

Evolution²

USER MANUAL

Evo²-8
Evo²-10
Evo²-20
Evo²-30
Evo²-40
Evo²-50
Evo²-Centre
Evo²-DFS

Wharfedale

Evolution²

CONTENTS

.....

- User Warnings
- Quick Start Guide
- About Your Loudspeaker
- Specifications
- Quality Assurance

WITHIN THIS PACK

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- Accessories

Wharfedale

Evolution²

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Wharfedale

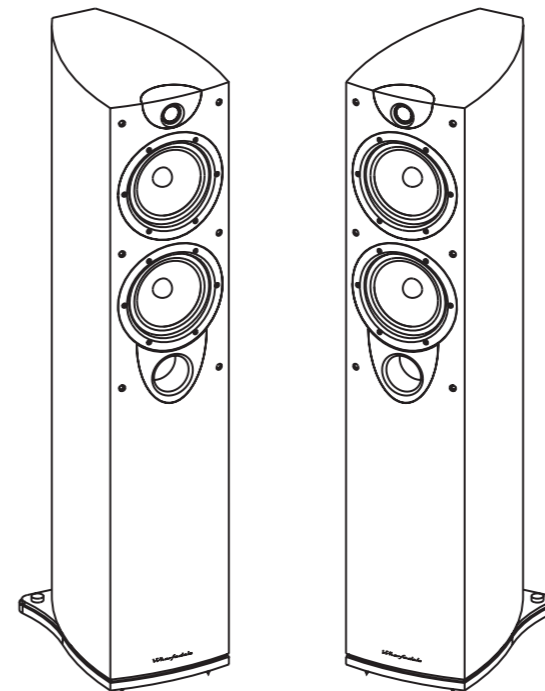
Wharfedale

USER WARNINGS

Please read the following notes carefully. They will help you to install your loudspeakers correctly and safely.

- Switch off the amplifier and all sources before making connections to your sound system. When you switch on the system or change sources, set the volume control to minimum and turn up the level gradually.
- The position of your Volume Control is NOT a reliable guide as to the maximum capabilities of your system.
- Playing the system with extreme settings of volume and tone controls may damage the amplifier and loudspeakers.
- Do not connect loudspeaker terminals to the mains supply.
- Ensure that your loudspeakers are correctly wired and are in phase.
- Do not subject your loudspeakers to excessive cold, heat or sunlight.
- WARNING: To reduce the risk of fire or electrical shock do not expose this product to rain or moisture.
- The product must not be exposed to dripping and splashing and no object filled with liquids – such as a vase of flowers – should be placed on the product.
- No naked flame sources – such as candles – must be placed on the product.
- Do not place heavy objects on top of loudspeaker cabinets. If you play them with the grilles removed be careful to protect the drive units from children and pets.
- Do not use makeshift stands. Always fit a manufacturer' approved stand using the instructions and the fixings provided. Your dealer will advise you.
- Do not attempt to dismantle the loudspeaker. There are no user serviceable parts inside and you will invalidate the warranty.

QUICK SETUP GUIDE (Evolution² Series)



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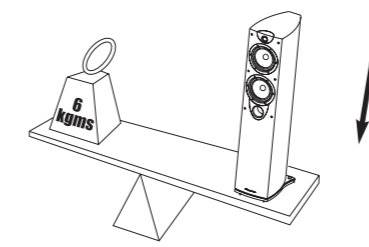
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Wharfedale

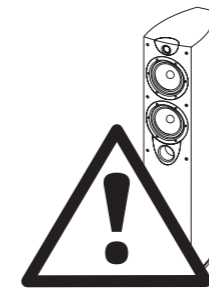
SAFELY UNPACKING

Setting Up the Evo² Series

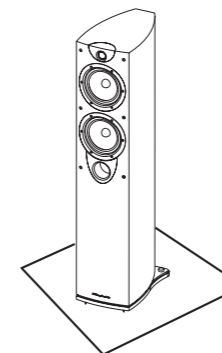
- Safely unpacking
- Check you have
- Loudspeaker preparation
- Positioning stereo Hi-fi speakers
- Connecting stereo Hi-fi speakers
- Positioning AV speakers
- Connecting AV speakers
- Setting up AV systems
- Looking after your loudspeakers



Your speakers are heavy. Take care when removing them from their packaging.

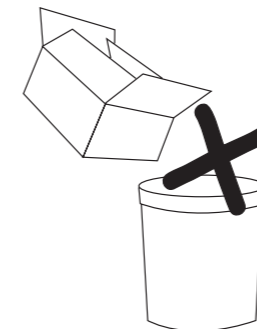


Always take care when lifting heavy objects. Lift the speakers out by their sides.



Carefully remove each loudspeaker from its packing carton. Do NOT lift speakers via the polythene bag. Be especially careful when removing large floor-standing speakers. The carton top says, "Open other end". So you,

- Open the bottom
- Remove polystyrene
- Open bag containing speaker
- Tape the carton flaps back
- Turn over carton with loudspeaker still inside
- Lift carton off, leaving loudspeaker standing on the floor. You may now remove the polythene bag.



If possible, keep the packaging in case you need to move or return your speakers.

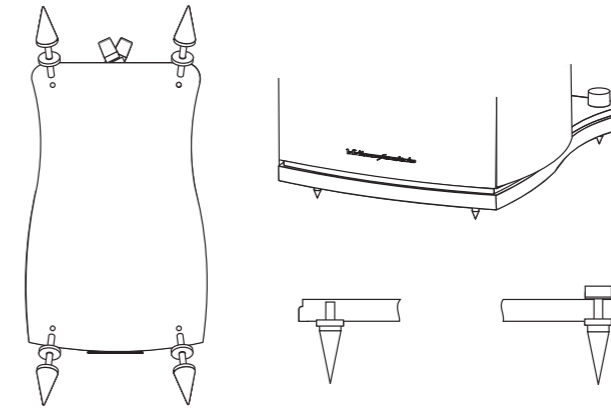
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FITTING SPIKES (EVO²-20,30,40)

Floor standing Evolution² speakers are supplied with a set of floor spikes. Invert the loudspeaker and place the top on a soft surface. Screw the spikes into the bushes fitted in the base of the cabinet. Carefully return the loudspeaker to its normal position. Adjust the height by screwing in or out one or more of the spikes until the loudspeaker is stable. For wood or soft floors spike seats and self-adhesive pads are provided.

