Paintable Grilles:** Your BluCube loudspeakers come with steel grilles pre-painted in white. These may be painted if required. **Important:** Please refer to the section later in this manual on painting grilles before embarking on this.
- **Grille removal tool:** Your BluCube loudspeakers come with a pair of finger hooks to facilitate the removal of the grilles in the event that you wish to adjust or remove your loudspeakers.
- **Installation Guide:** This installation guide is included with your BluCube loudspeakers. From time to time we will publish updates to the guide and so you may wish to refer to our web site for the most up to date version.



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Stereo Sound Layout



Listening Area

To ensure the best stereo effect, place speakers along a common wall equal distances from the intended listening area



BluCube CX-Series loudspeakers feature swivelling tweeters to aim sound directly at the listening area to compensate for offset mounting.

Installation Guide

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Speaker Placement

The pivoting tweeters in BluCube loudspeakers are able to compensate for unusual placements of the speakers themselves. However, the ideal positioning of the speakers should be at equal distances from the intended listening area and along a common wall. This helps to ensure the best stereo effect.

Naturally, intended listening positions are rarely static and they may vary quite considerably within a room. In these circumstances, you can confidently compromise on the ideal location and use the pivoting tweeter to assist without impacting your listening pleasure.

2-Channel Audio Placement

In standard two channel audio systems, the ideal distance between the left and right channel speakers should be in the range of 1.8m to 3.0m apart. If the layout of the joists and light fittings permit, the speakers should be equidistant from the most commonly envisaged listening position.

Distributed Audio Placement

In some cases, where the room is large, you may wish to consider the use of two (or more) pairs of speakers in order to provide a wider and more even dispersion of sound. A more even dispersion in this way means that people within the room are more likely to be equidistant from the speakers so that there are no hot or cold spots of audio volume.

BluCube loudspeakers possess extremely smooth and predictable off-axis frequency response. The chart below shows how far apart the speakers can be placed in a distributed audio system. Again, this is a guide and should not be treated as mandatory. The calculations are based on a +/- 45 degree coverage from the speaker and listener ear heights using 1.5 metre for a standing and 0.6 m for a seated listener.

| Approximate speaker spacing by ceiling height | | |
|---|-------------------|-----------------|
| Ceiling Height | Standing Listener | Seated Listener |
| 2.4m Ceiling height | 1.7m | 2.8m |
| 3.0m Ceiling height | 2.9m | 4.0m |
| 3.6m Ceiling height | 4.1m | 5.2m |
| 4.2m Ceiling height | 5.3m | 6.4m |

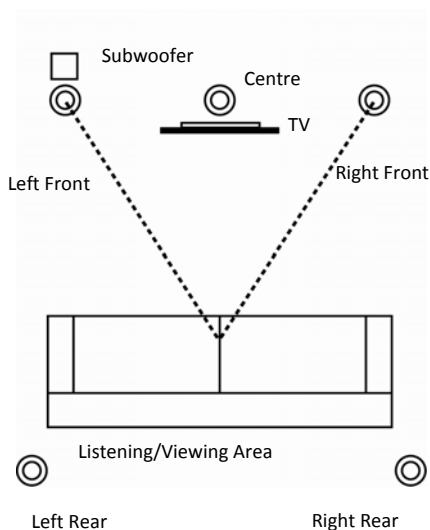


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When connecting more than one pair of speakers to an amplifier it is vital to ensure that impedances are matched. Your amplifier will specify an impedance range with which it can handle and you must ensure you do not drop the total impedance below the minimum level or you may damage your amplifier. Conversely if the total impedance is too high, sound quality will be adversely affected. If in doubt you should consult a professional installer or contact BluCube directly before commencing installation.

As an example, a typical amplifier may specify an operational acceptable impedance range of 4 to 8 ohms. If you connect two pairs of BluCube Loudspeakers (set to 8 ohm impedance on the circuit board) in parallel, the impedance you will present to the amplifier is 4 ohms. This is within limits. If you connect them in series, you will present 16 ohms resistance to the amplifier which will have a negative effect on sound quality.

