

KEF REFERENCE SERIES

MODEL 101/2

MODEL 102/2

INSTALLATION MANUAL



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## MODEL 101/2 & MODEL 102/2

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## 1.0 INTRODUCTION

KEF Reference Series Models 101/2 and 102/2 are compact speaker systems, both designed to operate against a wall or on a shelf, and both incorporating a 160mm Uni-Q driver with 19mm ferrofluid cooled tweeter. Either may be used with the optional KUBE 200 equaliser to enhance low-frequency performance and increase their versatility.

### Model 101/2

Model 101/2 makes an ideal high-quality speaker for a small system or where space is limited, and a near-perfect second or 'dialogue' speaker for use in surround-sound or multi-room applications, where its 'boundary' balance is a positive benefit. Compatibility with KUBE 200 means that it may be used in another room as extension to a main system including, say, 105/3 and KUBE 200. 101/2's single Uni-Q driver allows it to be placed vertically or horizontally on a bookshelf without detriment to response.

### Model 102/2

This is an entirely new compact three way single coupled cavity speaker. The cabinet is the same width and depth as 101/2, but is 170mm (6.75") taller. The enclosure contains a 160mm Uni-Q unit similar to that used on 101/2 together with a 160mm paper cone/foam surround bass unit mounted inside the cabinet, venting through a contoured port on the front baffle below the Uni-Q driver.

Whilst the overall response and sound characteristics of the two models are similar, Model 102/2's 3-way single coupled cavity design combined with higher sensitivity gives increased power handling and greater output capability.

### The Uni-Q Driver

This is a radical KEF development, which realises the long held ambition of loudspeaker designers to create a drive unit where all the sound appears to radiate from a single point source. The use of a newly-discovered magnetic alloy, Neodymium-Iron-Boron, which has ten times the energy product of conventional ferrite, enables a tiny tweeter assembly to be made small enough to be placed inside the bass unit's voice coil, precisely where the acoustic centres of the two drive units coincide. This creates a full-range coincident drive source, matched in time, space and directivity.

With Uni-Q, discontinuities in the crossover region are eliminated. The matched directivity of tweeter and woofer means the effects of room reflections are minimised because the sound reaches the listener in phase. Clarity and stereo imaging are greatly improved.

The symmetrical nature of Uni-Q means that its dispersion is equally good in both the vertical and horizontal planes, making it ideal for compact speakers. Never before has KEF's Total System Design philosophy been so thoroughly validated - a totally integrated approach where the critical

elements of drive unit, enclosure and filter network are studied and developed together to achieve the intended response.

Model 101/2 incorporates a newly-developed third order low-frequency shelving alignment. This response shape is derived from the speaker's measured mean forward hemispherical response. When correctly placed close to a wall, the speaker gives a more accurate and extended bass response.

Model 102/2 uses a singled coupled-cavity band-pass arrangement, giving higher efficiency and power handling, whilst still designed for boundary placement.

Both speakers may be used in non-boundary placement - on a stand, away from the rear wall. Model 101/2 should only be used in this way with KUBE 200. If bi-amped, with or without KUBE 200, the input level to the low-frequency section of Model 102/2 may be increased to compensate for the reduced boundary reinforcement. If used with KUBE 200 single-amped, the LF Contour control will provide additional bass level for either model.

Models 101/2 and 102/2 are pair-matched to KEF Reference Series standards - ie less than 0.5dB difference in response between the speakers in a pair. Both have baffles computer-routed from solid MDF, painted dark grey, with a single 160mm Uni-Q unit flush rebated into the baffle and fitted with a moulded trim ring. A lightweight moulded grille frame is held in place by high-strength magnets. With grille removed there are no fixings visible for grille or driver. The badge may be rotated to suit vertical or horizontal placement.

## 2.0 INSTALLATION

### 2.1 UNPACKING, HANDLING AND AFTERCARE

Unpack the speakers and retain the packaging in case you need to transport the speakers at a later date.

#### Aftercare

Your loudspeakers are supplied in matched pairs of real wood veneer cabinets. The cabinets should be treated with the same care with which you would treat fine furniture, and the use of a good quality wax polish is recommended.

