

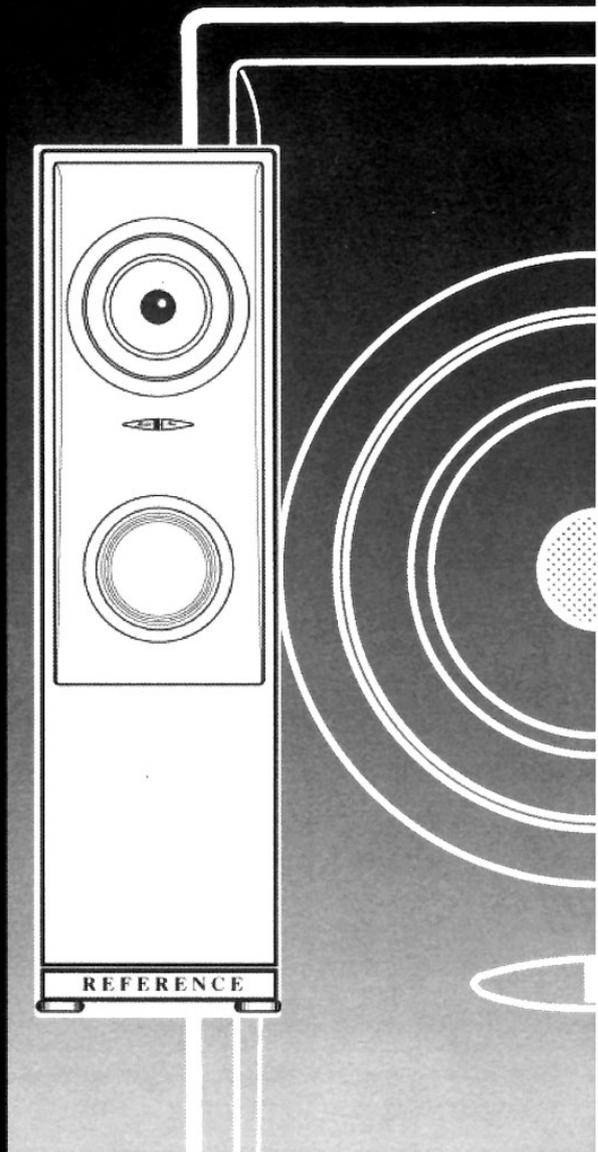
# *Reference Series*

■  
*Model One*

■  
*Model Two*

■  
*Model Three*

■  
*Model Four*



**Installation Manual**



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**Thank you for purchasing KEF Reference Series loudspeakers. These have been designed to faithfully reproduce high quality sound over many years of use and should provide realistic reproduction of music and speech. Please take a little time to read these instructions prior to use.**

## **1.0 INTRODUCTION**

Since its formation in 1961, KEF has pioneered many innovations in loudspeaker technology and design. Your new Reference Series loudspeakers contain one of the latest of these advances - the KEF Uni-Q<sup>®</sup> Driver.

In this innovative KEF design, not only are the mid- and high-frequency drivers on the same axis (co-axial), but their acoustic centres are also in the same plane (co-planar). The profile of the mid-frequency driver's cone modifies the directivity factor (or 'Q') of the high frequency unit such that both drive units have the same directivity in the critical crossover region, where both drive units are operating at similar frequencies. This unification of the 'Q' of the drive units lies behind the name "Uni-Q".

Now incorporated in many KEF loudspeakers, the Uni-Q driver yields immediate and readily audible sonic benefits. With no sharp discontinuity in 'Q' at the crossover frequency, correct tonal balance is not confined to a single 'sweet spot' in the listening room and is extended to cover a far broader area. With sound arriving in phase, the sound source is brought into the sharpest possible focus. With properly recorded material and as part of a good quality system, well set-up, loudspeakers with KEF Uni-Q can reveal the location of each musical voice in the stereo image with pin-point accuracy and with a much smoother response being maintained off-axis - where most people listen - than before.