Home Theatre (Dolby 5.1)Layout



If you switch the impedance of your BluCube loudspeakers to 4 ohms and connect two of them in parallel, then the impedance will be 2 ohms and may damage your amplifier. If they are connected in series, the impedance will be 8 ohms and therefore within acceptable limits.

Please note that, much like attaching a trailer to the back of a car, attaching a second set of speakers to an amplifier will put additional load on the amplifier (or engine). This makes it work harder for the same performance or it may simply not have the power to perform at all. You need to check the capability of your chosen amplifier before tackling this.

Home Theatre Placement

When using the speakers as rear channel speakers in a home cinema environment, they should be ideally located between 0.4 to 1.8m behind the main listening position. They should be separated approximately 1.8m to 3.0m apart.

Wire Gauge and Quality

A good rule of thumb to consider when installing speakers is that the total wire resistance should be less than 10% of the speaker impedance. If using an 8 ohm speaker, your wire resistance should therefore be no more than 0.8 ohms.

The resistance of any wire is directly proportional to its length. So if you double the length, you double its resistance.



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Additional resistance has an increasingly negative effect on sound quality of a speaker. The sound becomes less dynamic, the definition of the bass frequencies can be reduced and, in more extreme cases, the high frequencies can be attenuated. Amplifier power is wasted in the wire, reducing the maximum power output of the system.

You may find the following chart helpful when deciding on the appropriate wire gauge for your installation.

| Wire resistance (Ohms) versus length of cable run | | | | | | |
|---|-----------------------|------|------|------|------|------|
| Wire Gauge | Cable Length (metres) | | | | | |
| | 15m | 30m | 45m | 60m | 75m | 90m |
| 20 gauge | 0.86 | 1.73 | 2.59 | 3.45 | 4.32 | 5.18 |
| 18 gauge | 0.65 | 1.30 | 1.94 | 2.59 | 3.24 | 3.89 |
| 16 gauge | 0.43 | 0.85 | 1.28 | 1.71 | 2.14 | 2.56 |
| 14 gauge | 0.27 | 0.54 | 0.81 | 1.08 | 1.35 | 1.62 |
| 12 gauge | 0.17 | 0.34 | 0.51 | 0.68 | 0.85 | 1.02 |
| 10 gauge | 0.11 | 0.22 | 0.33 | 0.44 | 0.56 | 0.67 |

Running Speaker wires

Each BluCube loudspeaker will require a separate two-core speaker cable run from the speaker to the chosen location of your amplifier. In the case of the CXC-650-S (a single-stereo loudspeaker incorporating both left and right channels) you must treat this as a pair and run two 2-core speaker cables from the speaker to the amplifier.

Running cables during a renovation or a new construction project is obviously more straightforward than running cables after decoration has been completed. Here are some thoughts on how to make the wiring easier and most discrete.

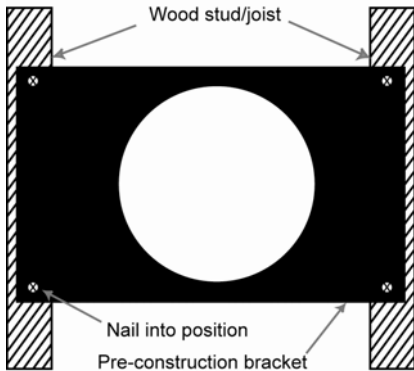
Are you using a regular infra-red controlled amplifier?

An infra-red controlled amplifier requires line of sight between the infra-red remote control and the infra-red receiver. This means the amplifier needs to be on display or an infra-red extender needs to be used to relay the infra-red signal to the amplifier. The location of the amplifier in this case is determined by the control system and is thus less flexible in terms of the cable runs.

Are you using a wireless-controlled amplifier?