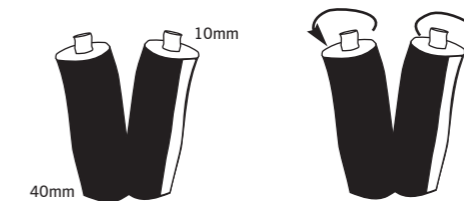
WARNING: Floor standing speakers are heavy - the spikes can penetrate softer floors materials and damage wood and stone floors over extended periods.



CONNECTIONS AND TERMINALS

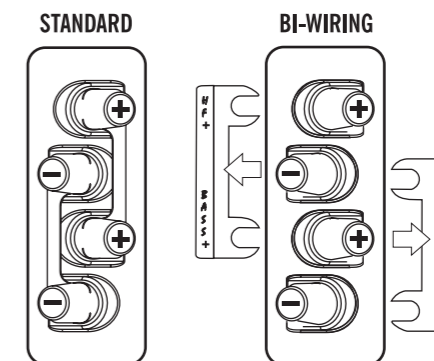
Choosing and Preparing Cables

Specialist audio cable usually offers better performance than general purpose 'bell' or 'zip' wire. Choose a cable of suitable diameter – cable that is too thin will limit the dynamics of the sound and may impair the bass response. Audio cable is polarised, with two cores of different colours, or often a raised rib of coloured tracer in the case of twin cable. Split the twin cores to a depth of about 40mm. Carefully strip the insulation from each end, leaving about 10mm of bare wire. If the cable is stranded, lightly twist to gather any loose strands.



Crossover Networks

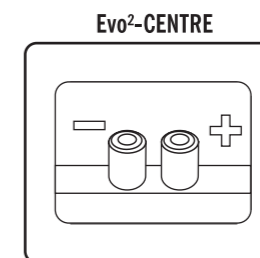
Evo² front and centre loudspeakers use a specially designed bi-wireable crossover panel with four terminal binding posts. Please follow the drawing carefully to see the correct orientation of the loudspeaker terminals. The upper terminals connect to the treble unit and the lower pair to the bass units. As supplied, the treble terminal pair is connected to the bass terminal pair via removable metal straps. These should be left in place for standard single cable installations. The Evo²-DFS speaker uses a twin terminal panel.



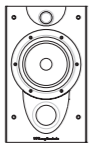
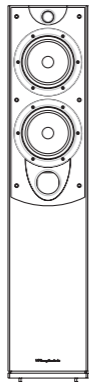
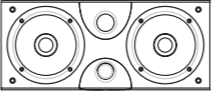
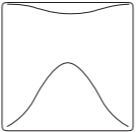
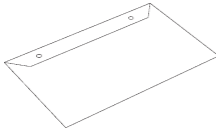
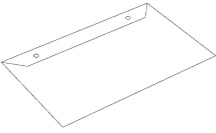
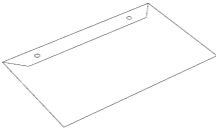
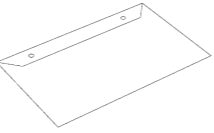
Connecting Loudspeaker Terminals

Unscrew the terminal. Thread the bared end of each cable through the hole in the bottom of the terminal post. Ensure that there are no loose strands which may touch adjacent terminals. Retighten the terminal securely.

NOTE: When connecting loudspeakers, the cables to left and right channels should be of equal length, regardless of the distance of the speakers from the amplifier. In Home Cinema systems, this applies to front and rear channels.



CHECK YOU HAVE

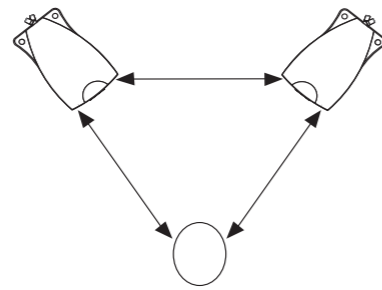
			
Evo ² -8,10	Evo ² -20,30,40,50	Evo ² -Centre	Evo ² -DFS
			
User Pack	User Pack	User Pack	User Pack
	<p>Accessories:</p> <ul style="list-style-type: none"> • Spike set (4) • Soft floor spike seats 	<p>Accessories:</p> <ul style="list-style-type: none"> • Rubber Feet (4) 	<p>Accessories:</p> <ul style="list-style-type: none"> • Rubber Spacers (4)

LOUDSPEAKER PREPARATION

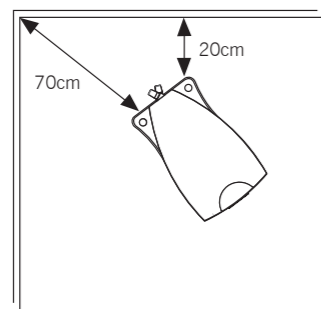
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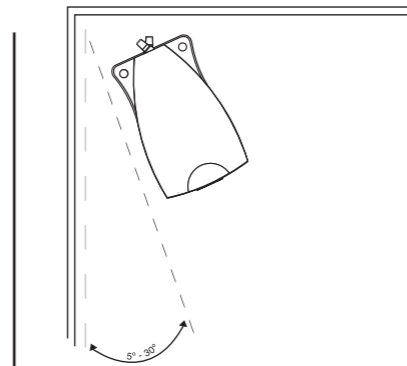
POSITIONING FRONT SPEAKERS



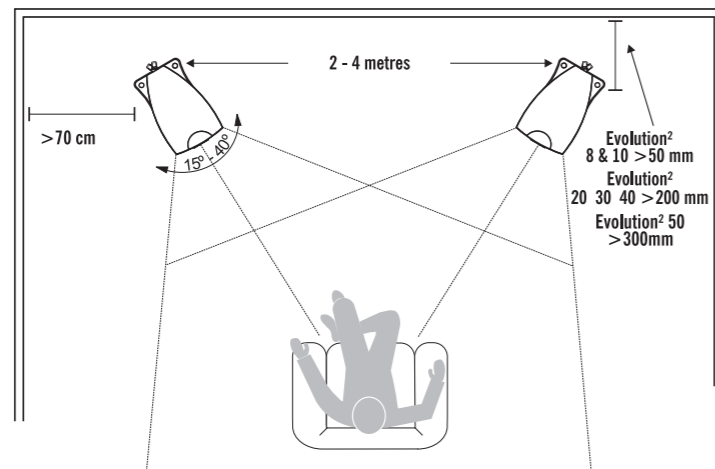
Positioning the speakers. Place the speakers so that you are the same distance from each. The distance between the speakers should be the same as between you and the speakers.



For best results the speakers should be at least 10 inches (20cm) in front of a wall and at least 30 inches (70cm) from any corner.

