

KEF REFERENCE SERIES

MODEL 102.

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INSTALLATION MANUAL/MANUEL D'INSTALLATION



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1.0 INTRODUCTION

The KEF Reference Series Model 102 is an ultra compact speaker system that is efficient, easy to drive, and has bass extension to 40 Hz (-6dB, Q = 0.5) with a maximum spl of 107dB.

It is the ideal model for locations where space is at a premium. Physically very compact it may be, but KEF's advanced 'hybrid' dividing network technique creates the character of a full size design, with little compromise in power handling, sensitivity, or loudness capability. Model 102 is the smallest of the Reference Series loudspeakers.

Model 102 is supplied complete with its own dedicated version of the KEF KUBE low-level equalisation system. This provides unusually extended low-frequency reproduction without the usual reduction in sensitivity normally associated with passive systems of this size. KUBE offers the user an additional, important benefit. It gives him the freedom to site the loudspeaker wherever it is most convenient, using KUBE's Contour control to achieve a natural balance, compensating for room boundary reinforcement effects by adjusting the level of bass output relative to midrange and high-frequency.

Model 102 uses a newly developed 6" (160mm) bass/midrange driver with a polypropylene cone. Even when operated with KUBE in 'bass extend' mode, this unit has more than enough power handling capability allied to the traditional KEF virtue of low colouration, to give life-like reproduction on all types of programme.

High frequencies are handled by the refined, ferrofluid cooled T33 high-frequency unit, also high in sensitivity and power handling, which features in most of the Reference Series models, including the new top-of-the-line Model 107.

As in all KEF's hybrid crossover designs, KUBE provides active system response shaping, thereby maximising the system's sensitivity and dynamic range. The passive network, within the loudspeaker enclosure, divides the incoming signal between the two drive units; 'conjugate' load matching ensures that the impedance seen by the amplifier is entirely resistive and easy to drive at all frequencies above 200Hz, so extending the usable power output of even the most modestly specified amplifier. All components used in the dividing network have very high power handling capability, ensuring linearity even at high levels, with low distortion throughout.

The Reference Series Model 102 has unusually wide bandwidth for its size allied to good sensitivity. Cabinet veneers are in real wood, drive units, components and finished networks are all carefully matched in pairs prior to assembly.

Every Model 102 is specified to tight tolerances against an absolute reference standard, with even closer matching between the two systems which make a stereo pair. Technical data relating to each and every system is held on computer at the factory. This database enables service replacements which precisely match the original performance to be selected if required.

1.1 GENERAL NOTES

Your new KEF Model 102 loudspeakers contain a number of significant innovations, chief among which is the ability they give you, with KUBE, to tailor the sound balance to your room, and to select both bass extension and characteristic to suit the programme material you choose and your listening preference.

Set-up is simple, but somewhat more critical than with most conventional loudspeakers.

Please take the time to read this manual carefully and follow the procedures for setting up and connecting your Model 102.

Care taken over set-up will ensure their optimum performance and your listening pleasure.

One pair of KEF Model 102 loudspeakers is contained in two cartons:
1 carton containing 2 loudspeaker systems, and
1 carton containing KUBE and Installation instructions.

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IMPORTANT

In addition to adjustable low-frequency response, KUBE also contains important equalisation elements. Model 102 will only operate correctly therefore with KUBE in circuit. No damage will be done should KUBE inadvertently be left 'off', the system simply will not sound right.

1.2 INSTALLATION PROCEDURE

Installation should be carried out in the following sequence. Full details of each step will be found in Sections 2.0 and 3.0 below.

1. Position speakers and connect to amplifier
2. Connect KUBE to amplifier
3. Connect KUBE to power supply
4. Set KUBE controls to reference setting
5. Switch on system
6. Carry out listening tests and make any necessary adjustments

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2.0 MODEL 102: THE LOUDSPEAKERS

2.1 UNPACKING, ASSEMBLY AND AFTERCARE

Unpack the speakers and the bag of accessories. Retain the packaging in case you need to transport the speakers at a later date.

