geometry series

Owners Manual

To the Owner

We would like to thank you for investing in a Wilson Benesch Loudspeaker.

Please return your completed Guarantee Registration Card or use the electronic registration within six weeks of purchase. Warranty conditions can be viewed towards the back of this manual.

For electronic registration please refer to the Wilson Benesch website to take advantage of the Customer Guarantee Registration. You can access the registration area via the 'Owners Section' on the Home Page at: www.wilson-benesch.com

To the Music Connoisseur

To the cognoscenti of British high performance audio, the Wilson Benesch marque is recognised as one of the world's leading loudspeaker design and manufacturing companies. You now own a product that will deliver years of pleasure to all who come across it, within the comfort of your own home. The purchase of a Wilson Benesch loudspeaker is merely the beginning of a long relationship. The Geometry Series loudspeakers are engineered to last a lifetime and are guaranteed for 5 years from the date of purchase. (This guarantee is offered to the first owner only). The care and attention offered by the Wilson Benesch dealer network matches the quality systems that we make. Should you need further advice about cables, set-up, upgrades or any other matters relating to the systems then the dealers are more than able to respond and deal with any of these concerns.

Unpacking & Set-up Instruction

Important points before setting up:

During installation two or more people will be required as the speakers are very heavy. Never attempt to unpack or install the speakers without assistance as this could result in damage to the product or personal injury.

Please observe normal procedures for lifting and correct posture when handling the speakers. Soft fabric gloves are recommended to prevent damage to the high quality finish. Also, it is strongly recommended that all watches and jewellery be removed prior to unpacking. Patient and careful setting up is essential to obtaining the maximum performance from this system.

Move the speaker while in the packaging to the intended listening position. For further information on positioning, see the loudspeaker positioning section. Make sure the top of the box has been fully opened and the hardware pack has been removed.
The speaker is now ready to be removed from the box. Have an assistant help you lift the speaker clear of all packaging. Stand the speaker on the floor, taking care not to damage the foot.

The protective polythene bag can be slippery, so great care must be taken. Once both speakers have been stood up the bags can be removed and the packaging stored for future use. The packaging is essential for shipping the loudspeaker safely so it is highly recommended that the packaging is retained.

Wilson Benesch is distributed by the world's finest distributors and dealers, should you have any problems, they will be able to help and guide you. You may also contact our customer care department via email at any time.

The Subject of Room Acoustics

Acoustics is a complex subject and this text should be treated for what it is, a simple but informative guide. For a more in depth understanding you would need to refer to a whole range of texts on the subject. The most important outcome of this should be a greater appreciation of the role played by the room and surroundings on the overall sound of the audio system. The air contained within the room is the link between the output of the loudspeaker and your ear. How air behaves is dependant upon the attributes or character of the room. It follows that a better understanding of basic acoustics and what facets cause the most influence in the room will assist in making decisions about the way in which the room and subsequently the system can be improved.

Room types fall between two extremes. A room can be 'dead' on the one hand (full of highly energy absorbent materials and complex diffusing structures) or very 'lively' on the other (few reflective surfaces and a high proportion of very reflective, hard, non absorbent surfaces). As so often is the case a balance of materials is commonly preferable to one extreme or the other. The correct balance is the goal for the end user.

Room attributes that can be easily changed

The contents of a room will impact upon its overall acoustic character. As you would expect hard surfaces like glass and concrete tend to reflect a broad band of acoustic energy. Complimentary materials that are soft and thick in section such as heavy natural fibre curtains will tend to absorb a broad band of frequencies.

What are standing waves?

When sound waves reflect between two parallel surfaces, the distance apart being equal to half the wavelength or less, dependant upon wave size, resonance modes referred to as 'standing waves' are created.
In loudspeakers with parallel walls these waves will cause distortions. The standing waves in your room will distort the frequency response of your system sympathetically boosting certain frequencies. If a certain standing wave frequency is acoustically isolated from its modal neighbours its effect is more likely to be audible and problematic. This can compromise the accuracy of any loudspeaker.

Middle & High Frequency Room Characteristics

The middle and high frequencies are affected more by room contents rather than room shape. The surfaces and how they reflect, absorb or diffuse the acoustic energy will tend to describe the 'sound' of a room. Like all energy, acoustic energy cannot be destroyed; it can only be converted into something else or reflected. The shape of the surface will determine how it is reflected and the material will determine whether it is absorbed.