If you use a system such as Sonos[®], that uses wireless technology for remote control and audio distribution, you can position the amplifier in a location that minimises cable runs as well as the disruption to the decor of your property. For example, in the case of Sonos[®], you could locate the amplifier in a cupboard, adjacent room, or even the attic. This is because the amplifier does not need to be visible in order for it to be controlled as it is controlled and receives the audio content wirelessly. For more information visit www.blucubespeakers.co.uk/sonos.





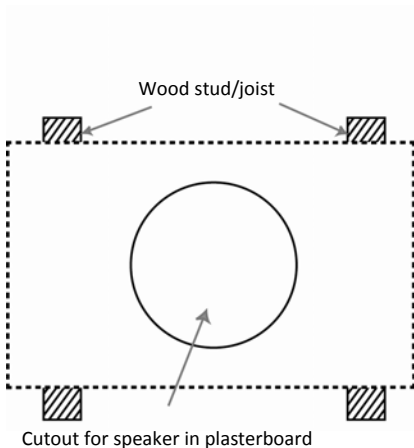
Installing your loudspeakers during a new construction/renovation

If you are installing your flush-mount BluCube loudspeakers during a renovation or new construction, you will probably have the benefit of exposed joists, ceilings and stud walls. This makes the running of the speaker cables very much more straightforward.

The mounting surfaces used should be at least 10mm thick to ensure safety and speaker stability.

Your BluCube loudspeakers come with pre-construction brackets. These can be optionally used to assist with installation. They can be nailed or stapled between the joists or studs in the planned speaker position with the flange of the speaker cutout facing out.

As the plasterboard is fitted you will find it easier to accurately cut out the necessary hole for your BluCube loudspeaker reducing installation time and debris when the speakers are being fitted.



Installing your loudspeakers in an existing construction

If you are installing your flush-mount BluCube loudspeakers after a renovation or new construction has been completed, installation may be a little more challenging as you may have to fish cables to minimise any disruption to the decor of your home.

Note: *Wirelessly Controlled amplifiers. The use of wireless amplifiers (such as those found in the Sonos® Music System) will greatly assist the installation of flush-mount speakers in homes where construction is already completed. For instance, if you are wishing to install your BluCube loudspeakers in upstairs rooms, consider whether the attic space is a suitable location for your amplifier. This would greatly reduce the cable runs required and almost certainly avoid redecoration needs. Alternatively, consider whether the cables may be run across the attic and down into an adjacent room.*

If you wish to install your BluCube loudspeakers in downstairs rooms, identify their desired positioning and consider what room is above this location. For instance, maybe it is a bedroom and maybe it is possible to lift the carpet and floorboards to access the void and hence to enable the cable runs to the speakers below. It may then be possible to locate the amplifier conveniently in the room above

The benefit of using wireless technology in this context is the ability to locate the amplifiers in locations that will minimise the need for disruption to and redecoration of the wall or ceiling surfaces. For more information visit:

www.blucubespeakers.co.uk/sonos.



When installing in an existing construction, take care not to cut through any existing wiring or plumbing.



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The first step in installing flush-mount loudspeakers in a pre-existing construction is to establish the location of the ceiling joists or wall studs. You may be able to do this by lifting upstairs floorboards or stud finding tools. If not, you may need to make pilot holes and a probe but recognise this may entail making good afterwards.

Once a suitable location is identified, you will need to cut out the correct size opening in the surface of the plasterboard using the supplied cut-out template and a padsaw. You should make a pilot hole first and take care not to cut into pre-existing electrical cables or pipe-work.

You will need to run speaker cable from the opening back to the amplifier (in the case of the Single-stereo model CXC-650-S you will need two cables). Ensure you comply with any building codes that may apply in your location.

Fitting the speaker into the cut-out opening

Before inserting the speaker into the opening in the wall/ceiling, attach the speaker cable(s) to the speaker, taking utmost care to ensure the correct polarity of the speaker wires as this is critical to the correct operation of the speakers.

