ATOHM®

| SIROCCO SERIES |

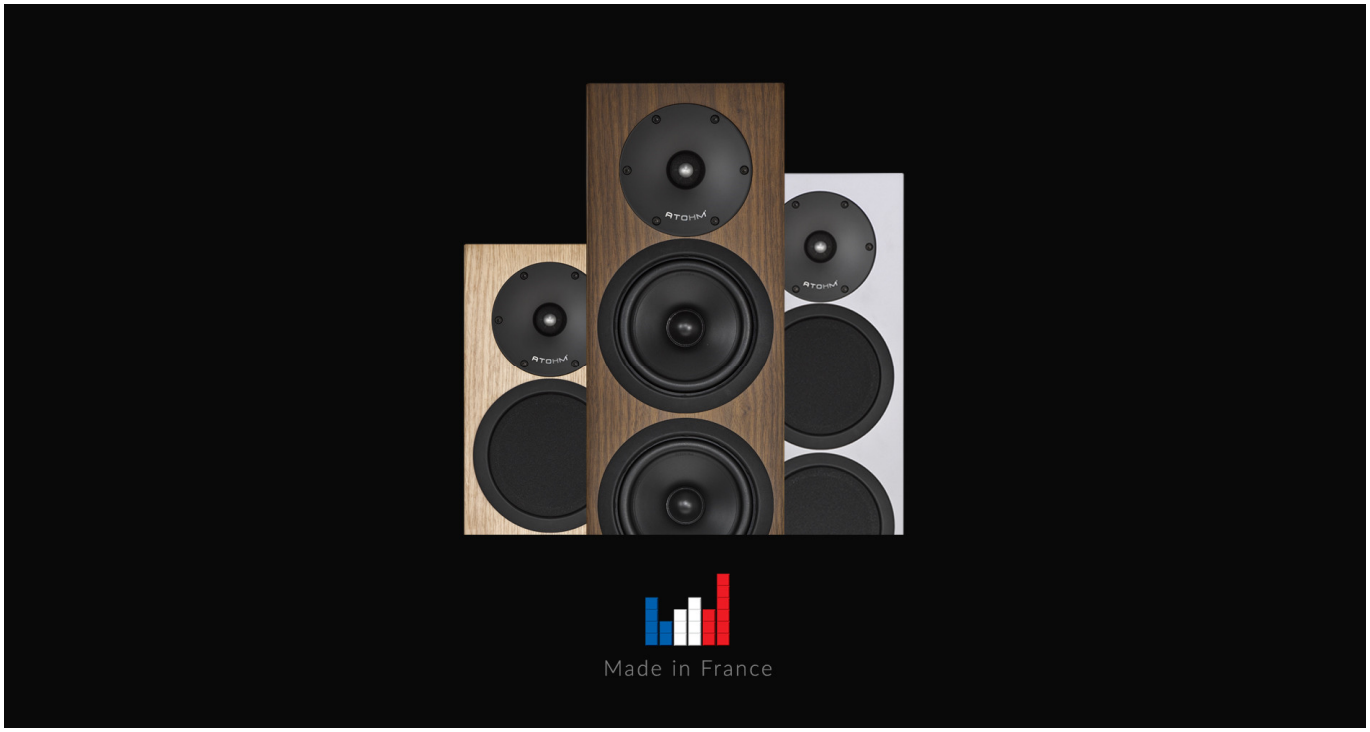
Our passion for music, sound reproduction, audio engineering, and elegant aesthetic design inspires every step in the creation of our products. Since 2002, with the launch of our very first speaker, the "SIROCCO," followed in 2007 by the "SIROCCO SERIES," this name of a warm and powerful wind has symbolized our commitment: to offer speakers with high performance-to-price ratios while making them accessible to many people.