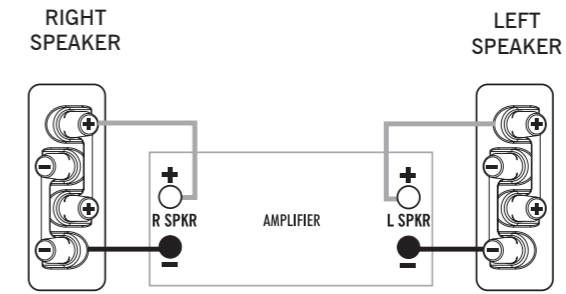


Angle speakers inward by 5° to 30° for a clearer, more tuneful mid range.

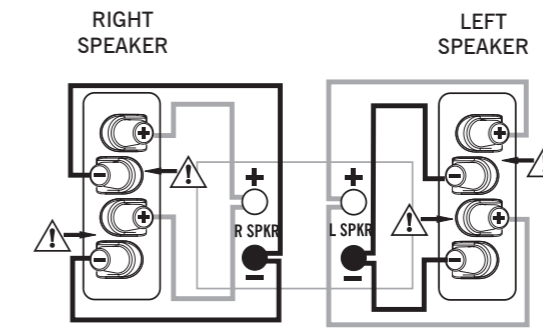


If the loudspeakers are placed too close to the walls the bass will increase but may be boomy and indistinct. If the loudspeakers are placed further away from the walls, the inward angle may be increased by upto 40%, although this may restrict the width of the optimum listening position. As personal taste plays a large role, experiment with different configurations and play a wide range of programme before finalising the position of your speakers.

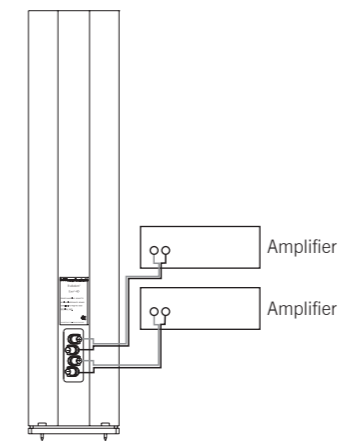
CONNECTING HI-FI SPEAKERS



Single wired a single amplifier, link bars are fitted



Bi-wired – a single amplifier, with separate wires to drive the bass/mid unit and the treble unit. Note that the wiring link bars are removed.



Bi-amplified – two amplifiers. One drives each section. Note that the wiring link bars are removed.

Using separate cables for treble and bass units in a Bi-wiring configuration reduces intermodulation effects and improves headroom and clarity. To Bi-wire, you will need to install two lengths of twin core cable between the amplifier and each loud-speaker. Unscrew each terminal a few turns and remove the metal straps. Connect the cables between the amplifier and the loud-speakers as indicated and re-tighten all the terminals securely. Note: Some amplifiers have two pairs of output terminals to facilitate bi-wiring but this is not essential. The advantages of bi-wiring are fully retained if your amplifier has only one pair of output terminals per channel (as in the illustration).

Important Note, please make sure that heavy multi-standard cables are well connected and clamped. Single loose strands arcing can cause a noise in the woofers like a faulty speaker.

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THE HOME THEATRE ENVIRONMENT

Front and Effects Channels

The front loudspeakers are placed on either side of the television screen, 2 to 3 metres apart. The speakers should be angled slightly so they are aimed towards the listeners. As the rear surround channels are the 'effects' channels the reproduced sound should be as room filling as possible. We recommend placing the speakers in a high position, behind the listeners head. If the rear wall is more than 1 metre behind the listening seat, position the units on the side walls. If the walls are a long way from the listening seat, consider stand mounting the loudspeakers.

Most of the dialogue comes from the centre loudspeaker. Speech should appear to originate from the actors mouths. Operating height is important. Ideally the front and centre channel speakers should be at the same height. For this reason the centre channel speaker is best operated above the television monitor.

The Evo²-Centre Loudspeaker

The loudspeaker should be positioned centrally between the loudspeakers close to the television and mounted either above or below the screen.

The loudspeaker should be located on a stable flat surface to avoid any danger of the cabinet moving when it is vibrated by high sound levels. If you mount the unit on top of the television, move it forward so that the front grilles are level with or slightly in front of the screen. This will reduce reflections from the screen and the top of the cabinet.

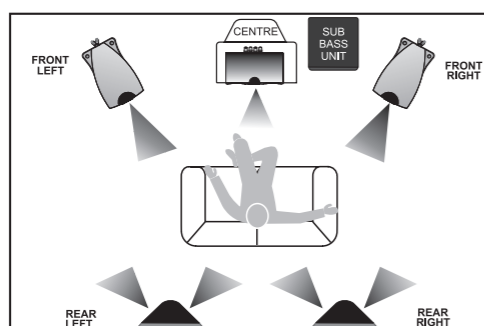
Although you can place the centre channel loudspeaker under the TV monitor, this should be regarded as a second best. The preferred position is always above the monitor.

The Evo²-DFS Loudspeaker

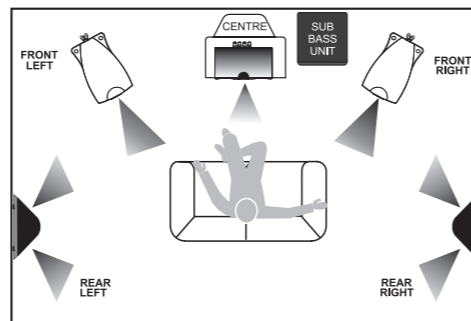
Connect the cable to the speaker. The speaker should ideally be sited 600mm – 1.5 metres above the listening position and 2.5 - 3.5 metres apart, central to the listener and behind the listening position, preferably on a rear wall. If the listening position is some distance from a rear wall, the loudspeakers may be mounted on opposite side walls but always behind the listening position.

Ensure that the wall is strong and can support the product. Drill two 5mm holes in the wall 160mm apart and horizontally aligned. Fix a suitable No 8 round head screw firmly into each hole using appropriate wall plugs. Leave a stub of 5mm protruding from the wall. Align the holes in the mounting brackets over the screw heads and carefully lower the unit onto the screws. The speaker can now be securely attached with the spacers resting against the wall. Now connect the speakers to the amplifier before final mounting of the surrounds.