Insert the speaker housing into the opening and tighten the mounting screws to engage the “swing-dog” fasteners. Be careful to not over-tighten. The “swing-dog” fasteners will clamp the speaker frame and the mounting surface together.

To insert the speaker grille, start on one edge and slowly work your fingers around the grille edges to ease into the groove. Make sure all edges are in the groove before applying pressure to insert. It is a snug fit. Do not push on the centre of the grille. If the grille is not going in, it means that not all edges are in the groove. Ease the grille off and start again.

If the grille needs to be removed, use the supplied finger hook tools to gently ease it out of the housing.



Painting the speakers and grilles.

Both the speaker frames and the grilles can be painted, if desired. We recommend doing this before installation to avoid a paint scar or meniscus forming around the frame edge. If the speaker frame is painted after installation, use the supplied paint mask to protect the speaker drivers during painting.

Always paint the grilles separately from the speaker itself. The grilles should only be spray painted and with the use of thinned paint to avoid clogging of the fine mesh of the grille. Thin the paint with 5 parts thinning agent to 1 part paint.

Only install the speakers and grilles once the paint has dried thoroughly.

Single-Stereo (CXC-650-S) model

The 650-S model uses the same installation procedure as other models but needs two speaker cables as it produces both left and right channel audio signals from one speaker housing. It is ideally suited to smaller rooms such as bathrooms. The crossover circuit board on the speaker features two sets of push-to-connect terminals and it is essential that the correct polarity of the connections to your amplifier is maintained. If the sound from the speaker lacks definition, it is highly likely the polarity is incorrect. It does not matter which speaker terminals are connected to the left or right channel on your amplifier, but the correct polarity is critical.

Setting the Tone Control

Blucube CX-series loudspeakers feature baffle-mounted level controls for both bass and treble frequencies. The level control will help you to fine-tune the performance of the crossover to meet any demanding room acoustic issues or listener preferences.

Each level control adjusts an octave wide band of frequencies most affected by the interaction between the drivers. The controls can be adjusted to provide 3dB of boost or 3dB of reduction on each of the drivers in any CX-series loudspeaker.

The level controls are able to help you maximise sound quality regardless of room setup and speaker placement.

Adjusting your speakers

Note: Do not apply pressure to the tweeter dome itself. The pivoting tweeter can be used to direct sound towards or away from a listening area. To pivot the tweeter, apply light pressure to the plastic ring around the outside edge of the tweeter.

If your speakers are widely separated and the music fails to blend into a central image when the system is operated in stereo mode, you should orientate the tweeters toward the listening area.

If you are using your BluCube loudspeakers in a home theatre environment, you can point the pivoting tweeter towards a wall or window to create a diffuse surround effect.



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BluCube® CX-Series Specifications

CXC-650 6.5" 2-Way Circular Flush-Mount speaker

| | |
|-------------------------------------|---|
| Woofers: | 6.5" woven Kevlar cone, rubber surround, 22oz magnet, bumped back plate, 1" voice coil, vented pole piece |
| Tweeter: | 1" Titanium Dome Tweeter, Ferro-fluid cooled, Neodymium magnet, 30° swivel & pivot |
| Crossover: | FR4 board, 18dB per octave for both woofer and tweeter sections, Polyimide auto-protective reset switch for tweeter, 16AWG wire connection to woofer section, gold plated terminal posts will accept 14AWG wire |
| Attenuation Switches: | ± 3dB on woofer and tweeter |
| Frequency Response: | 45Hz – 22KHz |
| Sensitivity: | 88dB 1W/1M |
| Recommended amplifier power: | 10-125 watts per channel |
| Impedance: | 4 / 8 ohm switchable on PCB |
| Cut-out size: | 7.95" (200mm) |
| Depth behind surface: | 4.0" (100mm) |
| Weight (pair package): | 12 lbs (5.7 kg) |
| Dimensions (pair package): | 10.7" (H) 10.4" (W) 15" (L) (26.9 x 26.1 x 37.6 cm) |