This new "2024" series continues the legacy of the line by retaining the iconic "SIROCCO" name. However, drawing on over 25 years of experience and leveraging all our engineering and production tools, we have completely redesigned its concept: brand-new drivers, new enclosures, new crossovers, and a new advanced design—all with the sole aim of significantly enhancing the technical and musical performance of our speakers in this price range.

The excellence of a loudspeaker fundamentally depends on the performance of its drivers, which are its very core. However, their implementation plays an equally crucial role. In the low-frequency range, the results achieved are directly tied to the capabilities of the drivers and their interaction with the enclosure. Optimizing this coupling is therefore essential. The design and fine-tuning of the filters, in alignment with the characteristics/radiation of the drivers, their arrangement, the baffle geometry, and the enclosure, are critically significant.

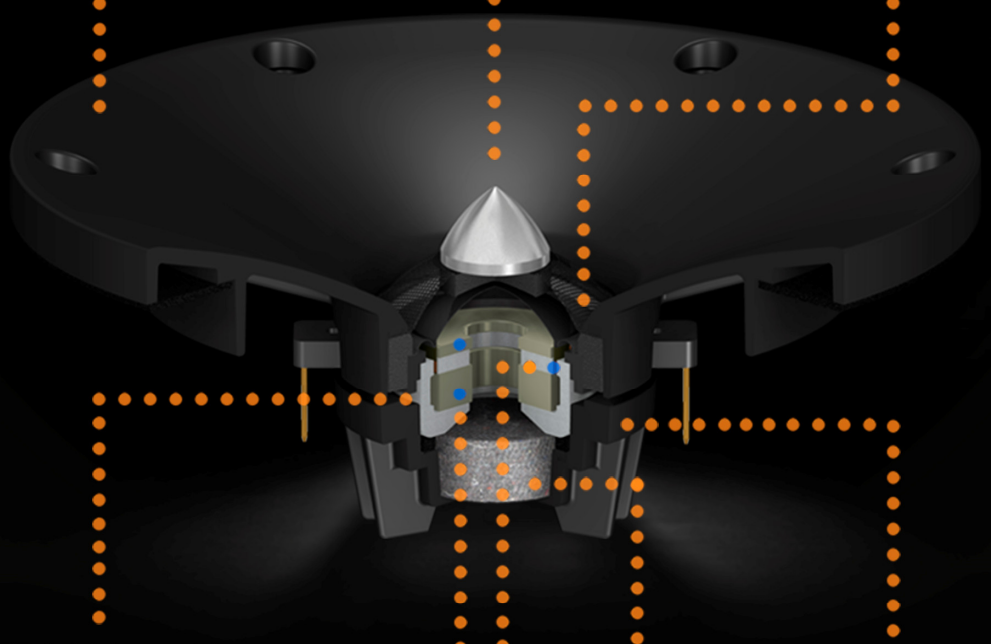
This technical booklet outlines some of the innovations, engineering and technological choices we have developed and incorporated, in our drivers and in the acoustic enclosures and filtering. These advancements are designed to ensure exemplary performance in terms of linearity, dynamics, reduced distortion, and power handling, with the primary goal of immersing the listener in intense and unique musical emotions.

Thierry COMTE



Made in France

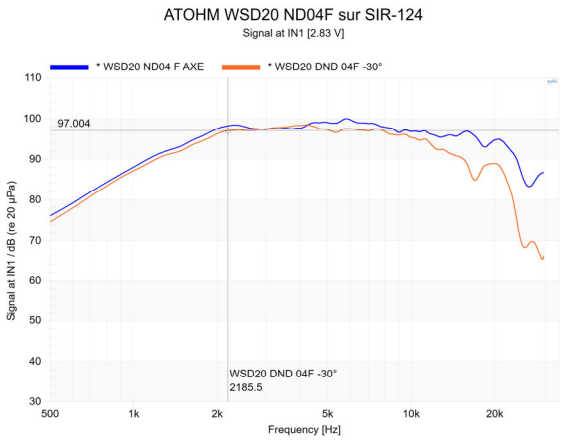
WSD20 tweeter
High efficiency & time alignment



ATOHM® ADVANCED DRIVER TECHNOLOGIES

Equipped with a lightweight 20 mm silk dome featuring progressive breakup characteristics, the WSD20DND04F tweeter includes an optimized waveguide crafted from die-casting molded aluminum to eliminate vibrations and align its temporal origin closely with that of the C150 mid-woofer. Paired with a precisely calibrated phase equalizer, it enhances efficiency and delivers a nearly constant directivity across the entire frequency range, ensuring highly refined and accurate sound reproduction.