All rooms have a particular sound, and to appreciate what influences are present in your particular room you should be aware of how the objects in your room will respond to sound.

Sound waves behave in the same way as light waves or 'rays' and so imagine the driver to be a floodlight.

Reflection: acoustic energy is not converted but reflected in an orderly, predictable fashion.

Diffusion: acoustic energy is dispersed in a random and/or disordered fashion.
Absorption: acoustic energy is converted into kinetic energy or heat. All or a majority of the sound energy is 'soaked up' or disposed of by the object surface or room boundary

Two Channel Loudspeaker Positioning

There are no objective criteria that can be used to state precisely where loudspeakers should be positioned. Should any individual or company suggest that there are, they should be treated with a great deal of caution. In the global scenario, our loudspeakers are driven by unique systems that are selected by the owner because of particular virtues. Every listening room is as individual and unique in character as the owner. Compound this complex picture with the combination of different equipment. Consider the changeability of rooms; if the room is dressed with heavy curtains simply

changing the curtains position can alter the whole balance of the system. The only rule is that there are no rules. Like producing good wine it is the goal that is the only guide. The owner is the pivot in this subtle balancing act.

The goal of high performance audio systems is accurate reproduction. The information, be it in groove or pit format, should be transcribed, amplified and converted back into sound energy without the additional views of the audio equipment designer being combined with that translation process.

In order to make the task of positioning the loudspeakers less complex we would like to make the following suggestions. The most valuable commodity in this process is time. Be prepared to make small changes over longer periods of time. Select four musical passages that can fulfil the following tests. They should all be stereo recordings.

-Select one with a distinctive and easily heard human voice. Spoken voice is ideal.
-Select one passage with a full orchestra like The Pines of Rome.
-Select one that is very emotional for you.
-Select one that has a strong rhythm, as is the case with dance music for example.

You should appraise the performance of the loudspeakers according to your needs based upon the tests above.

Cinema Systems

There is no industry standard for the positioning of speakers for home cinema, but there are some facts that should be considered when creating such a dedicated environment.

The Tactic II drive units are not shielded and should not be placed within one metre of a cathode ray tube based video display. The angle from the screen should ideally be between 110° and 130°.

Wilson Benesch loudspeakers use identical drive units and tweeters making it possible for a system to be created comprising of more powerful channels at the front of the room and smaller units at the rear and filling in where necessary.

The centre channel is a critical component in any quality cinema system. It handles dialogue to which the ear is very sensitive due to our familiarity with the human voice and more besides.

All Wilson Benesch loudspeakers can be classified as full range systems. Configure the subwoofer for LFE only.

Bi/Tri Amping.

The power that is delivered to your drive units will have a direct effect on the sound of your loudspeakers. You should select the best that you can afford. Separating the systems will deliver benefits that can easily be detected. We would recommend using the same model of amplifier on different drivers.

Bi/Tri Wiring

Improvements can be heard through separating the energy from each filter in the crossover. Cables vary in construction but a good quality cable should be low in impedance, inductance and capacitance. Do not use cables that act as additional crossover components. Experimentation is crucial in this situation and a cable that works well in one situation with a given amplifier may not always perform as well when one of these variables is changed.

Terminals

Wilson Benesch recommends the use of 8mm ring or spade connector cable terminations. A spanner is provided to tighten up the rhodium plated nuts. Please be careful to not over tighten the terminals as this could result in damage to the surrounding materials. The terminals will also except banana plugs.

Spikes

The spikes are supplied installed on the Vertex, so great care should be taken when handling the speaker. By careful tests you can adjust the speaker both in terms of toe in and in terms of vertical angle. Should you wish to adjust either of these factors you should arrange for an assistant to work with you. The position of the tweeter has been designed to function best for listeners seated in conventional relaxed seating positions. If required, for other situations such as listeners on higher seating or standing, the speakers can be tilted back so as to incline the tweeter.