It is normal for walnut cabinets to darken and rosewood to lighten with the passing of time, but locations in direct sunlight should, if possible, be avoided.

## 2.2 SPEAKER POSITIONING

Models 101/2 and 102/2 are designed to be used either on a shelf, or on a stand against, or close to, a rear wall. The bass reinforcement which normally occurs when conventional speakers are placed in such a position is taken account of in the design of the loudspeakers' bass response characteristics. The sound balance will lack bass if the speaker is positioned away from the wall, in free space. Correct system balance will be achieved with the speaker close to the rear wall, just how close must be a matter for experimentation.

The height of the shelf or stand should be chosen so as to position the centre of the Uni-Q drive unit at a similar height to the ears of a seated listener. This height is not critical, 300mm (12") above or below ear height will normally suffice.

If used on bookshelves, the front of the speaker should be level with, or project slightly (25mm, 1") forward from the front edge of the shelf. Avoid having nearby books or other items projecting further forward than the loudspeaker.

Model 101/2 and 102/2 may be placed horizontally if required, without degrading the speakers' sound quality. At any given off-axis angle the Uni-Q drive unit's response is the same in all directions. Thus the speaker may be used vertically, horizontally, or indeed at any angle in between, yet will sound the same. This greatly increases its versatility and ease of use, particularly if Model 101/2 is used in a secondary role in a distributed sound system or for surround sound applications. If the speaker is used on its side, the badge may be realigned by pulling forward, rotating through 90° and replacing it.

If the speakers are to be used on stands, these should ideally be stationed at least 1m (36"-39") from the side walls. The stand should be of rigid construction, heavy, and firmly in contact with the floor, preferably using hard feet or spikes. Stability is essential, particularly if placed on thick carpet.

A rigidly-sited speaker performs better than one which can move because it allows the cabinet to remain fixed while the drive units are allowed to move as determined by the signal. Even seemingly insignificant movement can affect the sound. (In a perfect speaker, the drivers are the only moving parts). The audible gains include better control of the positioning of the sounds, with 'images' which occupy a specific space, and a reduction in 'smearing', which can affect the quality of the musical notes' attack and decay. This is especially noticeable when the notes should have a crisp, sharp beginning and ending.

Where the speakers are located is just as important as how they make contact with the floor. The tonal quality and the clarity of the sound, as well as the sharpness of the image, is determined as much by the sound reaching the listener indirectly, as it is by the sounds which emanate in a forward pattern. The indirect sounds reach your ears by reflecting off walls, the floor and the

ceiling; these reflections are the sounds which give different concert halls their individual characteristics, and make every listening room sound different. It is also why there are no hard-and-fast rules for speaker positioning, only guidelines for the user to adapt to his or her own set of circumstances, since all loudspeakers interact differently with all rooms.

In Models 101/2 and 102/2 KEF has addressed these questions in a number of ways, including the size and shape of the front panel, the cabinet dimensions, and physical construction and other methods which shape the performance in ideal conditions. As previously noted, Models 101/2 and 102/2 will perform optimally in the 'real world' environment of the domestic living room, with the speakers situated at least 1m (36"-39") from the side walls and close against the back wall. The speakers will also operate best if nothing is placed between them and the listener.

Also important are two other positioning considerations; the distance between the speakers and the distance between the listener and the speakers. Stereo imaging is created by reproducing two separate signals in a space in front of the listener. If the speakers are too close together, the stereo 'width' cannot be reproduced faithfully; in extreme conditions, it can result in a sound virtually indistinguishable from single-channel ('mono') sound. How far apart the speakers are placed is determined by room size, but as a guide, KEF recommends a spacing of between 2m (6') and 4m (13') apart. At the other extreme, speakers placed too far apart will yield sound with a 'hole in the middle' instead of a coherent, spread of music. With Uni-Q there is no need to listen precisely "on-axis" and therefore there may be no need to toe-in the speakers so that they aim towards the listening position (See 2.5). The Uni-Q driver produces a smooth off-axis response, with room reflections less of a problem than with conventional speakers. (See section 3.0. Use with optional KUBE 200 equaliser).