CXC-800-3 8.0" 3-Way Circular Flush-Mount speaker

| | |
|-------------------------------------|---|
| Woofers: | 8.0" woven Kevlar cone, rubber surround, 25oz magnet, bumped back plate, 1.25" voice coil, vented pole piece |
| Midrange: | 3" woven Kevlar cone, rubber surround |
| Tweeter: | 1" Titanium Dome Tweeter, Ferro-fluid cooled, Neodymium magnet, 30° swivel & pivot |
| Crossover: | FR4 board, 18dB per octave for both woofer and tweeter sections, Polyimide auto-protective reset switch for tweeter, 16AWG wire connection to woofer section, gold plated terminal posts will accept 14AWG wire |
| Attenuation Switches: | ± 3dB on woofer, midrange and tweeter |
| Frequency Response: | 40Hz – 22KHz |
| Sensitivity: | 89dB 1W/1M |
| Recommended amplifier power: | 10-150 watts per channel |
| Impedance: | 4 / 8 ohm switchable on PCB |
| Cut-out size: | 9.5" (23.9 cm) |
| Depth behind surface: | 4.72" (11.8 cm) |
| Weight (pair package): | 16.75 lbs (7.6 kg) |
| Dimensions (pair package): | 13.0" (H) 12.2" (W) 17.4" (L) (32.6 x 30.6 x 43.7 cm) |

CXC-650-S 6.5" Single-Stereo Image Circular Flush-Mount speaker

| | |
|-------------------------------------|---|
| Woofers: | 6.5" woven Kevlar cone, 22oz magnet, bumped back plate, dual 1" voice coil, vented pole piece |
| Tweeter: | Dual 19mm Titanium Dome Tweeters, Ferro-fluid cooled, Neodymium magnet, 30° swivel & pivot |
| Crossover: | FR4 board, 18dB per octave for both woofer and tweeter sections, Polyimide auto-protective reset switch for tweeter, 16AWG wire connection to woofer section, gold plated terminal posts will accept 14AWG wire |
| Frequency Response: | 45Hz – 22KHz |
| Sensitivity: | 88dB 1W/1M |
| Recommended amplifier power: | 10-100 watts per channel |
| Impedance: | 8 ohm per channel |
| Cut-out size: | 7.95" (200mm) |
| Depth behind surface: | 3.82" (96.0mm) |
| Weight (single package): | 6.5 lbs (3.0 kg) |
| Dimensions (single package): | 8.0" (H) 11.0" (W) 11.0" (L) (20.1 x 27.6 x 27.6 cm) |



Warranty

BluCube warrants this product to the original purchaser to be free from defects in materials and workmanship (subject to the terms set forth below), for a period of five years from the date of purchase. BluCube will repair or replace (at BluCube's option) this product or any defective parts (excluding electronics and amplifiers) in this product. For products that have electronics or amplifiers, the warranty on those parts is two years from the date of purchase.

Your authorised BluCube dealer will inspect the product and, if your dealer is not equipped to perform the repair of your BluCube product, they will replace your product or return it to BluCube for repair, at their discretion. Proof of purchase in the form of a receipted invoice, which is evidence that this product is within the warranty period, must be presented to obtain warranty service.

This warranty is invalid if the factory applied serial number has been altered or removed from this product. This warranty is invalid if this product was not purchased from an authorised BluCube dealer. Cosmetic damage or damage due to accident, acts of God, misuse, abuse, negligence, commercial use, or modification of, or to any part of the product are not covered in this warranty. This warranty does not cover damage due to improper installation, maintenance or operation, or any repair attempted by anyone other than BluCube or a BluCube authorised dealer. Any unauthorised repairs will invalidate the warranty.

Warranty Registration

To register your BluCube product for warranty purposes, please email the following information to: **warranty@blucubespeakers.co.uk**

- Serial number of the product
- Your name and address
- The date and the retailer from where your purchase was made

Alternatively, if you prefer, you may post the above information to us at:

BluCube Loudspeakers

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