Magnet Precautions

The motors used in all Wilson Benesch speakers are built from the most powerful magnetic material in the world, Nd.Fe.B. Do not bring any metallic objects or sensitive electronic, electromagnetic or mechanical systems into close proximity of these devices. This includes pace makers or other critical devices. The company cannot accept responsibility for any damage or injury caused to any such systems as a result of accidental exposure. Extreme care must be taken with all Wilson Benesch Isobaric speakers as the driver motor is exposed in these systems.

Running In Time (70 hours)

Like anything of good quality a period of running in tends to see improvements in performance. The speaker cabinet requires time to settle in to its surroundings. Climatic and humidity variations will take time to adjust to and until these changes have been made the speaker will not perform at its best. The drivers require time to bed in physically and relax materially.

The carbon panels actually improve in structural integrity as they age. The quality of the sound that you hear when you first use your Wilson Benesch speakers will improve quite significantly over time, though this change will not be instantly perceptible. Allow at least seventy hours of running in before making any subjective judgements of the speaker's performance.

Surface Finish

Carbon fibre is a unique material with unusual physical and visual characteristics. We like to remain truthful about the fibrous nature of the material as opposed to concealing or obscuring it. The surface finishes applied to all Wilson Benesch loudspeakers require no further attention other than the occasional dusting. Treat the driver cones with respect and they will last a decade with relative ease. With a little care the speakers will look as good in ten years as they do today and will probably sound even better.

Other Adjustments

Under no circumstance should you make any adjustment to the system's parts. Any adjustments not described as required by the setting up procedure will nullify all guarantees.

Should there be any question regarding the performance of this system you should refer to your dealer immediately for advice and/or assistance. If in the unlikely event that the problem cannot be dealt with by your dealer do not under any circumstances return the goods to Wilson Benesch without prior agreement with the company.

Magnet Precautions

The motors used in all Wilson Benesch speakers are built from the most powerful magnetic material in the world, Nd.Fe.B. Do not bring any metallic objects or sensitive electronic, electromagnetic or mechanical systems into close proximity of these devices. This includes pace makers or other critical devices. The company cannot accept responsibility for any damage or injury caused to any such systems as a result of accidental exposure. Extreme care must be taken with all Wilson Benesch Isobaric speakers as the driver motor is exposed in these systems.

World Wide Warranty

Wilson Benesch offers a 5 year conditional warranty to the end user. It is done in collaboration with our distributors.

The conditions of this warranty are:

-That Wilson Benesch receives the necessary registration details from the end user.
-That these details are received within six weeks of purchase.
-The warranty is only valid for the first owner and is not transferable.
-That it is limited to the repair of the equipment only.
-That any claim is accompanied by the necessary proof of purchase.
-That cover does not extend to damage caused by faulty or unsuitable ancillary equipment.
-That the serial number has not been altered, deleted, removed or made illegible.
-That the product has not been abused or modified in any way.
-That is was purchased originally from a Wilson Benesch authorised dealer.

If the equipment is being used in the country of purchase, you should contact the Wilson Benesch authorised dealer from whom the equipment was purchased.
If the equipment is being used outside the country of purchase, you should contact the Wilson Benesch national distributor in the country of residence who will advise where the equipment can be serviced. You can call Wilson Benesch in the UK or visit our website to get the contact details of your local distributor. To validate your warranty, you will need the original sales receipt or other proof of ownership and date of purchase. Should you have any queries regarding the product or set-up, do not hesitate to contact us.

From all at Wilson Benesch, we hope you enjoy your new Geometry Series loudspeakers.

The Geometry Series

The Geometry Series pays homage to the importance of geometry in all good design. With the Geometry Series Wilson Benesch applies these principles, with passion, to Acoustic Engineering.

Whether it is the curves in a musical instrument, a large auditorium or an aircraft, geometry is the fundamental language of good design. The Greeks, who defined the rules of geometry, applied their geometric forms to Architecture. Curved amphitheatres allowed public discussion long before any loudspeaker.

The Geometry Series aspires to be the evolutionary development of the time tested Odyssey Series that is now in its tenth year. This collection provides the summation of many years of considered thought and re-evaluation, encouraged in part, by new technologies and new manufacturing capabilities.

Assembled by hand, each high performance material is bonded to another high performance element, resulting in extremely high levels of mutual self damping. The resulting complex hybrid construction is virtually inaudible, exhibiting one of the lowest signal to noise ratios of any loudspeaker in the world, yet is capable of delivering all the dynamic energy from the ultra powerful drive units.