The listener's distance from the loudspeaker should be equal to or slightly greater than the distance between the speakers, creating an equilateral triangle. You can test this quite simply with both music and speech by moving your chair closer to or away from the speakers until the sound best suits your tastes. When doing this, make certain that the playback levels are the same as you would use for normal listening.

## 2.3 SPEAKER CONNECTIONS

(NOTE: All connections should be made with the equipment switched OFF. Only switch ON once the connections have been made and are secure.)

To account for the variety of connectors in use today, a number of options are made available. The terminals fitted will accept either bare wire, 4mm 'banana plugs' or 6mm spade connectors. Each type of termination has its own virtues; the fitting of a universal terminal allows you to use your existing leads without the need to fit a different connector.

Common to all types of connector is the need to make certain that the correct wire is connected to the correct terminal to maintain 'polarity'. Each speaker takes two wires from the amplifier, with one marked '+' or 'positive' or coloured RED, while the second is marked '-' or 'negative' or BLACK. For both left and right speakers, make certain that you always connect amplifier '+/positive/RED' to loudspeaker '+/positive/RED' and amplifier '-/negative/BLACK' to speaker '-/negative/BLACK'. Most cables will have some indication (eg colour-coding, printing or a stripe) on one of the two wires to allow you to trace them accurately; additionally, fitted connectors may be coloured RED or BLACK to aid in correct installation.

Bare wire connections are the most popular and involve stripping 12.5mm (½") of insulation to expose the speaker wire core. If your wire is a 'multi strand' type, twist the strands tightly together with clean fingers to prevent oils from affecting the contact. Having unscrewed the terminal cap, push the wire through the exposed hole in the terminal and screw the cap down tightly. Make sure that no stray strands make contact with the other terminal; this could cause a short circuit between the two terminals.

If 4mm 'banana plugs' are employed, always select a good quality sprung or expanding type. This will ensure that the plug fits tightly into the socket. These are simply inserted in the large hole at the top of the terminal. Spade (U-shaped) connectors should be placed around the exposed pillar seen when the cap is unscrewed. As with bare wire connections, screw the cap tightly in place.

The importance of clean, tight connections cannot be over-emphasized, as this affects both sonic quality and actual operation. A loose connection can eventually lead to disconnection, while dirty contacts can impair the signal quality. It is therefore recommended that you occasionally remake all connections to confirm their integrity. In the case of bare wire connections, cut off the old, exposed wire and strip back the insulation to reveal fresh wire. Twist the newly-exposed strands and re-connect the cables to the terminals.

These speakers also feature an additional pair of terminals to allow the speaker to be operated in two other modes. In both cases, the gold strip linking the two sets of terminals should be removed by unscrewing the upper terminals completely, loosening the lower terminal screws, and removing the link upwards.

The first mode, BI-WIRING, involves connecting two sets of wires from the amplifier to the speakers. (Your amplifier may include either single terminals, in which case both wires are connected to the same terminal at the amplifier, or it may offer two sets of terminals, one for each set of wires). This separates the mid and high frequency sections of the loudspeakers from the low frequency section for gains in clarity and quality.

The other mode, BI-AMPLIFICATION, allows the user to employ two separate amplifier, one for the mid and treble frequencies and one for the low frequencies. This imparts even greater control

as it provides a 'dedicated' amplifier for each section of the speaker. One set of cables runs from each amplifier to each pair of terminals on the speaker. Again, make certain that the polarity has been maintained as above. (NOTE: It is recommended that, when BI-AMPLIFYING, you use the same make and model of amplifiers for mid/high frequency and low frequency to ensure consistency in terms of playback levels and polarity. If you wish to mix amplifier types, please consult your dealer concerning their suitability (See section 3.0).

To check the polarity of your system, place the two speakers together, facing each other about 5-7.5cm (2-3") apart. Play a recording which has plenty of deep bass, such as an organ solo. Operate both speakers with your amplifier switched to 'mono'. Reverse the connections on ONE SPEAKER ONLY and repeat the test. Correct polarity is indicated by firm, full bass, while incorrect polarity will create weaker bass.