### **1.1 Overview of Common Features**

The KEF Reference Series products covered by this manual are floorstanding loudspeakers designed to operate away from room boundaries. All use Reference matched drive units and crossovers that have been manufactured to laboratory-standard and rigorously tested at every stage of production. The driver complement of each system reflects the increasing performance capabilities of each model, particularly its ability to reproduce increased levels of low frequency and high-dynamic mid-frequency output.

On all these models, mid- and high-frequencies are reproduced by a single Uni-Q driver incorporating a 160 mm (6 1/2") mid-frequency drive unit and a 25 mm (1") fluid cooled, soft-dome, high-frequency unit. These State-of-the-Art components are common to all models on the grounds that clarity and definition of high and mid-frequencies are paramount in a Reference Standard product. The ultimate levels of dynamic range, bass output and maximum sound pressure level available decides which other combination of drive units are used.

Thanks to their internal Magnetic Shielding, these loudspeakers may be used close-to or beside a television set or Video Monitor, when used in front left and right channel positions in Home Theatre or Surround Sound applications.

All models employ front baffles moulded from mineral-filled polymer which conceals the fixings for the drive units. The front baffle also incorporates a smoothly contoured bass-vent through which low frequencies, from the Coupled Cavity chamber, pass.

Models featuring Twin-Coupled Cavity bass loading are fitted with an extruded aluminium Force-Cancelling rod to provide unsurpassed absorption of reflex energy with a commensurate reduction in cabinet colouration.

Gold plated feet, turned from solid brass and carpet piercing spikes are individually adjustable to allow for levelling on uneven flooring.

### **1.2 Model One**

This is a three-way loudspeaker with three drive units, two of which are combined in a single 160 mm (6 1/2") Uni-Q chassis. The third driver is an internal 160 mm (6 1/2") pulp-cone bass unit mounted in an Interported Coupled Cavity band-pass arrangement.

The internal bass unit acts over the range from 50 Hz (-6 dB) up to 140 Hz. The 160 mm (6 1/2") cone of the Uni-Q driver then covers all mid-frequencies from 140 Hz to 2800 Hz, where sound is then crossed over to the 25 mm (1") high-frequency unit which then operates up to 20 kHz.

### **1.3 Model Two**

Model Two is a three-way loudspeaker with four drive units. Two 160 mm (6 1/2") drive units in Twin Coupled Cavity configuration with multiple Interports, handle bass frequencies while the mid-range and high frequencies are handled by the Uni-Q driver.

Frequencies from 20 kHz to 3 kHz are handled by the 25 mm (1") high-frequency unit while the mid-range section of the Uni-Q driver operates over the range from 3 kHz down to 150 Hz. Interported Coupled Cavity bass drivers cover the rest of the operating range.

### **1.4 Model Three**

Five drive units in a four-way configuration are employed in the Model Three. The single Uni-Q driver for upper mid-range and high frequencies, a 160 mm (6 1/2") drive unit for lower mid-range, plus two internally mounted 200 mm (8") drive units for low frequencies.

The 25 mm (1") high-frequency unit functions from 20 kHz down to 3 kHz, while the 160 mm (6 1/2") part of the Uni-Q driver handles mid-frequencies from 3 kHz down to 400 Hz. The additional lower mid-range drive unit handles the range from 400 Hz down to 140 Hz where most musical dynamic energy occurs. The two Interported Coupled Cavity bass drivers cover the lower octaves from 140 Hz to 36 Hz (-6 dB).

### **1.5 Model Four**

A multi-component, high-quality, hand-soldered dividing network and six drive units are utilised in the Model Four. The dividing network has its cross-over points at 2.8 kHz, 500 Hz and 160 Hz and smoothly directs appropriate frequencies to the relevant drive units. The 160 mm (6 1/2") Uni-Q driver used in the other Reference Series speakers is used for upper-mid and high frequencies.