System with Rear Mounted Evo²-DFS



System with Side Mounted Evo²-DFS

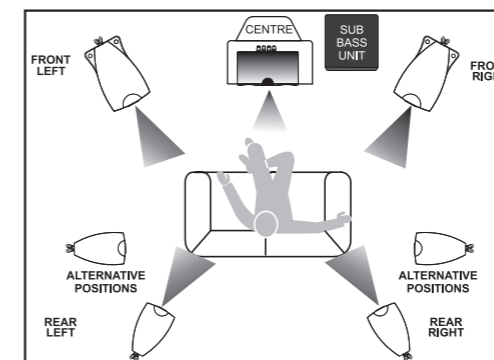


Subwoofer

As the ear is unable to detect the direction from which deep bass originates, this allows you freedom to position a subwoofer according to the level of bass required. Placing the subwoofer near a corner or particularly close to a wall will boost the bass but may impair clarity.

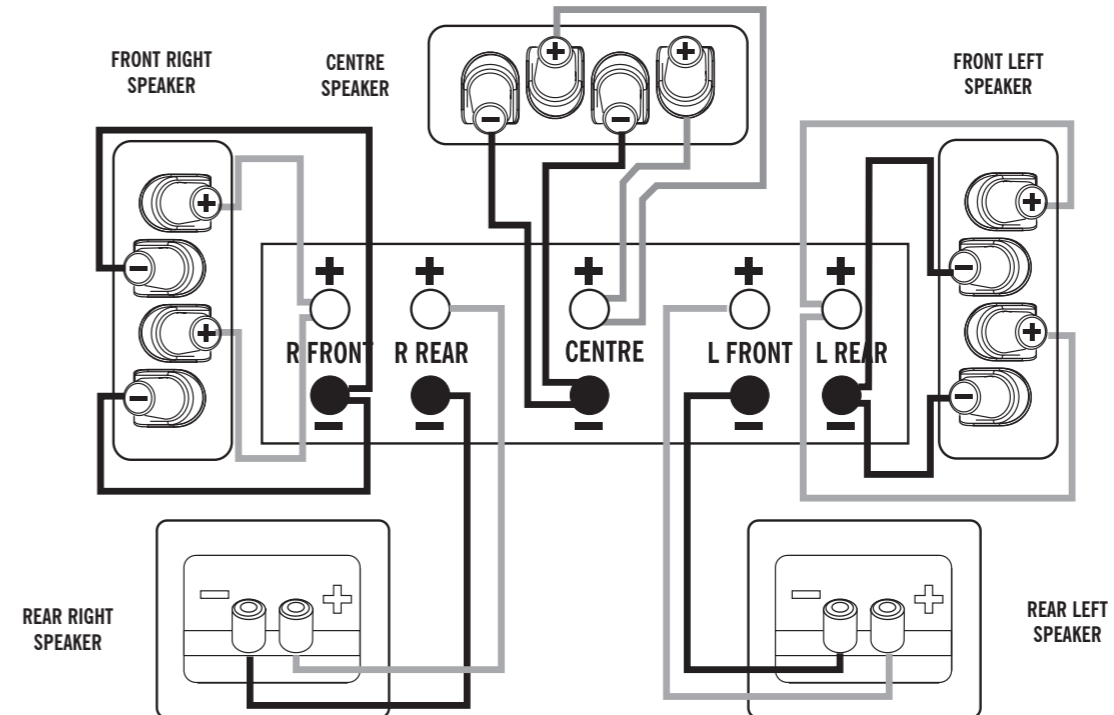
The performance of Home Theatre systems can often be enhanced by using a pair of subwoofers.

System with Subwoofer Speakers



Evo²-Centre Loudspeaker

A set of self adhesive pads is provided. Peel off the backing material and fix a pad close to each corner of the bottom surface of the loudspeaker.



Evo²-DFS Surround Loudspeaker

As the rear effects channels are restricted in both frequency and dynamic range, there is no particular advantage to be gained from bi-wiring. The DFS loudspeaker has a single set of connection terminals as shown in the diagram.

Four self adhesive spacers are provided with each unit. Attach one close to each rear corner of the cabinet. This speaker is designed primarily for wall mounting – please see separate section for this topic.

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Setting Loudspeaker Sizes

Many digital AV Processors require you to specify the size of speakers in all channels. These are usually 'Large or small'. Always set the Evo²-DFS and the Evo²-Centre to 'small'.

IF YOU ARE USING A SUBWOOFER

For the EVO²-8 and 10 when used as Front Speakers: Set these to 'small'. The subwoofer will now receive all the system bass signals.

For the EVO²-30, 40 and 50: Set these to 'large'. The subwoofer then will reproduce only the LFE and bass signals from the effects channels.

The Evo²-20 may be set to either 'large' or small depending on personal preference and the capacity of the subwoofer.

If you are not using a subwoofer: Set the front speakers to 'large'. Set the subwoofer option on the processor to 'Off' or 'No'. The front channels will now receive all the system bass.

Setting Levels

Once the loudspeaker settings have been finalised, put the AV amplifier into its "test" mode (see instructions supplied with your processor). Adjust the level of each channel in turn until all channels are reproduced at equal loudness.

On some programme material the surround channel may seem lower than the front. Do not readjust this level. You may, however, need to adjust the subwoofer output level. Avoid setting too high a level or you will swamp the sound with bass. This can be tiring to listen to, and may limit the subwoofer's ability to respond to large bass transients. You should also set a sensible level going into the subwoofer from the AV processor.

Delay Settings

Many AV processors feature delay settings. The purpose of delay is to enable surround and dialogue information to arrive at the listener's ears at the same time as the front channels, even when the listening seat is in a non-ideal position. On some processors, this can be achieved by setting the distance from the listening position to each speaker in turn, but other systems allow only a time delay setting.

Rear Delay: If the listening position is equidistant from the front and rear speakers, a low delay setting should be set. The closer the listener is to the rear speakers the higher the delay setting used should be.

Centre Delay: If the centre speaker is level with (or slightly behind) the front speakers, set the delay to zero. If the centre speaker is forward of the front speakers, increase the delay.

LFE

In the cinema the low frequency effects channel is an extra bass channel with its own subwoofer and not a regular subwoofer channel. In domestic systems the LFE channel typically feeds into the subwoofer. Where no subwoofer is used, the LFE signal is combined with front channel information and sent to the front speakers. When you set the LFE level at your AV processor, use care as the powerful low frequencies can overload domestic loudspeakers.

If you hear popping or thumping noises coming from the front loudspeakers or subwoofer, immediately turn the AV Processor's volume level down and then lower the LFE level. This should cure the problem. If it does not, lower the volume level at the subwoofer (if you are using one) until the problem disappears.

Please read the relevant sections of your AV amplifier manual and familiarise yourself with the various issues. If you are unsure, consult your dealer for help.