The degree of control that can only be found when every single component is manufactured in house, legislates that matching of both cabinet and drive unit is axiomatic. Manufactured on high precision C.N.C tooling and advanced carbon fibre moulding techniques, each hand built system, is lovingly assembled by highly trained experienced technicians, to the highest standards.

The Tactic II mid range drive unit is capable of remarkable transients that are never hindered by crossover parts. The control afforded by this design is limited only by the amplifier. Impedance characteristics are benign, so low power amplifiers can be driven with aplomb. A quintessential design feature of all Wilson Benesch designs has been the 2.5 way crossover. This ensures seamless integration from the lowest bass to the highest mid range, with the absolute minimum of phase distortion. Designed to function in complete harmony the Semisphere Tweeter then takes over.

Free of the noise commonly found in traditional loudspeaker systems, the Geometry Series Loudspeaker delivers a performance that is well beyond its dimensions, and completely free of distortions that always exist in conventional technologies.

Immersed in music without distortions, the listener will be drawn into the event like never before. Only the artist who composed it and the musicians that interpreted it will be present at the event.

The Wilson Benesch Tactic II Driver

Thanks in part to our collaboration with Sheffield Hallam University, we have been able to draw upon both the academic expertise, as well as the most advanced analysis techniques, to develop a new motor system. Each iteration in the design has been Modelled, prototyped, and then validated in an iterative process of improvement. This process of optimisation, ensures that every single line of flux is acting in a positive way and is delivered precisely to the gap. When compared to its predecessor, Tactic II sees almost 50% more magnetic force from the 10mm thick high quality rare earth magnet. Coupled with the fully optimised high iron content motor geometry the efficiency has been elevated by 3dB.

Due in part to superior inductance characteristics and 30% lower mass, the cleverly designed coil and former, delivers transient response characteristics that significantly outperform its predecessor. These are a few of the improvements, that when combined, take the superb qualities of the Tactic to new levels, that are above and beyond what was previously possible.

The Wilson Benesch Semisphere Tweeter

The Semisphere comes out of one of the longest developments in the company's history, dating back to the first drive unit ten years ago. It has grown slowly out of everything that we have learned from the best tweeters in the world, including the remarkable Piezo tweeter sourced from Murata, the Sphere.

The Semisphere takes its starting point from soft dome technologies, where damping guarantees that the sound will remain clean and notable, without sounding hard or tiresome after a short period of listening. In every way the character is both natural and convincing.

Transient response characteristics are absolutely outstanding, thanks to the advanced materials technologies and their extremely low mass, being almost one third of the previous tweeter that it supersedes.

The dome is driven by one of the most powerful rare earth motor systems in the world. Careful attention to air flow, sees venting at both the side of the coil and rear, allowing any unwanted energy to pass unhindered into the huge silencing chamber.

The high mass of the system which is bolted to the alloy baffle ensures that the first resonance of the structure is close to 6000 Hertz. The tweeter alone weighs over a Kilogramme, but when coupled at high pressure to the poly alloy cabinet, the mass is huge, exerting a level of control over the sound of the tweeter that is beyond compromise.

The A.C.T. Moncoque

The key benefit of the A.C.T. monocoque is the extremely low level of radiated energy. When designing a loudspeaker, the pursuit of stiffness can often conflict with the equally important need for damping. Stiff materials push up the first natural resonant frequency, while materials with high natural damping characteristics help to dissipate any unwanted resonances that do occur. The A.C.T. moncoque is totally unique in being able to set benchmark performance in both these key parameters.

Created by Wilson Benesch over a decade ago, this Advanced Materials Technology is based upon a woven carbon fibre, combined with an arched geometry, and it remains the industry standard in performance. The A.C.T. moncoque is highly complex being comprised of layers of energy absorbing materials. Carbon fibre has two key properties which set it above other materials for loudspeaker cabinets; extremely high stiffness, combined with low mass. The result is industry standard measurements in terms of first resonant frequency, giving carbon fibre an outstanding signal to noise ratio. Low frequency sound in particular, is extremely accurate.