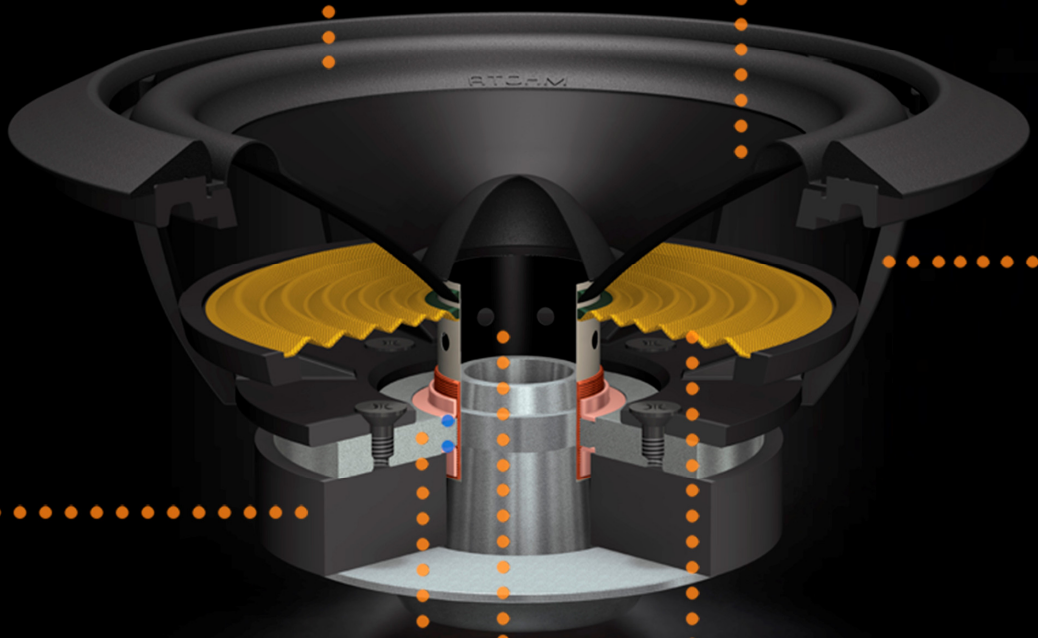
The motor assembly, optimized through extensive dynamic simulations (FEA) and prototypes, incorporates a dual neodymium ring of extremely high-grade ND52H, generating a magnetic flux of **14,500 gauss in a tall gap. This ensures linearity (excursions of +/-0.25 mm) and optimal thermal dissipation. The CCAW voice coil, shorter than the gap, combines lightness and strength, with an ultra-thin aluminum former for improved rigidity and thermal conduction. Ferrofluid significantly enhances heat dissipation and contributes to damping.** The vented motor opens into an injection-molded aluminum rear chamber, aiding in heat dissipation and **precisely calibrated to absorb the rear wave. This design helps to control excursions and reduce distortion in low frequencies outside the unit's operational range.**



With a high sensitivity of 97 dB/2.83V/1m, this tweeter is designed to deliver remarkable performance and reliability. **Once integrated into the speaker system, its output level is deliberately attenuated by the crossover (by 4 to 8 dB, depending on the switch setting on the rear panel) to match that of the mid-woofer it accompanies.** The thermal power handling of a tweeter, typically lower (by a factor of 2 to 4) compared to that of a mid-woofer, is compensated here by this attenuation. This reduces the power delivered to the tweeter by a similar proportion, **thereby harmonizing the dynamics between the different units.**
This approach ensures optimal sound reproduction, reduces distortion and thermal compression in the high-frequency range, and provides consistent power handling across the entire speaker bandwidth, thereby enhancing the system's overall reliability while preserving it accuracy for the signal.