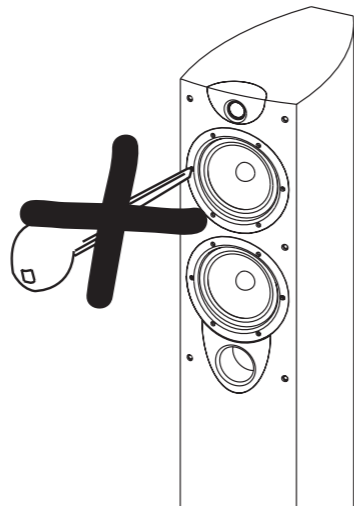
Phase

A home theatre system should have a precise front stage, a diffuse rear stage and good localisation of dialogue. If the colours on the loudspeaker terminals do not correspond with those on the amplifier, the sound will appear poorly focussed or 'Out of phase'. For this reason it is essential that the speakers are connected accordingly to the wiring diagrams in this manual.

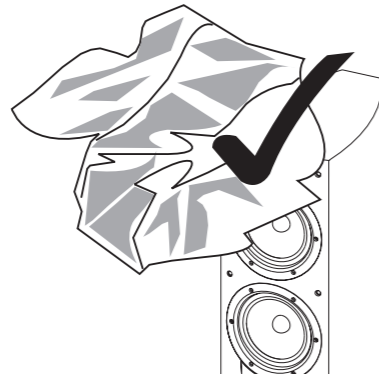
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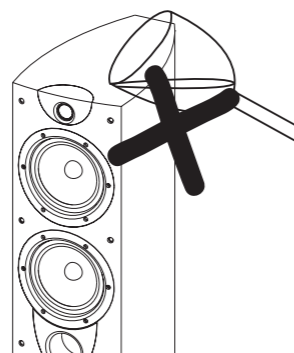
LOOKING AFTER YOUR LOUDSPEAKER



Do not open the speakers; there are no user serviceable parts inside.



Remove marks from the cabinet and polish it with a soft, slightly damp cloth.



Avoid getting any liquid behind the grille.

TECHNICAL SUPPORT AND INFORMATION

For technical support, servicing or product queries and information please contact either your local retailer or the offices below.

UK

IAG Service Centre
Unit 4, St Margaret's Way
Stukeley Meadows Industrial
Estate
Huntingdon, Cambs,
PE29 6EB
England
Tel: +44 (0)1480 452561
Fax: +44 (0)1480 13403
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ABOUT YOUR LOUDSPEAKER

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'THE EVOLUTION² SERIES

The Evolution² series is a range of versatile loudspeakers equally outstanding in both Audio-Visual and 2-Channel applications. When used in Home Cinema systems with the designed DFS surround loudspeaker and the SW range of sub-woofers, they offer a performance unsurpassed in their class. These loudspeakers exhibit exceptional performance characteristics based upon the following concepts.

- Very low distortion across the entire audio band.
- Low excursion requirement of the cone drivers.
- High flux magnet systems enabling good dynamic response and impulse control.
- Broadband dispersion for excellent stereo image and staging.
- Careful attention to component design, operation, integration and acoustics.

THE CABINET

The enclosure of your speaker is finished to a high-quality furniture standard. Real wood veneers are selected and carefully pattern matched by hand. Over a period of several days a high quality hard lacquer finish is achieved. This involves the application of several coatings of lacquers, each being cut and polished before the next coat is applied. Only through this time-consuming and skilled technique, can we achieve the deep and lustrous finish that is the characteristic hallmark of Wharfedale premium loudspeakers.

Instead of the usual cuboid shape, Evo² loudspeaker cabinets feature a beautiful curvaceous design, with a special purpose; - to reduce to negligible levels internal cabinet standing waves and reflections. Skilful engineering in 'MDF' (Medium Density Fibre Board), universally known to be one of the best enclosure materials, has resulted in an ideally shaped, very strong, internally multiple braced, low resonance structure. Parallel-sided tall boxes promote the creation of unwanted acoustic waveforms within the box by reflection up and down its length; these both add and subtract at different frequencies, creating anomalies in the forward response. The multiple curved and braced interior of the Evo² cabinet prevents this - the result is a soundstage of unexampled clarity and precision with pinpoint imaging, even frequency distribution and inherently low coloration.

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THE DRIVE UNITS

THE BASS DRIVERS

The bass driver(s) incorporates a new design of cone utilising our own Kevlar bi-weave process. Kevlar has immense longitudinal strength and is used in many structures where high strength and light weight are key attributes. Kevlar can be found liberally used in Formula 1 racing cars, aeroplanes, boats, spacecraft, skis and even golf clubs.

These fibre bundles are woven and impregnated with special bonding resins that are subsequently pressure formed and heat cured. The resulting material is stiff, rigid and exhibits very low levels of internal resonance. Consequently, energy losses in the cone transfer mechanism are very low.

Similarly, lateral voice coil strength is very high. We use a combination of half hard aluminium and resin bonded glass fibre. This, in turn, contributes towards some of the lowest distortion figures ever seen in conventional drivers. The dust cap/cover is of the same material as the cone.

The bass drivers operate only over the low frequency range. They are only used over their true piston range. The cone is terminated with a conventional large half roll of synthetic butyl rubber with excellent inherent damping qualities.

A high performance traditional ferrite magnet system is used. Motional noise can be a problem with high output bass systems. We address this by moving air through vents in the voice coil. The magnet system is also fully vented throughout.

THE BASS MIDRANGE DRIVERS (Evo² 30,40,50)

In any system featuring a cone bass/mid driver, performance and dispersion in the upper midrange band is critical, and even more so when (as in our Evo² 30 and 40 models) the midrange driver is crossing over to a dome tweeter, even one with as wide and well maintained a response as our Evo² dome tweeters.

By using a very low mass ultra stiff Kevlar cone in our bass/midrange drivers we provide virtually loss-less energy transfer from the coil ensuring good impulse and dynamic response times. This, combined with a carefully developed cone profile and a precisely shaped central coil cap projection, allows the higher bass and midrange frequencies to provide not just extension but also wide dispersion at the bass unit's upper crossover point. The result is a seamless crossover transition to the tweeter without the compromised off-axis performance usually associated with most 2 way designs.

THE 50mm SOFT DOME MIDRANGE (Evo²-50)

Derived from our flagship 'Airedale Heritage' loudspeaker, we have designed a series of dome mid-range units which are exclusively used in our high-end loudspeaker products. Although costly to produce, the benefits of a using a dome mid-range – particularly one with such a wide bandwidth as our own – are lower distortion through this region, better integration throughout the frequency spectrum and an extremely wide dispersion - all contributing to a very relaxed, natural presentation.