KEF also suggests the following when connecting your loudspeakers:

Always try to keep the length of cable from amplifier to speakers as short as possible to minimise power and frequency losses. Although the choice of speaker cable is not critical with KEF loudspeakers because of the easy load they present to the amplifier, nevertheless you may wish to investigate the specialist cables available from your KEF dealer. Many listeners feel that such cables can be used to 'fine-tune' the sound. Your dealer will be able to recommend suitable cables.

Always use cables of equal lengths to both speakers even if the actual distance from your amplifier to the loudspeakers differs from one side to the other. Excess cable can be folded neatly in concertina fashion and secured with a cable tie or elastic band.

## 2.4 AMPLIFIER REQUIREMENTS AND POWER HANDLING

To ensure that your speakers will work well with a wide range of hi-fi components, they have been designed to deliver adequate listening levels with moderate amounts of power. As a minimum, KEF suggests that you can operate your Model 101/2 or Model 102/2 with an amplifier rated as little as 30 or 20 watts per channel into a 4 ohm load respectively. Both speakers can, however, achieve much higher volume levels cleanly and without damage. For use in larger rooms or for high level playback, amplifiers rated at up to 150 watts per channel into 4 ohms (typically 100-125 watts into 8 ohms) may be utilised.

Amplifier requirement figures are intended only as a guide. As a general rule, buy the biggest amplifier you can afford within the specified range and use it with care. Remember it is always just as easy to damage the loudspeaker by using a small amplifier driven into distortion by too much volume possibly with bass and treble boost, than by using a larger amplifier which has power in reserve. If in doubt, ask your dealer.

If you are about to purchase a new amplifier, KEF recommends that you audition your potential purchase with the speakers of your choice before you buy.

## 2.5 SYSTEM FINE-TUNING

Although KEF Reference Series speakers are always designed for easy general installation and system matching, any speaker's performance can be finely tailored to an individual room. Experienced listeners are able to detect small sonic changes which can affect the overall performance; these small changes can be introduced by seemingly insignificant adjustments in the speakers; positioning, changing types of cables, removing the speaker grille cloths during listening sessions and so on. Far from being 'black magic', such attention to detail can enhance the performance of a hi-fi system in known, audible ways.

The secret to successful fine tuning is knowing how to listen. As with any pursuit, experience is the best qualification. You will soon find out that your own listening habits and abilities improve as you grow more and more familiar with the sound of your hi-fi. Your favourite recordings hold the key to successful fine-tuning.

Once you have installed your speakers according to the instructions in Sections 2.2 and 2.3, you can go a stage further by repositioning the speakers by small increments. One known phenomenon related to speaker positioning is the way that bass can be augmented by placing it closer to the back or side walls. The adverse effects resulting from positioning too close to the boundaries include an imbalance created by having too much bass relative to the rest of the sound spectrum. This performance as explained earlier, is already catered for in the design of Models 101/2 and 102/2. You will still find however, that the sound can be finely adjusted by changing the distance between the wall and the back of the speaker. As you can see, such fine-tuning is a case of making an adjustment, listening, making another adjustment and so on, until you reach a point where the sound 'snaps into focus'. As you continue, you may notice a point where the sound starts to lose its quality; you then simply move back to the previous adjustment.

Stereo imaging is also affected by aiming the speakers toward the listener, pointing inward; this is called 'toe-in'. In most situations, and especially in large rooms, the speakers are likely to be placed with the back of the speaker parallel to the back wall, firing forward. Slight toe-in may improve focus, but it will also restrict the area for ideal listening. In some instances, this creates what is referred to as a 'hot seat', which means that the best sound is available to only one or two listeners sitting at the precise location in front of the speakers.

Your speakers feature a carefully designed grille covering which serves two primary functions. On a most basic level, grille cloths protect the drive units from dust and damage, while on an aesthetic level they soften the look of loudspeakers. Some listeners, however, believe that the presence of a grille cloth between the drive units and the listener will act as a 'filter' on the sound, possibly affecting the upper frequencies and 'openness'. The grilles are removable and may be taken off during concentrated listening periods. KEF does recommend, however, that they be left

in place at all other times. The grilles on Models 101/2 and 102/2 are held in place by concealed high-strength magnets. To remove, pull the grille forward from the top and lift upwards. To replace, locate the two tabs at the bottom of the grille into the slots provided, and release the grille top - magnetic attraction will do the rest. With the grille removed, no fixings are visible, for grille or drive unit.