Unpack KUBE and identify the connection markings on the rear panel. Do not connect the KUBE to your amplifier at this time.

We suggest you place the KUBE packing in one of the empty loudspeaker cartons for possible future use.

Aftercare

Your Model 102 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 ROOM POSITION AND LISTENING WINDOW

Model 102 is designed to be used either on a shelf or on a stand, and is ideally suited to use in a position against, or close to, a wall. The bass reinforcement which normally occurs when conventional speakers are placed in such a position may be corrected by means of the Contour control on KUBE (see Section 3.3).

The height of the shelf or stand should be chosen so as to position the top of the loudspeaker 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.

The tonal quality and clarity of the reproduction, and above all, the sharpness of the stereo image, are determined by the sound that reaches the listener directly, without reflection from walls, floor or ceiling.

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Reflections from nearby walls, mirrors, even the television set can spoil stereo definition by confusing the primary image. Large items of soft furniture can cause absorption of midrange and high frequencies.

Model 102 is capable of giving a stable stereo image over a wide listening area with an unusually vivid sense of depth perspective. Since this is achieved in part by the proportioning of the enclosures to permit sound to diffract smoothly, these benefits may be impaired by reflections from nearby walls.

If Model 102 is used on bookshelves, the front of the speaker should be level with, or project slightly (1", 25mm) forward from the front edge of the shelf. Avoid having nearby books or other items projecting further forward than the loudspeaker.

Model 102 should not be placed on its side. The speaker will not be damaged, but its directional and stereo imaging properties will be severely impaired.

If the speakers are to be used on stands they should ideally be stationed at least 1m from side walls and a minimum of 50cm from any back wall.

The spacing between the two speakers, and the listening distance from them is important.

If the speakers are placed too close together, the stereo image will not be fully developed. For normal listening, placement will usually be between 2m and 4m apart depending upon the listening distance and the room size. The listeners' distance from the speakers should be equal to, or greater than, the distance between the loudspeakers. Tests should be made with both music and speech before deciding upon the final location.

2.3 SPEAKER CONNECTIONS

The terminals fitted to the Model 102 will accept either bare wire, 4mm 'banana' plugs, or 6mm spade connectors. If you use bare wire you will need to strip 12.5mm (1/2") of insulation - twist the wire strands tightly together with clean fingers, and having previously unscrewed the terminal, push the wire through the hole in the terminal and screw it up TIGHT. Make sure there are no stray strands of wire which can cause a short circuit between the two terminals. If 4mm 'banana' plugs are used, choose a good quality sprung or expanding type, making sure the cable is properly connected and that the plugs fit tightly into the sockets. Normal polarity of connections (amp positive/red to speaker positive/red and amp black to speaker black) should be observed.

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

Correct polarity is vital to the proper operation of the system. Once the system is fully installed, with KUBE lead connected, you can check the polarity in the following manner.

Place the two loudspeakers close 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, operating both speakers simultaneously with the amplifier switched to 'mono'. Repeat the test after changing over the connections on one loudspeaker. Correct polarity is indicated by firm, full bass. When polarity is incorrect, the bass will be noticeably weaker.

Keep the speakers facing each other and, after establishing correct polarity as above, again reverse the connections on one loudspeaker. Using the same piece of music, and keeping the signal in mono, rotate the balance control on your amplifier on either side of 'centre'. You will hear a point at which the signal almost disappears. At this point the output from both loudspeakers is the same. In an ideal symmetrical listening set-up this should be the setting adopted (do not forget to correct the polarity change you have just made). You may need to use the balance control to compensate for an "off centre" listening position, or asymmetrical speaker positions within the room. Model 102's imaging capabilities are outstanding and it is worthwhile spending some time in achieving the correct balance between the two speakers from your normal listening position.

Always try to keep the cable run from amplifier to speakers as short as possible to minimise power and high frequency losses.