Each component of this tweeter is manufactured with exceptional precision, and its assembly in our workshops receives meticulous attention to detail. Quality control includes a frequency sweep test as well as five measurements conducted in a mini anechoic chamber. These checks enable us to classify the tweeters by sensitivity and **pair them with a precision of +/-0.25 dB before integrating them into the speakers.**

C150 mid-bass
High performance unit



Controlled breakup surrounding LDS™ technology

Reinforced paper cone with specific damping treatment

Fully F.E.A. optimized magnetic structure.

Double thermal and inductive control ring TICR™ technology

High-rigidity AL voice coil former with forced ventilation and thermal dissipation

Progressive geometry spider M-GUARD™ technology ("mechanical soft clipping")

Die-cast aluminum frame with large rear cutouts

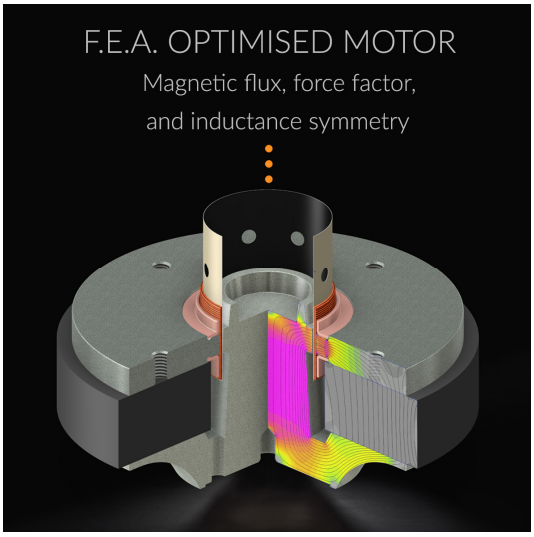
ATOHM® ADVANCED DRIVER TECHNOLOGIES

One of the very first ATOHM® drivers, the LD130, was developed in 2000–2001. The new C150 DCR units draw inspiration from this benchmark, retaining its key characteristics: intended use, diameter and basket mounting, membrane type, and a ferrite-based motor. However, leveraging the experience gained over the years and all the modern development tools we have, the driver and all its components have been completely redesigned to achieve performance that is superior in every aspect to its predecessor.

Offering an excellent balance between stiffness, weight ratio, and damping, these new units feature a special "paper" cone made of oriented short fibers. **A specific rear treatment complements this design to optimize and dampen cone breakup at higher frequencies, thereby improving response linearity and simplifying the crossover tuning process.**

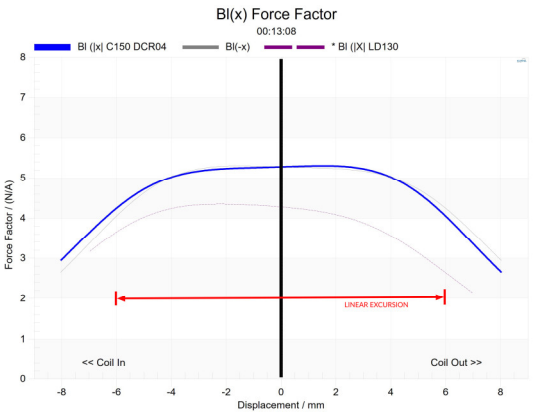
The NBR rubber surround incorporates LDS™ (Low Diffraction Surrounding) technology, **enabling progressive breakup in the midrange for a more linear frequency response.** Its optimized geometry ensures symmetrical stiffness during maximum excursions while reducing the moving mass.