A pair of 160 mm (6 1/2") lower mid-range units fitted within their own individual compartments and two internally mounted 250 mm (10") pulp-cone bass units, mounted in Twin Coupled Cavity band-pass configuration, complete the driver complement within the Model Four.

## 1.6 Input Terminals

Wide entry, gold-plated bi-wire/bi-amping terminals are fitted to the custom-designed moulded terminal assembly at the rear of the speaker cabinet. This allows the use of the many different gauges of speaker cable that are available.

## 1.7 Magnetic Shielding

Each of these Reference Series loudspeakers features magnetically shielded drive units. The magnets of the Uni-Q, mid-range and bass drivers are mounted within steel cans; the bass cans also contain flux-cancelling magnets. This arrangement reduces the external magnetic field around the loudspeakers, virtually eradicating any risk of picture distortion that can be caused by conventional, unshielded loudspeakers. Some television receivers and/or video monitors may be more sensitive to external magnetic fields than others. If in doubt, please consult your dealer.

## 2.0 INSTALLATION

### 2.1 Unpacking, Handling and Aftercare

These Reference Series loudspeakers are packed one loudspeaker per carton. Prior to unpacking, please ensure that the serial numbers of the speakers supplied to you match each other. Then, unpack the speakers carefully and inspect for any visible sign of damage. Your speakers left KEF in perfect condition. If any damage is apparent, you should notify your dealer immediately. Retain the packaging in case a need arises for you to transport the speakers at a later date.

The cabinets are finished in real wood veneer and should be treated with the same care with which you would treat fine furniture. A good quality wax polish is recommended to maintain the original finish and lustre; the surfaces may also be cleaned with a slightly damp, soft lint-free cloth. It is normal for wood veneer to lighten with the passing of time, but locations in direct sunlight should, if possible, be avoided. Furthermore the cabinets should not be allowed to become wet.

Your KEF Reference Series loudspeakers feature a Mineral Loaded Integral Support plinth that is attached to the bottom of the speaker enclosure. This may be removed by unscrewing each of the four cross-headed M6 screws in the base of the support. The internal cavity in the support may then be 'loaded' with a plastic bag filled with lead shot (not supplied). This will provide additional stability for the loudspeaker. **NOTE: This does not apply to the Model Four, due to its greater overall mass.**

Each Reference Series floorstanding loudspeaker is supplied with KEF designed spike/foot assemblies that may be used in one of two ways. As supplied, four gold-plated feet are attached to the bottom of each cabinet. This enables fine adjustment of level, depending on your preferred location of the speakers.

### 2.2 Speaker Placement and Room Acoustics

The listening room is one of the most variable elements in the hi-fi chain and its effect cannot be emphasised too strongly, nor can its effects be reliably predicted. Similarly, the distance between the loudspeakers and their distance from the listener is also critical for correct operation. Spacing the speakers approximately 2 m - 3 m (6' - 10') apart will allow the stereo images to develop fully. You should sit at a distance at least equal to and preferably greater than the distance between the speakers.

Positioning the speaker in a corner or near to a side wall is not recommended as the significant bass boost caused by this position will affect the sound and cause the stereo image to deteriorate. Furthermore, it is best to place the speakers symmetrically within the room, relative to the walls, ceiling and floor, where possible. Be aware also that soft furnishings near to a speaker will deaden the sound - similarly, nearby reflective surfaces may brighten up the sound. These influences can alter the character of perceived sound dramatically.

Noticeable changes can also be made to the sound of the hi-fi system by altering the relative position of the speakers, sometimes by only a few inches. If required, move the speakers until you are satisfied that the sound is right and that the stereo image is well defined.

Like all other KEF Uni-Q loudspeakers, your Reference Series loudspeakers are designed to be used with little or no 'toe-in'. In practice, you should ensure that the rear face of each loudspeaker is parallel to the rear wall.

### **2.3 Adjusting the Feet and/or Spikes**

KEF strongly recommend that you do not attempt to level your speakers single-handed. Recruit the assistance of another adult - or consult your dealer for assistance. The feet are designed to provide small adjustments, not to compensate for seriously irregular floors.