The choice of cable to use with Model 102 is less critical than with most other loudspeakers owing

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should not exceed 0.2 ohms.

The table (A) shows the maximum length that can be used in various gauges without audible effect on speaker performance. As a general guide good audiophile speaker cable has a cross section of approximately 4 square mm. Colour coded cable is recommended to assist checking polarity.

Always use cables of equal length to both speakers even if the actual length of the cable run in the room is different. If one run is shorter than the other the excess cable should be folded neatly, concertina fashion, and secured with a cable tie or elastic band.

The importance of good, clean, tight connections to your loudspeakers cannot be over emphasised.

It is good practice occasionally to remake all connections. In the case of wrapped connections, cut off the old wire and strip the insulation back to expose fresh.

CAUTION: Certain exotic types of cable have high capacitance which can cause instability with some amplifiers. If in doubt, select a cable from the table, or consult your dealer.

2.4 AMPLIFIER REQUIREMENTS AND POWER HANDLING

Despite its small size, Model 102 has unusually high sensitivity. If used with your existing amplifier, you will almost certainly find that you need a lower volume setting than you have been used to, to achieve your normal, preferred listening level.

Model 102 will produce realistic listening levels when used with amplifiers having a power output, into 4 ohms, of between 50 and a maximum of 200 watts. The final choice of amplifier will depend upon the size of your listening room and your choice of programme and listening level.

Model 102 will prove accurate and reliable, providing life-like reproduction on a wide variety of programme, subject to the above comments on amplifiers and power handling, under normal conditions of use.

Since Model 102 will out-perform virtually any other loudspeaker of its size, a cautionary word about the temptation to use it under abnormal conditions is in order. Abnormal conditions includes the playing, at higher than normal volume levels, of predistorted programme i.e. material containing significant amounts of artificially boosted low-frequencies, favourite 'demonstration' tracks, or items containing heavy low-frequency transients.

Under such circumstances it is possible for the system to be overloaded, particularly when reproducing heavy bass.

When the system is overdriven in this way it will emit a sharp 'cracking' sound. This is due to the bass unit reaching its designed excursion limit. If this occurs, simply reduce the volume level until the overload disappears. No harm should come to the loudspeakers due to the occasional accidental overload, but where this has occurred you may wish to make a note of the maximum volume setting for future use (see also KUBE section 'Extension' p.11).

2.5 RECORD SUGGESTIONS

The importance of listening tests in setting up your hi fi system has been emphasised in these instructions. Use records having good tonal balance with good imaging qualities, covering as wide a range of music and voice as possible. To assist your setting-up, and add to your musical enjoyment, KEF recommend the following records (table B) in either analogue or CD (where available) format.

A general check on system performance can also be carried out using one of the many test discs available. One such, which is particularly simple to use is 'The Enjoyment of Stereo' by John Borwick, EMI SEOM26.

Wire Type	Resistance per metre	Length for 0.2 ohms
area mm ²	milliohms	m
0.75	46.0	4.3
1.0	34.5	5.8
1.25	27.6	7.2
1.5	23.0	8.7
2.5	13.8	14.5
4.0	8.6	23.3
6.0	5.7	35.1
10.0	3.4	58.8

USA

AWG	Resistance per metre	Length for 0.2 ohms
18	42.2	4.7
16	26.4	7.6
14	16.5	12.1
12	10.4	19.2
10	6.5	30.8
8	4.1	48.8

TABLE A

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Rachmaninov/ Saint Saens	Rhapsody Piano Concerto No.2	Philips 410 052
Brahms	Piano Concerto No.2	Decca 410 199
Debussy	Preludes	Denon 38C37
de Falla	Three Cornered Hat	Decca 410 008
Rachmaninov	Symphonic Dances	Decca 410 124
Canteloube	Auvergne Songs	Decca 410 004
Laurie Anderson	Mister Heartbreak	Warner 925 077
Peter Gabriel	Four	Charisma 800 091
Elton John	Superior sound of	DJM 810 062
Rickie Lee Jones	Rickie Lee Jones	Warner 256 628
Joe Jackson	Body and Soul	CBS 6500
Thomas Dolby	The Flat Earth	EMI 85930

TABLE B

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3.0 MODEL 102: KUBE

3.1 DESCRIPTION OF KUBE AND ITS CONTROLS

KUBE is an active low-level equaliser which, when connected between the pre- and power amplifier or in the tape or processor loop of your pre-amplifier, provides two types of equalisation, one fixed, the other variable.