Because each driver in a multi-way system covers a smaller bandwidth, dynamic range and transient response are hugely improved. Often this is at the cost of frequency integration but when our unique dome technology is deployed, integration between upper and lower drive units is virtually seamless.

THE 25mm 1" SOFT DOME TWEETER

The highest frequencies are handled by a soft dome driver. Our extensive research has proven these are a better choice than the metallic based domes that typically add their own character to the treble. A feature of the tweeters, as with the mids, is wide dispersion and very low distortion, again typically less than 1% at 100dB at 1 metre. The unit features a high flux neodymium magnet structure, producing a typical efficiency of 93dB 1W@1m. This unit has a frequency response extending far beyond audible frequencies to around 45kHz.

THE CROSSOVER AND WIRING

High quality OFC cable is used in each loudspeaker for internal wiring. High quality resin fibreglass printed circuit boards are used throughout, and all connections are made to audiophile standards. All inductors used are perfect layering wound and bonded and use large gauge wire for very low insertion loss. All capacitors used are either, low loss, low ERC polypropylene or high quality audio grade reversible electrolytics.

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SPECIFICATIONS



	Evo ² -8	Evo ² -10	Evo ² -20	Evo ² -30	Evo ² -40	Evo ² -50	Evo ² -Centre	EVO ² -DFS
Transducer Complement	2 Way	2 Way	2 Way	2.5 Way	2.5 Way	3 Way	2 Way	2 Way
Cone Bass driver	5" 125mm	6.5" 175mm	6.5" 170mm	6.5" 170mm	6.5" 170mm	6.5" 170mm	5" 125mm x 2	5" 125mm x 2
Cone Bass/Mid Driver				6.5" 170mm	6.5" 170mm	6.5" 170mm		
Soft Dome Tweeter	1" 25mm	1" 25mm	1" 25mm	1" 25mm	1" 25mm	1" 25mm	1" 25mm	1" 25mm x 2
Nominal impedance	6 Ohms	6 Ohms	6 Ohms	6 Ohms	6 Ohms	6 Ohms	6 Ohms	6 Ohms
Impedance variation (Ohms)	4.0 - 17.0	4.0-16.0	4.0-16.0	4.0-17.0	4.0-16.0	4.0-27.0	8.0-22.0	5.0-12.0
Frequency response +/- 3dB	65Hz-28kHz	57Hz-28kHz	50Hz-28kHz	35Hz-28kHz	30Hz-28kHz	30Hz-28kHz	90Hz-35kHz	60Hz-32kHz
Low frequency limit -10dB	45Hz	40Hz	35Hz	35Hz	30Hz	27Hz	60Hz	55Hz
Upper frequency limit -10dB	32kHz	32kHz	32kHz	32kHz	32kHz	32kHz	43kHz	32kHz
SPL 1W @ 1m	87dB	88dB	88dB	89dB	89dB	90dB	89dB	88dB
Typical Distortion - to 300Hz	<7%	<7%	<7%	<5%	<5%	<5%	20-200Hz <4%	20-200Hz <4%
(100dB@1m) - over 300Hz	<1%	<1%	<1%	<1%	<1%	<1%	above 200Hz <1%	above 200Hz <2%
Continuous Programme Power	75 Watts	100 Watts	100 Watts	125 Watts	150 Watts	150 Watts	100 Watts	100 Watts
Recommended Amplifier Power	30-150W	30-200W	40-200W	50-250W	50-300W	50-300W	30-200W	30-200W
Max Peak SPL	107dB	109dB	109dB	111dB	112dB	113dB	111dB	108dB
Nominal coverage horizontal	90 to 12kHz	90 to 12kHz	90 to 12kHz	90 to 12kHz	90 to 12kHz	90 to 15kHz	90 to 12kHz	180 to 10kHz
Nominal coverage vertical	70 to 12kHz	70 to 12kHz	70 to 12kHz	70 to 12kHz	70 to 12kHz	70 to 15kHz	70 to 12kHz	70 to 12kHz
Enclosure type bass/mid	ported	ported	ported	ported / sealed	ported / sealed	ported / sealed	sealed	ported
Volumes bass/mid	10 litres	15.3 litres	23.8 litres	28 / 15 litres	37 / 15 litres	33 / 13 litres	12 litres	8 litres
System Fb	50Hz	50Hz	40Hz	35Hz	35Hz	30Hz	90Hz	70Hz
Crossover frequencies	2.0kHz	2.2kHz	2.2kHz	150Hz,2.2kHz	150Hz,2.2kHz	150Hz,1.3kHz,6.5kHz	2.4kHz	3.kHz
Construction material	15 & 25mm MDF	15 & 25mm MDF	15 & 25mm MDF	15 & 25mm MDF	15 & 25mm MDF	15 & 25mm MDF	15 & 25mm MDF	15mm MDF/Plate
Finish	Satin Lacquer finished real wood veneers of Light Maple, Rosewood, Cherry, Black Ash							
Component part numbers								
Bass driver	13118	17167	17167	17169	17169	17169	13119	13119
Bass/Mid Driver				17168	17168	17168		
Dome Midrange Driver						07104A		
Tweeter	0367	0371	0371	0371	0371	0371	0372	0373
Product dimensions H x W x D	330 x 185 x 336	380 x 227 x 356	890 x 227 x 356	920 x 229 x 400	1110 x 229 x 400	1160 x 229 x 400	185 x 420 x 300	362 x 350 x 162
Net weight	7.0kg x 2	8.1kg x2	15.5kg x 2	20.8kg	24.0kg	25.6kg	8.95kg	4.7kg x 2
Carton dimensions H x W x D	440 x 485 x 375	490 x 575 x 395	1020 x 600 x 410	1060 x 600 x 460	1250 x 600 x 460	1270 x 600 x 460	530 x 340 x 245	428 x 425 x 400
Gross weight	15.5kg	18.5kg	34.5kg	46.0kg	54.0kg	58.0kg	10.0kg	11.5kg