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

Best results will be obtained if the speakers are level and stable. Check the level of the speakers from front-to-rear and then from side-to side using a spirit level, preferably of the type available for levelling turntables that have a bubble within a circle - or one that has two spirit-levels in the same plane, but at 90° to each other. Check the general stability of each speaker by gently rocking each from side to side, front-to-back and diagonally.

If the general stability is good, but the speaker is leaning to left, right, backward or forward, then equal minor adjustments to the two feet opposite to the direction of lean should be made. Often, you will find that the speaker is reasonably vertical, but rocks because one foot (or two feet diagonally) seem too short.

Check this by sliding thin pieces of card under the foot or feet that seem too short, while an assistant tells you the effect of your actions by reading the spirit level(s) on top of the product. Once the speakers are upright and stable, withdraw the packing from under one foot and gently adjust that foot by rotating the gold-plated foot until it makes firm contact with the flooring. Check stability and level with your helper before removing packing from beneath or adjusting any other feet.

You may wish to enhance the performance of the speakers by using the spikes. In this case, unscrew each of the gold-plated feet and remove the threaded screw from the base of the speaker cabinet. A slot is provided in the end of the threaded screw to permit use of a flat-bladed screwdriver - do not use excessive force as you may damage the slot. Once removed, the threaded spikes should be inverted and fully screwed back into the base of the plinth, slotted end first.

Much the same adjustment method applies to spiked feet, except that the gold-plated foot is used as a locking device (except on very deep pile carpet when a separate lock-nut may be required, see note in text). Finger-adjustment of the threaded spiked-foot is less convenient than adjusting the large foot and may require you to lean the speaker in order to lift the spike clear of the floor. It is here that your helper will be invaluable in facilitating a quick and safe result.

The spikes may then be locked in place using the gold-plated feet. This will enable you to get the best performance from the speaker and ensures that the loudspeakers are stable. (In some circumstances, for instance thick pile carpet, it may be necessary to fit an alternative lock nut, of M6 thread (not supplied), instead of replacing the gold foot.)

### **Important Safety Notice**

*Your KEF Reference Loudspeakers are tall, slim and extremely heavy. Installed correctly on a smooth, level surface, your speakers should be entirely safe to listen to and to live with. However, if you have small children, large pets, the infirm, uneven flooring or unusually thick carpeting in your home, then correct adjustment of the foot assemblies is imperative, if safe, stable operation is to be achieved.*

## **2.4 Speaker Cables**

Poor quality cables can seriously affect the overall sound of your hi-fi system. KEF recommends that high quality speaker cable be used for connecting your Reference Series loudspeakers. Increasing the length of the cables can also affect the sound so it is good practice to keep the cables as short as possible. Needless to say, the left and right channel speaker cables should be the same length otherwise there may be a perceptible change in output level between the speakers. The excess cable should be folded neatly, concertina fashion and secured with a cable tie or elastic band. In a high resolution system, speaker cable differences may be detectable. In short, you should buy the best quality cables that you can afford.

## **2.5 Amplifier to Speaker Connections**

All connections should be made with the amplifier switched OFF. Ensure the integrity of all connections prior to switching the amplifier ON.

KEF Reference Series loudspeakers are fitted with purpose designed gold-plated bi-wire/bi-amp terminals which will accept either bare wire, 4 mm 'banana' plugs or spade connectors.

Most good quality speaker cables have some indication, such as colour coding or 'ribbing' on the insulating material, as to which conductor is '+' or positive. Connection to the speakers can then be made as follows:

The left channel amplifier output terminal marked '+' or coloured RED connects to the left speaker terminal marked '+'. The left channel amplifier output terminal marked '-' or coloured BLACK connects to the left speaker terminal marked '-'. Similarly, these instructions should be followed for making connections between the right channel amplifier output and the right speaker.