In Section 2.3, mention is made of the use of specialist cables. Critical listeners may find that gains are to be made by selecting a specialist cable which can optimise the relationship between the amplifier and the loudspeaker. General recommendations are not possible in the pages of this manual, other than to advise that you treat the purchase of cables as you would any hi-fi component. You should audition the cables with the components used in your own system. Be guided by your dealer in this respect, and be aware that some specialist dealers are equipped to provide a 'loan' set of leads for home auditioning.

## 3.0 USE WITH OPTIONAL KUBE 200 EQUALISER

KUBE (KEF User-variable Bass Equaliser) 200 is an active low-level bass equaliser which, when connected between pre- and power amplifier, or in a tape monitor or processor loop, provides a number of facilities to extend the use, and enhance the performance, of Models 101/2 and 102/2.

Fixed active equalisation extends the loudspeaker's bass response below its normal, unequalised cut-off. When used with KUBE 200, the bass response of both Model 101/2 and 102/2 is extended to -6dB at 20Hz.

KUBE 200 also provides adjustable equalisation to take account of listening environment, loudspeaker placement, and user preferences in sound balance.

The controls include:

LF Contour to adjust the level of low frequencies (below 160Hz), to control bass/midrange balance, compensating for room boundary effects and standing waves.

HF Contour to adjust high-frequency level (above 1kHz) to take account of reflecting or absorbing surfaces, and of on or off-axis listening positions.

Bypass EQ switches KUBE completely out of circuit, with signal inputs routed directly to the outputs.

Tape Mon replaces the function of the amplifier's tape monitor switch in cases where KUBE is to be connected in the tape monitor loop of an amplifier to which a tape deck is already connected.

Connection facilities include, in addition to Signal In/Out and Tape In/Out, two additional sets of auxiliary outputs, one of which is variable in output level.

Direct is an unequalised output which allows connection of a second power amplifier and speakers, not requiring equalisation, elsewhere in the house. It may also be used to feed a surround-sound system in an audio/video installation.

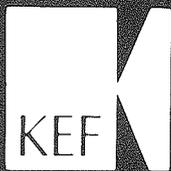
Equalised (variable) allows the connection of a second power amplifier to the main system, for bi-amplification. The variable output level control can be used to compensate for amplifiers having differing input sensitivity or power output, or to drive the LF and MF/HF sections at different levels, as with Model 102/2.

SPECIFICATION

	101/2	102/2
MODEL	101/2	102/2
TYPE	SP3123	SP3124
EFFECTIVE * FREQUENCY RANGE	50Hz - 20kHz, -6dB at 38Hz measured at 2m on reference axis	
MAXIMUM OUTPUT*	106dB	110dB
	on programme peaks under typical listening conditions.	
CHARACTERISTIC SENSITIVITY LEVEL *	86dB spl	89dB spl
	at 1m on reference axis for pink noise input of 2.83Vrms band limited 50Hz-20kHz (anechoic conditions)	
AMPLIFIER REQUIREMENTS into 4 ohms	50-150W	50-200W
IMPEDANCE	4 ohms	
INTERNAL VOLUME	10.3 litres 628 cu in	LF 16.2 litres 988 cu in MF/HF 1.25 litres 76 cu in
NET WEIGHT	7.2kg 15.8lb	11kg 24.2lb
DIMENSIONS h x w x d	330 x 215 x 262mm 13 x 8½ x 10³/8in	500 x 215 x 262mm 19⁵/8 x 8½ x 10³/8in

\* Corrected for wall or shelf placement

Part No: PL700EN01 (Prov)



**KEF ELECTRONICS LTD., Tovil, Maidstone, Kent ME15 6QP.**  
**Telephone: (0622) 672261. Telex: 96140. Fax: (0622) 750653.**  
**Distributed in the U.S.A. by: KEF Electronics of America Inc.,**  
**14120-K Sullyfield Circle, Chantilly, VA22021.**  
**Telephone: (703) 631 8810. Telex: (510) 100 2304. Fax: (703) 830 7625.**

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