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BASS AND BASS/MIDRANGE DRIVE UNIT SPECIFICATIONS



	17168	17169	17167	13119	13118
	170mm (6.5") Bass	170mm (6.5") Bass/Mid	170mm (6.5") Bass/Mid	125mm (5") Bass/Mid	125mm (5") Bass/Mid
Frame material	Aluminium	Aluminium	Aluminium	Aluminium	Aluminium
Cone & dome material	Woven Kevlar	Woven Kevlar	Woven Kevlar	Woven Kevlar	Woven Kevlar
Surround	s r b p Single roll	s r b p Single roll	s r b p Single roll	s r b p Single roll	s r b p Single roll
Spiders	Single	Single	Single	Single	Single
Coil size & type	25mm Aluminium	25mm Aluminium	25mm Aluminium	25mm Aluminium	25mm Aluminium
Winding spec	4 layer round cu x 11.5mm	2 layer round cu x 11.2mm	2 layer round cu x 15mm	2 layer round cu x 13.6mm	2 layer round cu x 11.5mm
Magnet (D1 x D2 x H)	70 x 32 x 15 ferrite	70 x 32 x 15 ferrite	70 x 32 x 15 ferrite	80 x 32 x 15 ferrite	80 x 32 x 15 ferrite
Magnet weight	106gm	106gm	106gm	168gm	168gm
Gap flux density	0.9 T	1.0 T	1.0 T	1.0 T	1.0 T
Top plate thickness	6mm	6mm	6mm	6mm	6mm
Optimum working range	40Hz – 500Hz	54Hz–4000Hz	54Hz–4000Hz	65Hz–5000Hz	58Hz–5000Hz
Venting	Coil, pole	Coil, pole	Coil, pole	Coil, pole	Coil, pole
Thiele Small parameters	4 – φ4	4 – φ4	4 – φ4	4 – φ4	4 – φ4
Effective cone diameter	140mm	140mm	140mm	105mm	105mm
Re	5.8Ω	5.8Ω	3.4Ω	14.5Ω	3.4Ω
Fs	40Hz	54Hz	54Hz	65Hz	58Hz
Qms	7.13	4.67	4.75	3.32	3.14
Qes	0.69	0.84	0.66	0.68	0.37
Qts	0.63	0.71	0.58	0.56	0.33
Mms	28.11gm	16.62gm	17.17gm	7.26gm	8.01gm
Cms	0.54mm/N	0.51mm/N	0.51mm/N	0.83mm/N	0.93mm/N
Vas	17.76L	16.77L	16.94L	8.64L	9.69L
BL	7.78t/m	6.3t/m	5.48t/m	7.95t/m	5.22t/m



MIDRANGE SPECIFICATIONS

Part number	07104A
Dome material & size	50mm textile
Coil size & type	50mm aluminium
Magnet d1 x d2 x h	48.5 x 20 x 5 Neodymium
Magnet weight	84gm
SPL 1w @ 1m	92dB
Fs	0.00kHz
Frequency range -3dB	600Hz–12kHz
Upper frequency limit -10dB	18kHz
Distortion at 100dB @ 1m	typically < 1%



TWEETER SPECIFICATIONS

Part number	0367
Dome material & size	25mm textile
Coil size & type	25mm aluminium
Magnet d1 x h	25.4 x 4mm Neodymium
Magnet weight	14gm
SPL 1w @ 1m	93dB
Fs	1.3kHz
Frequency range -3dB	800Hz–40kHz
Upper frequency limit -10dB	45kHz
Distortion at 100dB @ 1m	typically < 1%