The fixed equalisation provides response shaping for the Model 102 system. This equalisation forms part of the speaker's crossover network and is an essential part of the design.

The variable equalisation consists of two controls allowing you to optimise low-frequency performance to suit both listening environment and programme material.

These two controls are marked **Contour** (controlling LF/MF balance), and **Extension** (setting the speakers' bass cut-off frequency).

NB: Because KUBE contains part of your loudspeakers' crossover network, it should always be in circuit when the loudspeakers are operating. Switching the Tape Monitor loop in and out to try to make A/B comparison of the effects of bass equalisation will not cause any damage, but will result in incorrect system balance.

3.2 INSTALLING KUBE

KUBE may be connected to your system in one of two ways:

1. In the tape or processor loop of your pre-amplifier
2. In line between pre- and power amplifier.

Best signal to noise performance, particularly when listening at low levels, will be obtained by using Method 1. Method 2 should be used if you experience any distortion during loud passages, independent of the volume control setting.

This is only likely to occur with pre-amplifiers where signal levels higher than normal are present at the TAPE OUT/RECORD sockets.

If you are in any doubt about matching KUBE to your equipment consult your dealer.

SIGNAL CONNECTIONS

Method 1: Fig.1

Connect the KUBE 'Signal In' sockets to the amplifier sockets marked TAPE OUT/RECORD

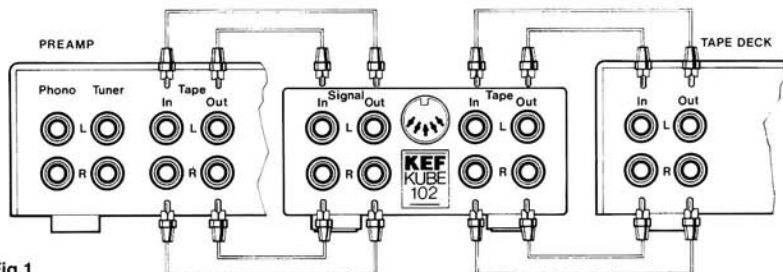


Fig.1

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OUT/LINE OUT, and then connect 'Signal Out' to the amplifier sockets marked TAPE IN/TAPE REPLAY/LINE IN. If you have only one set of tape sockets into which a tape deck is already connected, disconnect the tape deck from your amplifier and re-connect to the tape sockets provided on the rear of KUBE 'TAPE OUT' to TAPE DECK 'RECORD IN', TAPE DECK 'REPLAY' to KUBE 'TAPE IN'.

KUBE's equalisation only affects the replayed signal. The signal recorded onto the tape is unaffected, allowing normal playback on other tape decks, or in the car.

If your amplifier/receiver is equipped with an external processor loop facility, then connect the KUBE 'Signal In' to the processor loop output sockets, and 'Signal Out' to the processor loop input sockets.

Method 2 Fig.2

Connect the KUBE 'Signal In' to the pre-amplifier output sockets, and 'Signal Out' to the power amplifier sockets.