Bare wire connections are the most popular and involve stripping 12.5 mm (1/2") of insulation to expose the speaker wire core. (You should twist together, using clean fingers, the ends of each multi-stranded core prior to the next stage to ensure a better signal contact). Having unscrewed the lower terminal cap, push the wire through the exposed hole in the terminal body and screw the cap down tightly.

If 4 mm 'banana' plugs are employed, always select a good quality sprung or expanding type, making sure that the cable is properly connected and that the plugs fit tightly into the sockets. These are simply inserted in the large hole in the terminal cap.

*Make sure that no stray strands come into contact with the opposite terminal; this could cause a short circuit between the terminals and may damage your amplifier.*

## 2.6 Bi-wiring/Bi-amping Terminals

The two sets of input terminals are linked by a gold-plated shorting link. Removal of this link will allow the MF/HF and LF sections to be connected separately, either by a parallel connection from one amplifier (known as bi-wiring) or to separate power amplifiers driven from the same pre-amplifier (bi-amping). Please refer to Figure 1 below.

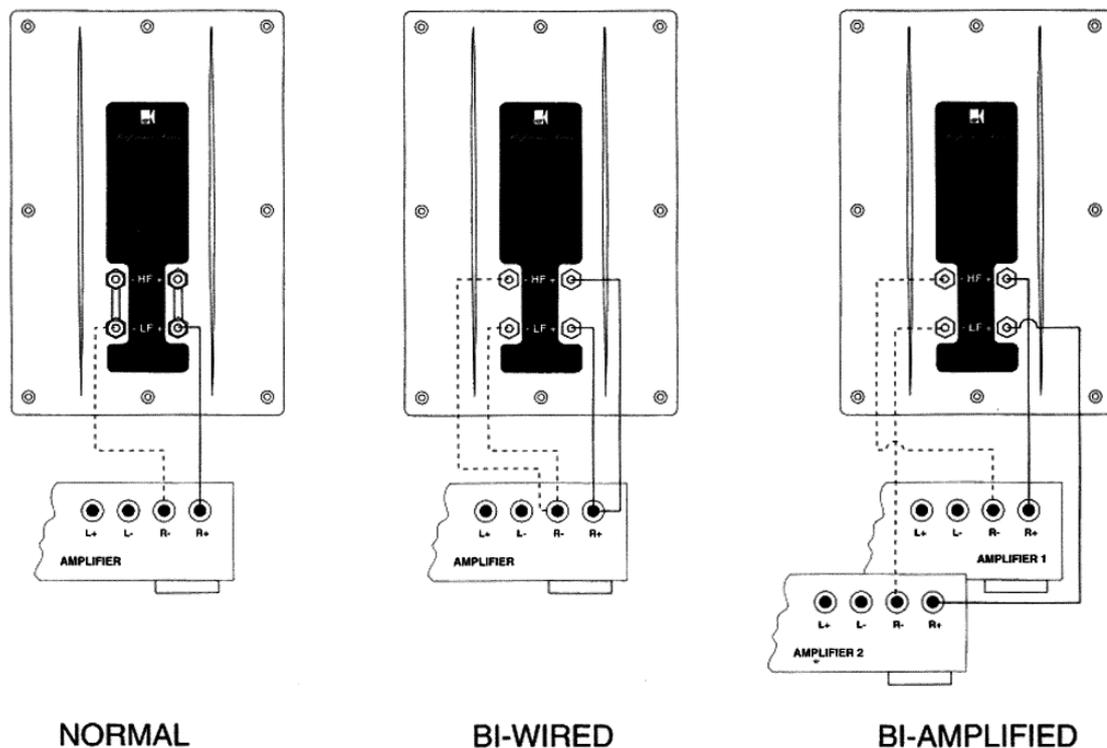


Figure 1 (Only one channel shown)

## 2.7 Speaker Phasing

Correct polarity is vital to the proper operation of any hi-fi system. Once you have made the connections described the sound from your speakers should be as KEF intended them to sound. However, if the stereo image is confused or you feel that the bass sound is weak then you should check the speaker phasing in the following manner:

If the loudspeaker shorting links have already been removed to permit bi-wiring/bi-amping, replace the links and connect one amplifier to each speaker using the lower 'LF' terminals. Place the two loudspeakers about 5 cm - 7 cm (2" - 3") apart and facing each other. Play a recording which has plenty of deep bass such as an organ solo and ensure that both speakers are working correctly (confirm that the amplifier balance control is in the centre position). When both speakers are connected IN-PHASE, you will perceive that the bass sounds full and deep. If the speakers sound weak and thin, switch off the amplifier and reverse the connections at ONE END ONLY of ONE speaker cable. Repeat the test. Performance should now be correct. No damage will be done to the speaker or amplifier if one speaker is connected out of phase, but performance will noticeably suffer.

## 2.8 Grilles

A purpose designed lightweight moulded grille is factory fitted to each loudspeaker. However, if you wish you may remove the grille by gently pulling it forward toward you. The grille is held on via 'pegs' that locate into the front baffle grille-peg sockets. If required, the grilles may be removed during use, but KEF recommends replacement following use.

For cleaning purposes, the grilles should be removed from the cabinets and brushed lightly with a soft brush. Alternatively, use a variable suction vacuum cleaner, with soft brush attachment.

## 2.9 Amplifier Requirements and Power Handling

In KEF literature and within the specification table within these instructions are listed a range of amplifier power outputs to match your Reference Series loudspeakers. Conditions of use (room size, type of programme, preferred listening level) and the nature of the loudspeaker/amplifier interface vary so widely that it is not possible to lay down hard and fast rules about amplifiers and the loudspeakers they drive.

KEF loudspeakers are built to rigorous standards of quality and consistency and the upper limits of the amplifier requirements shown are those which the loudspeaker in question should handle without distress or damage when used under normal domestic conditions.

If higher than specified amplifier powers are used, great care should be taken to avoid abnormal conditions such as switch-on surges or gross distortion, either of the amplifier or the speaker, resulting in power peaks greatly in excess of the ratings specified. Care should be taken as the possibility still exists under certain conditions (such as excessive bass or treble boost caused by tone and/or loudness controls, graphic equalisers, etc.) that the speakers can be overloaded and damaged. The lower limits of amplifier power are those necessary to give a reasonable sound pressure level under domestic conditions.

Remember it is 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.

Should you decide to buy a new amplifier, or upgrade your existing one, always try to audition new equipment through your own type of loudspeakers, ideally in your home, prior to purchase.

### **3.0 WARRANTY**

Your KEF Reference Series loudspeakers are guaranteed against manufacturing defects in both materials and workmanship. For further details of how this guarantee affects you, please read the enclosed Warranty leaflet. It should be noted, however, that failure of the loudspeaker due to abuse, improper or inappropriate use and/or operation or damage caused by other faults in your system are NOT covered within the terms of the guarantee.

### **3.1 Service Information**

Loudspeakers are inherently reliable and rarely give trouble. It is important to remember that faults arising in any part of the reproducing system will be heard via the loudspeakers and therefore when faults occur, careful and analytical diagnosis will be required to locate the actual source of trouble.

Loudspeakers cannot generate hiss or hum. Spurious noises of this type generally originate in the electronic sections of the equipment or even in the programme source itself. Faults in a loudspeaker will be audible on all programme sources. A fault which is evident only when playing CD's but not, for example, when using a radio tuner is unlikely to originate with the loudspeakers.