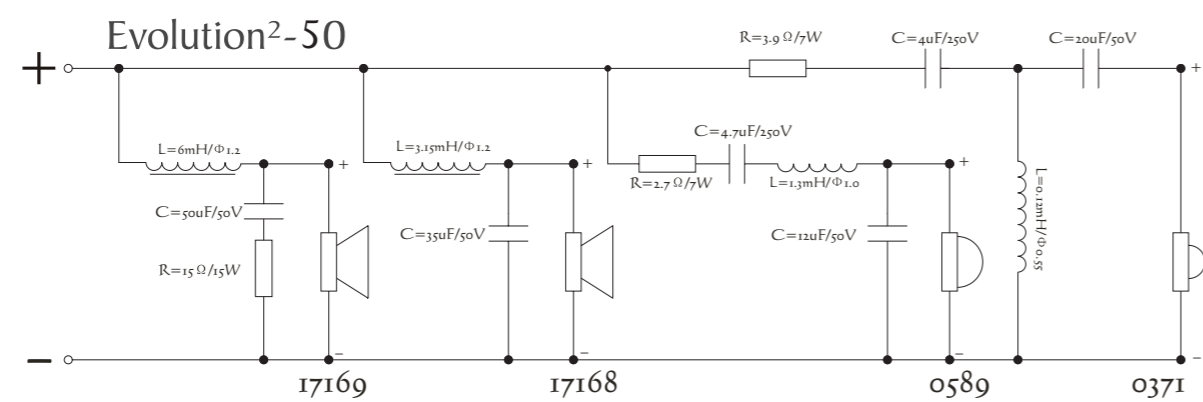
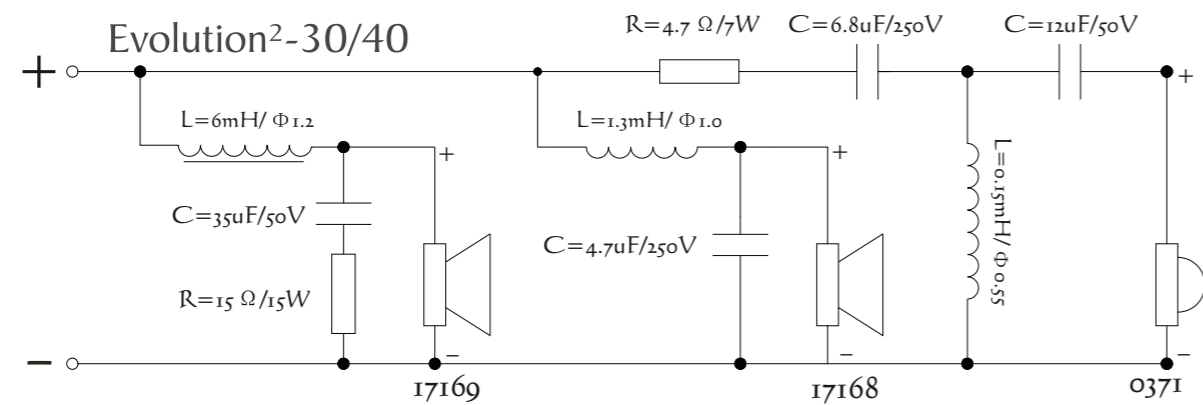
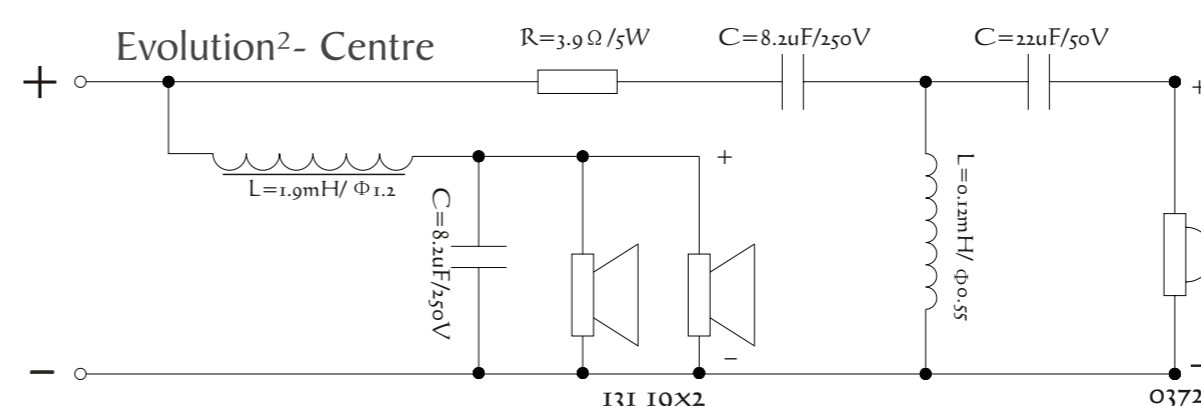
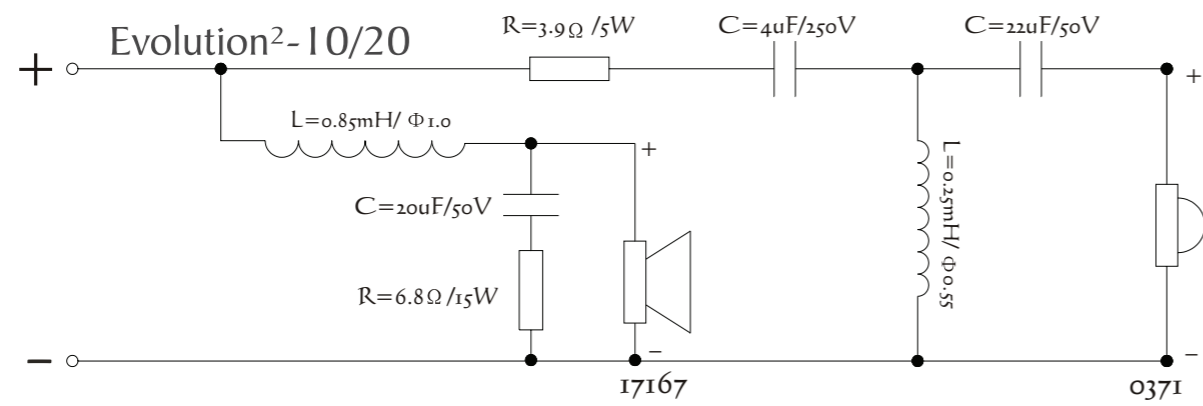
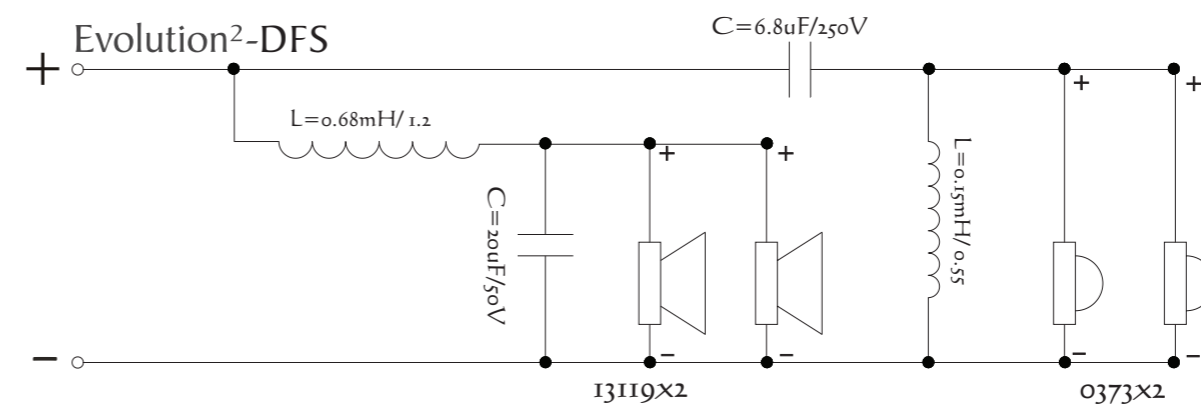
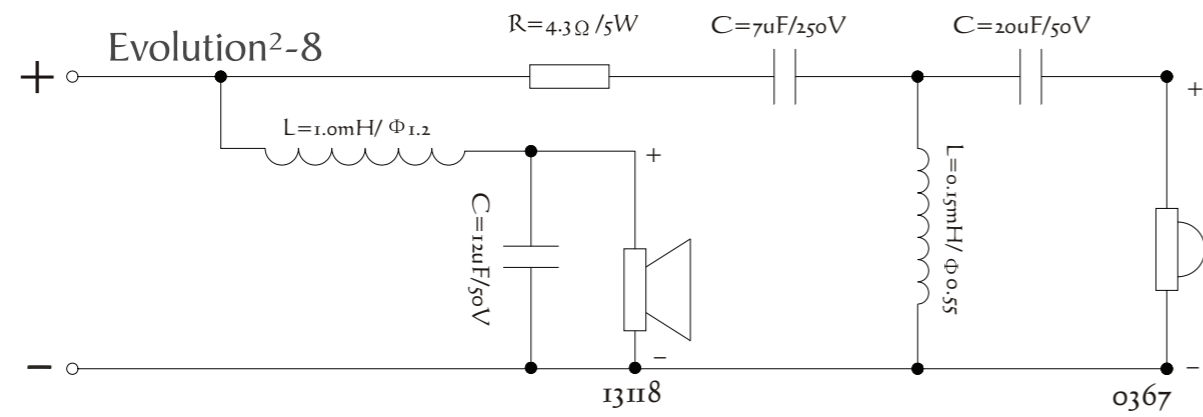


CROSSOVER SPECIFICATIONS

Crossover sections	2 way, 2.5 way, 3 way
Type	Butterworth
Wiring	HQ OFC cable
Connections	solder

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QUALITY MANAGEMENT

Your loudspeakers have been constructed to the highest standards of quality throughout.

The acoustic components and the whole system have been manufactured to very tight tolerances of +/- 1.5 decibel of sound pressure level for each driver throughout the operation range of the unit.

All drive unit components are referenced to the original test record set on file in our factory quality control department. This enables us to give an extended guarantee of identical replacement parts should they ever be required.

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