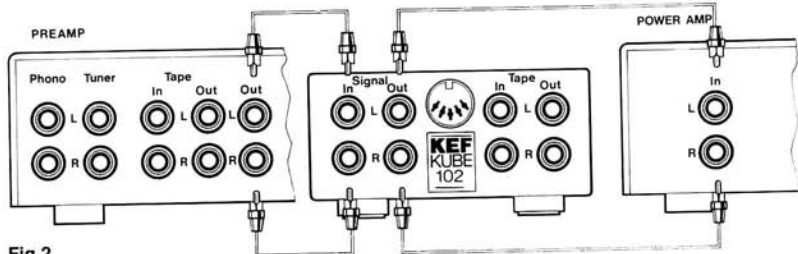


Fig.2

NB: Take care to observe correct left and right channel orientation when making connections. The leads supplied with KUBE are colour coded to help you achieve this. Connect the white plugs always to the LEFT sockets, and red to RIGHT.

POWER SUPPLY CONNECTIONS

KUBE is powered by means of an external AC adaptor fitted with two flying leads. One is the power cord and the other, terminated in a DIN plug, is the low voltage AC supply for KUBE.

The AC adaptor is pre-wired at the factory, and appropriately labelled, for either 110V or 220V nominal working voltage.

CAUTION: Check that the voltage marked on your KUBE AC adaptor corresponds to the AC supply in your home. If correct, plug the DIN plug into the low voltage power input socket on the rear of KUBE. Next, connect the AC adaptor power cord to a suitable AC outlet, either in the wall or if available, on your amplifier, and check that the front panel LED is lit.

KUBE power consumption is negligible and so it is convenient to leave it 'ON' all the time that your system is in regular use. If for any reason your equipment is not going to be used for an extended period e.g. holidays, then it is good safety practise to remove the KUBE power cord from the AC outlet.

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3.3 USING KUBE Fig.3

INSTALLATION CHECK

Before switching on your hi fi system, make a final check on the following points:

Are the speakers connected to the amplifier?

Is KUBE connected correctly, according to the instructions above?

PRELIMINARY SET UP

Check that the LED on the front panel of KUBE is illuminated.

Identify the TAPE push button on KUBE, and make sure this is in the 'SOURCE' position, i.e. Out.

If KUBE is connected in the tape monitor/external processor loop of your amplifier, select TAPE MONITOR/EXTERNAL PROCESSOR on your amplifier controls. If you wish to replay signals from a tape deck, please see below: USING THE CONTROLS: TAPE

Select the desired source (CD, Disc etc.)

Set the controls on the front panel of KUBE so that Contour is at 0 (centre detent) with Extension and Tape buttons 'out'.

For best results adjust the controls in the following order. Do not adjust **Extension** whilst setting **Contour** - you are likely to end up with a confused and incorrect result.

You can check very simply that KUBE is in circuit. Using radio or disc as the source, and with any tape deck connected to the rear panel of KUBE switched off, play some music. Press in the TAPE button on KUBE and the signal should mute. If it does KUBE is correctly installed and operating. If it does not, check the connections described above and, if connected in the tape loop, that TAPE MONITOR has been selected on the pre-amplifier.

USING THE CONTROLS: CONTOUR

All speakers interact both with the room in which they are used, and with their position within that room. It is unlikely that any speaker will sound equally good in all rooms, and certainly not in all positions. KUBE's **Contour** control is designed to allow you to optimise Model 102 for your listening room and preferred sound balance. It does this by raising or lowering the frequencies below about 160Hz by up to 3dB.

Select disc or CD and play a record with well defined extended bass. Listen carefully to the balance between bass and midrange. If you think the bass is too 'full-bodied' or over prominent, turn the **Contour** control anti-clockwise. If the speakers sound 'thin', turn the knob clockwise. Experiment with different records, giving yourself time to get used to the way the **Contour** control operates.

If you have difficulty achieving a suitable balance try experimenting with the speakers' position, remembering that moving them closer to a wall or corner will produce more bass, away from walls will give less.

It may take some time, and a number of records before the right setting is achieved.

Once the correct speaker position and contour setting has been established you should be able to leave the contour setting where it is and ignore it.

USING THE CONTROLS: EXTENSION

The **Extension** control allows the choice of two lower cut-off frequencies. With the button 'out' the speaker's lower cut-off frequency is set to 50Hz. With the button 'in' the cut-off frequency is set to 35Hz (-6dB, Q = 0.5). The cut-off frequency you choose will depend on the type of programme material and conditions of use.