The first resonant frequency is above even the limits of the mid range drive unit, so the low frequency anti-phase noise is easily controlled. Not only is the sound that is radiating from the back and sides of the enclosure very low, it is also very close to the time constant of the original signal. This is due to the extremely high velocity of sound transmission that is typical of carbon fibre. High frequency energy is also well damped by billions of carbon fibre micro-fibre, allied to the advanced core materials that you will commonly found in blast protection structures in aerospace design. The arched geometry of the monocoque structure, will govern that any high frequency energy that does radiate, will be perpendicular to the surface and so away from the listener.

The structural integrity of the A.C.T. monocoque ensures that the energy generated by the drive unit, is transferred to the air and not the enclosure, where it inevitably manifest itself as noise. A particularly stiff material will not have good damping characteristics and vice versa. Wilson Benesch has always engineered hybrid or composite loudspeaker construction. Each material with its own resonant signature mutually damps its neighbour within the loudspeaker assembly. This ultimately leads to each part being perfectly suited to make its contribution, whilst limiting resonances within the overall performance of the loudspeaker.

The Vector is a 2.5 way, highly optimised, advanced materials technology, floorstanding loudspeaker. Thanks to the cleverly engineered A.C.T. monocoque / poly alloy shell structure, complex bracing is no longer accepted as a design compromise. The shell design delivers huge amounts of air volume despite its small external surface area, which is another key factor in the success of the design.

Technical Specifications

Description	2.5 way, true linear phase, free space, ported enclosure, floor standing monitor
Drive units	1 x 170mm (7") Wilson Benesch Tactic II Mid/Bass unit 1 x 170mm (7") Wilson Benesch Tactic II Bass unit 1 x 25mm (1") Wilson Benesch Semisphere Soft dome Tweeter
Low frequency loading	Bessel alignment of fourth order reflex. Double chamber differential tuning
Frequency range	-6dB at 30Hz and 35kHz -3dB at 35Hz and 25kHz
Frequency response	35Hz to 30kHz +- 2dB on axis
Sensitivity	89dB spl at 1metre on axis. 2.83V input
Impedance	6 Ohms nominal, 4 ohms minimum
Crossover	First Order tweeter crossover First Order Bass roll-off Selected polypropylene capacitors and air cored inductors
Crossover Frequencies	500 Hz / 5 KHz
Internal wiring	Hand-made loom comprised of Multi stranded military specification silver plated copper with PTFE jacket soldered connections throughout.
Input connections	Bi-wireable, in house machined rhodium plated copper alloy terminals
Maximum spl	118dB at 1 metre
Power handling	200W peak unclipped programme
Height	910mm
Width	230mm
Depth	370mm
Internal Volume	44 litres
Net Weight	31Kg

The Vertex is a 2 way, highly optimised, advanced materials technology, stand mounted loudspeaker. Unlike many stand mounted designs, the Vertex and its stand work in harmony to attain structural integrity. Mounted with high tensile bolts, the speaker and stand become one. The cleverly engineered Vertex conceals and protects both the wire and crossover elements within the stand, avoiding all problems associated with conductor and filter resonance, whilst also providing shielding.

Technical Specifications

Description	2 way, true linear phase, free space, ported enclosure, stand mounted monitor
Drive units	1 x 170mm (7") Wilson Benesch Tactic II Mid/Bass unit
	1 x 25mm (1") Wilson Benesch Semisphere Soft dome Tweeter
Low frequency loading	Double reflex port tuning
Frequency range	-6dB at 40Hz and 35kHz
	-3dB at 45Hz and 25kHz
Frequency response	44Hz to 30kHz +- 2dB on axis
Sensitivity	89dB spl at 1metre on axis. 2.83V input
Impedance	6 Ohms nominal, 4 ohms minimum
Crossover	First Order tweeter crossover Selected polypropylene capacitors and air cored inductors
Tweeter Filter	5 KHz
Internal wiring	Hand-made loom comprised of Multi stranded military specification silver plated copper with PTFE jacket soldered connections throughout.
Input connections	Bi-wireable, in house machined rhodium plated copper alloy terminals
Maximum spl	118dB at 1 metre
Power handling	200W peak unclipped programme
Height	310mm (1050mm including stand)
Width	230mm
Depth	370mm
Internal Volume	11.8 litres
Net Weight	12Kg (23Kg including stand)

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