Drawing on many years of experience and advanced electromagnetic simulations (F.E.A.), the motor assembly features an 84 mm ferrite magnet paired with optimized pole pieces and a 25 mm voice coil. **The chosen geometry maximizes magnetic flux concentration in the gap, delivering a high, constant, and symmetrical force factor (BL) over a wide excursion range, resulting in remarkably powerful and pure bass without any artefact.**



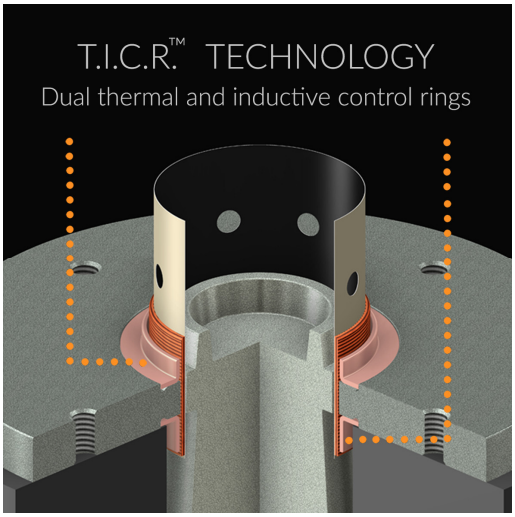
In a loudspeaker, the alternating magnetic flux (AC) generated by the voice coil disturbs or modulates the static (DC) flux of the magnet, which should ideally remain completely constant. This modulation, proportional to the input power, can reach up to ±20% (or more), making the loudspeaker unstable (dynamic shift of the resting position) and producing significant audible distortions (harmonic and intermodulation).

To reduce this problem, a copper or aluminum ring is often added to the core. It acts as a shield by creating an opposing field that reduces the impact of the AC flux, particularly in the mid and high frequencies. However, the thickness of this ring widens the magnetic gap, decreasing the static flux by up to 20% and resulting in a sensitivity loss of approximately 0.7 to 1.5 dB. Paradoxically, in low frequencies, this reduction in flux can exacerbate the parasitic modulation that the ring is unable to counteract.

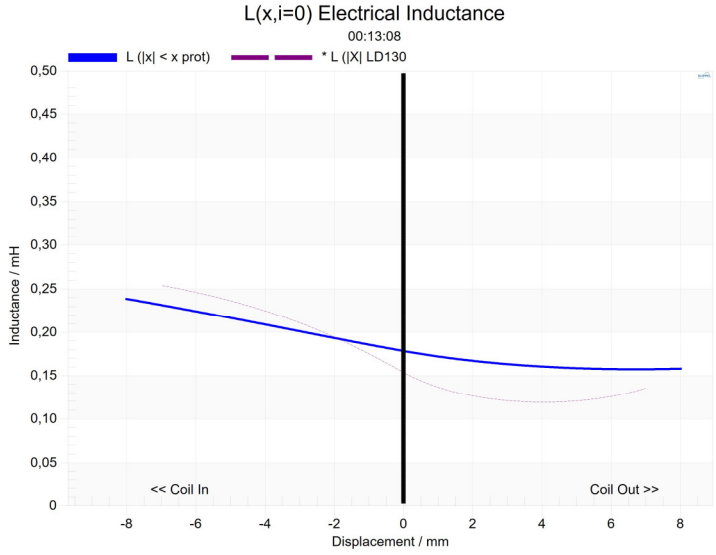


Overall motor force factor (BL) depending on the excursion (mm)

From another physical perspective, a loudspeaker's thermal capacity depends on the size of its voice coil and the nearby metallic pole pieces. Simply put, for a given coil diameter, a thicker pole plate improves thermal dissipation and power handling.