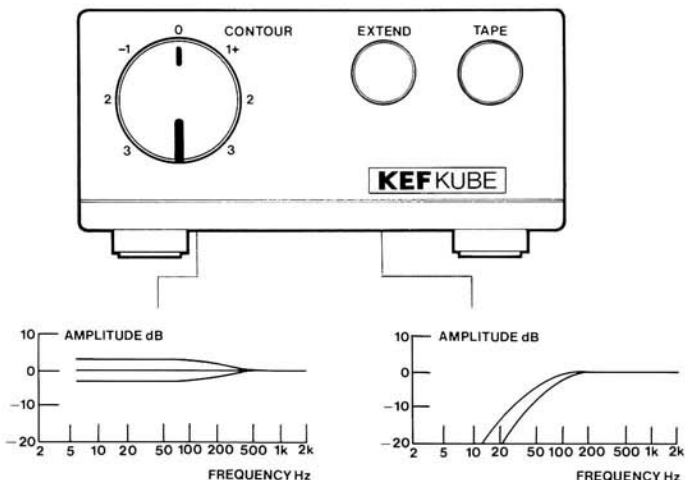


Fig.3

For critical listening to music containing significant low-frequency information (e.g. pipe organ, synthesiser, piano or percussion) then a setting of 35Hz should be chosen. The higher setting of 50Hz should be used for less critical listening, when the source material does not require extension or is of inferior quality. This setting should also be used if Model 102 is to be used to provide continuous high-level music at parties, thus avoiding the possibilities of overload.

CAUTION: KUBE applies PRECISELY the right amounts of equalisation to your system. The use of graphic equalisers, or your amplifier's Bass or Loudness controls is not only unnecessary, but may lead to the possibility of amplifier overload and consequent damage.

USING THE CONTROLS: TAPE

If your tape deck is connected to the rear of KUBE and you wish to play a tape, push in the MONITOR button on KUBE. For listening to signals going onto the tape when recording, the button should be out.

Note that the signal passing through the KUBE to the tape deck is not modified. KUBE is only operative on replay. At all other times, leave the TAPE button out.

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4.0 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 discs but not, for example, when using the radio tuner, is not likely to originate with the loudspeakers.

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

Customer Service Department, KEF Electronics Limited,
Tovil, Maidstone, Kent, ME15 6QP. Telephone (0622) 672261
Telex 96140.
Fax (0622) 50653

This precision engineered KEF product is guaranteed against faulty material and workmanship for a period of five years from the date of original purchase subject to the following restrictions:

1. This warranty is only valid in the country of purchase
2. That the equipment has not been disassembled, modified or tampered with by any person other than an expressly authorised representative of KEF Electronics Limited
3. That the equipment has not been abused or operated in conjunction with unsuitable or faulty apparatus
4. That the equipment has not suffered mechanical damage or derangement in transit

Should service be required, notify the dealer from whom you purchased the equipment and have him arrange onward shipment to KEF ELECTRONICS LIMITED or an authorised agent if he confirms the need for factory attention. Do not despatch goods without prior agreement of KEF or their authorised agents.

If asked to return products for inspection and/or repair, pack carefully, preferably in the original cartons and return prepaid.

Insurance is recommended as goods are returned at owner's risk. KEF or their authorised agents cannot be held liable for loss or damage in transit. Packing and insurance and freight on the return journey will be paid by KEF if warranty work proves to be necessary.

Failure to register in no way limits or invalidates the warranty, but in the event of service being required, delay may result since our Service Department cannot begin warranty work until the original sale has been verified.

FOR THE USA

This KEF loudspeaker is warranted to the original purchaser against original factory defects in material or workmanship for a PERIOD OF FIVE YEARS FROM THE DATE OF ORIGINAL PURCHASE.