Service problems should be discussed in the first instance with the dealer from whom the speakers were originally purchased. Generally, warranty claims are best handled by your dealer. However, in case of difficulty, please contact:

**Customer Services Department  
KEF Audio (UK) Limited  
Eccleston Road, Tovil  
MAIDSTONE, Kent, ME15 6QP UK**

**Telephone No.: +44 (0)1622 672261**

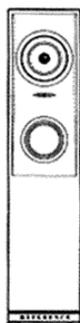
**Fax No.: +44 (0)1622 672939**

**Distributed in the U.S.A. by:  
KEF Electronics of America, Inc.  
89 Doug Brown Way, Holliston, MA 01746 USA**

**Telephone No.: +1 (508) 429 3600**

**Fax No.: +1 (508) 429 3699**

## 4.0 TECHNICAL SPECIFICATIONS



Product:	Model One	Model Two	Model Three	Model Four
<b>Description:</b>	3-way 3-driver	3-way 4-driver	4-way 5-driver	4-way 6-driver
<b>Drive Units:</b>				
<b>HF Unit:</b>	NT25 25 mm (1") soft dome	NT25 25 mm (1") soft dome	NT25 25 mm (1") soft dome	NT25 25 mm (1") soft dome
<b>MF Unit(s):</b>	MB160 160 mm (6 1/2") polypropylene cone	MB160 160 mm (6 1/2") polypropylene cone	MB160 160 mm (6 1/2") polypropylene cone	MB160 160 mm (6 1/2") polypropylene cone
<b>Lower MF Unit(s):</b>			B160 160 mm (6 1/2") polypropylene cone	2 x B160 160 mm (6 1/2") polypropylene cone
<b>LF Unit(s):</b>	B160 160 mm (6 1/2") pulp-cone	2 x B160 160 mm (6 1/2") pulp-cone	2 x B200 200 mm (8") pulp-cone	2 x B250 250 mm (10") pulp cone
<b>Crossover Frequencies:</b>	2.8 kHz, 140 Hz	3 kHz, 150 Hz	3 kHz, 400 Hz, 140 Hz	2.8 kHz, 500 Hz, 160 Hz
<b>Frequency Range <sup>1</sup> +/- 3 dB:</b>	55 Hz - 20 kHz	45 Hz - 20 kHz	40 Hz - 20 kHz	35 Hz - 20 kHz
<b>-6 dB:</b>	50 Hz	39 Hz	36 Hz	32 Hz
<b>Maximum Output <sup>2</sup>:</b>	110 dB	113 dB	115 dB	118 dB
<b>Characteristic Sensitivity Level <sup>3</sup>:</b>	89 dB	90 dB	91 dB	92 dB
<b>Amplifier Requirements <sup>4</sup>:</b>	50 - 150 W	50 - 200 W	50 - 300 W	50 - 400 W
<b>Nominal Impedance:</b>	4 ohms	4 ohms	4 ohms	4 ohms
<b>Enclosure Type:</b>	Single Interport Single Coupled Cavity	Twin Interport Twin Coupled Cavity	Twin Interport Twin Coupled Cavity	Twin Interport Twin Coupled Cavity
<b>Internal Volume:</b>	MF: 2.5 litres LF: 32 litres	MF: 2.5 litres LF: 40 litres	UMF: 2.5 litres LMF: 2.5 litres LF: 68 litres	UMF: 2.5 litres LMF: 5 litres LF: 95 litres
<b>Net Weight:</b>	25.9 kg (57 lb)	29.6 kg (65 lb)	35 kg (77 lb)	49 kg (108 lb)
<b>Dimensions (h x w x d)</b>				
mm	864 x 230 x 300	1012 x 230 x 300	1137 x 275 x 340	1266 x 300 x 390
ins	34 x 9 x 11.8	39.8 x 9 x 11.8	44.8 x 10.8 x 13.4	47.8 x 11.8 x 15.3

Features and specifications subject to change without notice.

Uni-Q<sup>®</sup> is a trade mark of KEF and is protected under UK Patent No. 2 236929. World-wide patents pending.

### Notes:

1. Measured at 2m on reference axis.
2. Maximum spl on programme peaks under typical listening conditions.
3. Measured at 1m on reference axis for pink noise input of 2.83V (anechoic conditions).
4. 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. It is easier to damage the loudspeaker by using a small amplifier driven into distortion by too much volume with bass and treble boost, than by using a larger amplifier which has power in reserve. If in doubt, ask your dealer.