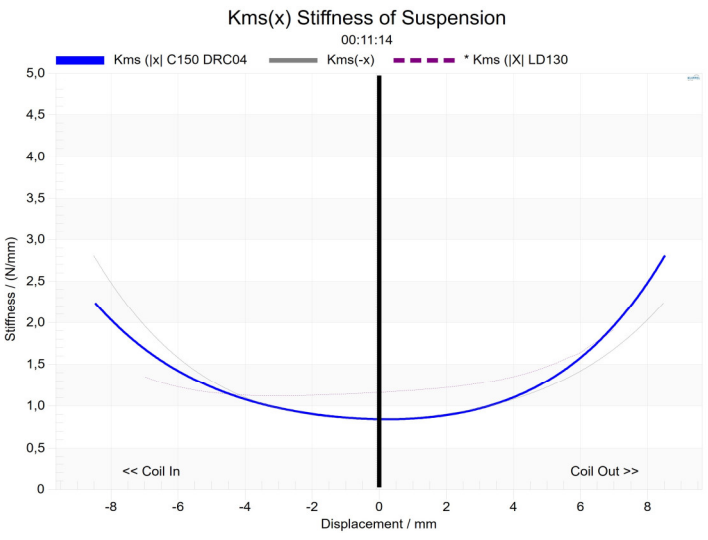
The exclusive TICR™ (Thermal & Inductive Control Rings) technology, developed by ATOHM®, incorporates two specialized copper rings symmetrically positioned around the voice coil on the pole plate. **This design combines electromagnetic control and thermal dissipation to deliver optimal performance. It reduces and linearizes the inductance value without decreasing the magnetic flux density in the gap, thereby minimizing all flux modulation-related distortions while maintaining the speaker's efficiency. Furthermore, when paired with a ventilated aluminum voice coil former, TICR™ technology increases thermal dissipation capacity by more than 25%, resulting in enhanced dynamics and improved reliability.**



Coil inductance value as a function of excursion (mm)

The spider plays a key role in centering the voice coil and controlling excursions in low frequencies. Acting as a spring, it centers the coil and returns it to its resting position in the absence of a signal. To prevent distortions, its stiffness coefficient (Kms) must remain constant across the entire excursion range. However, under heavy demand, the coil may exceed the limits of linear excursions, leading to increased distortion, bottoming out, or even destruction.

To balance linearity and dynamic behavior under heavy loads, we developed the **M-GUARD™ technology**, which combines a specific "progressive" geometry with a material featuring low transient creep. This design, requiring precise fine-tuning in relation to motor/coil height characteristics, maintains a **nearly constant stiffness coefficient across the nominal excursion range (+/-6 mm) and gradually increases it beyond this point, reaching more than three times its value at +/-12.5 mm (*).** Acting as a progressive limiter or "mechanical soft clipping," **M-GUARD™ allows the driver to handle up to an additional 6 dB of voltage (4 times increase in power) without too significant audio degradation, while extending the absolute limit by an additional 2 dB, thereby enhancing reliability.** This system reduces excessive excursions, **preserving a dynamic margin for the rest of the frequency spectrum.**

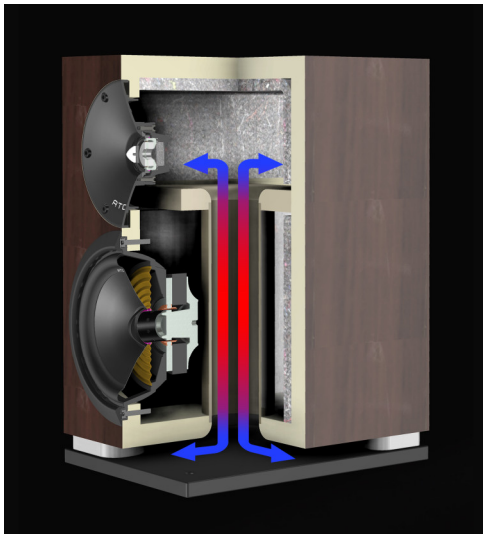


Overall total suspension stiffness coefficient (Kms) depending on the excursion (mm)