What we will do

Should your KEF loudspeaker fail to function properly because of a manufacturing defect, KEF will repair or replace it free of charge. If the product is still defective after a reasonable number of attempts by the warrantor to remedy the defect, you may elect a refund of the purchase price or replacement without charge. Before a refund or replacement can be made, the product must be free of all liens and other encumbrances.

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How to obtain service

Should service be required, contact the dealer from whom you purchased the equipment and have him arrange onward shipment to KEF Electronics Limited or an authorised agent. Ship the product prepaid, only after receiving written authorisation and instructions from the dealer.

Include a written description of the claimed defect, and your original sales slip or other proof of ownership and date of purchase.

We strongly recommend that speakers be packed in their original cartons and packing material and that all shipments be insured (KEF cannot be responsible for loss or damage in shipment). Packing, insurance and return freight will be paid for by KEF if work covered under the warranty is necessary.

What is not covered

This warranty does not cover a loudspeaker system which has been:

1. damaged while in your possession
2. overloaded, abused, misused or operated with faulty or unsuitable equipment

IN NO EVENT SHALL THE WARRANTOR BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, whether damages result from breach of express or implied warranties, tort, negligence or otherwise.

Some states do not allow exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

If you have any questions about this warranty and your dealer has not been able to assist you, please contact:

KEF Electronics of America Inc., 14120-K Sullyfield Circle, Chantilly, VA22021.
Telephone (703) 631 8810 Telex 510 100 2304. Fax: (703) 830 7625.

OWNER REGISTRATION INFORMATION

Please complete and return the product safety registration card within 14 days of purchase. Failure to register does not invalidate your warranty, but in the remote event any safety hazard develops with this product, your registration card will facilitate our notifying you promptly.

KEF reserves the right to incorporate developments and amend the specifications without prior notice in line with continuous research and product improvement.

KEF Electronics Limited, Tovil, Maidstone, ME15 6QP
England Tel: (0622) 672261

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Distributed in the U.S.A. by:

KEF Electronics of America Inc.
14120-K Sullyfield Circle, Chantilly, VA22021
Telephone: (703) 6318810. Telex: 510 100 2304
Fax: (703) 830 7625

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SPECIFICATION MODEL 102 TYPE: SP3079

Frequency Response	65Hz-20kHz +/- 2dB at 2m ref axis (-6dB at 40Hz, Q=0.5)
Directional Characteristics	Within 2dB of response on axis up to 15kHz for +/- 10° vertically, up to 10kHz for +/- 30° horizontally
Maximum Output	107dB spl on programme peaks under typical listening conditions
Enclosure Volume	10.5 litres
Amplifier Requirements	Suitable for use with amplifiers capable of providing between 50 and 200W into 4 ohms resistive load
Nominal Impedance	4 ohms, resistive 200Hz-20kHz
Characteristic Sensitivity Level	92dB spl at 1m on reference axis for pink noise input of 2.83V rms, band limited 50Hz-20kHz (anechoic conditions)
Weight	6.8kg (15 lb)
Dimensions	330(h) x 208(w) x 263(d) mm 13" x 8.2" x 10.3"
Height of Origin of Reference Axis	200mm (7.9") above base of cabinet
Angle of Reference Axis	Horizontal

KUBE TYPE: SP2113

Description	Active equaliser
Controls	Contour: Continuously variable shelf control allows boost or attenuation below c.200Hz. Extension: Push button control allows -6dB point to be set to 40Hz or 60Hz. Q factor = 0.5. Tape Monitor: Push button controls tape input/output via rear sockets.
Rear Panel Connections	Signal Input/Output and Tape Input/Output via gold plated phono (RCA) sockets
Input Impedance	51 Kohms
Source Impedance	100 ohms
Signal to Noise Ratio	95 dBA ref 1V rms
Power Supply	Factory set for nominal 110 or 220V 50-60Hz
Weight	0.5kg (1.1 lb)
Dimensions	52(h) x 100(w) x 140(d) mm 2.0" x 3.9" x 5.5"

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