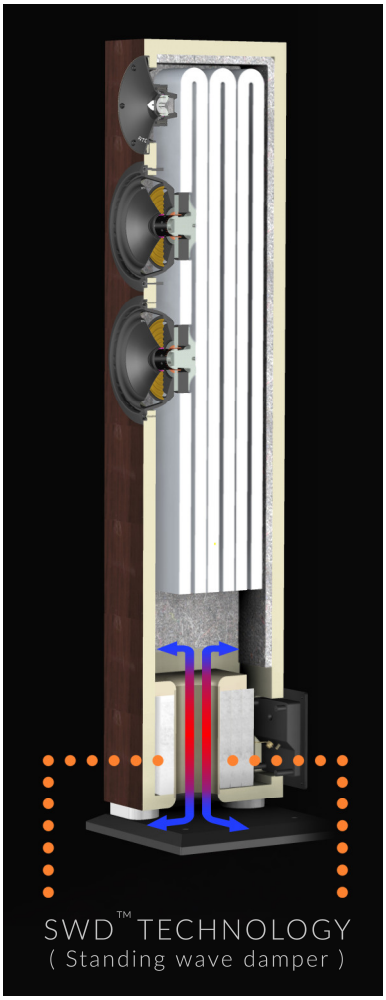
(*) Based on destructive tests conducted in the laboratory—C150DCR04 mid bass unit version tested in free air—failure occurred after 5 seconds at 35Vrms @ 30 Hertz (approximately 300 Wrms)! Do not attempt to replicate.

To ensure the required rigidity and precision, the frame is also made of die casting -molded aluminum. Firmly supported and securely screwed onto the pole plate, **it actively contributes to the cooling of the unit**. Carefully designed, it ensures the optimal positioning of the motor, spider, and suspension at ideal relative heights. Additionally, **its large openings beneath the cone and spider** are generously sized to eliminate any interference with the rear wave.

The entire speaker assembly process is carried out in our workshops with meticulous precision and exceptional care. **Adhesives are applied using high-precision dispensers, with systematic control of the exact quantities deposited.** At the end of production, and **after magnetization**, each speaker undergoes a series of rigorous tests to ensure its quality before being integrated into the loudspeakers, maintaining ATOHM's commitment to high quality control.

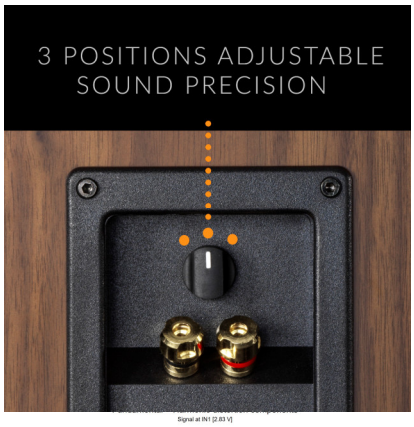


Crafted from 18mm MDF, the SIROCCO SERIES speakers utilize a bass-reflex design. **The ports are positioned vertically at the base of the speakers, allowing for maximized cross-sections and lengths, which reduce turbulence and associated airflow compression.** Placed at a distance from the drivers, their openings avoid any source of reflection or diffraction, unlike ports located near the cone. **The tuning frequencies and total internal damping have been meticulously calibrated to ensure optimal balance and performance in the low-frequency range.**

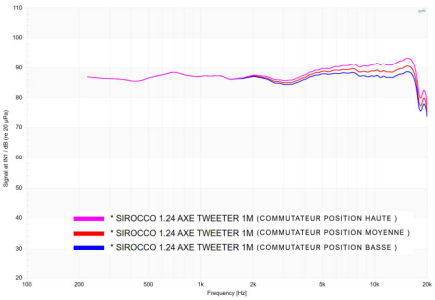


With their vertical "tube-like" geometry, floorstanding speakers are prone to pronounced resonances in this direction. These standing waves, which are difficult to eliminate through simple wall angling or excessive damping, can be exacerbated by the placement of the drivers and the crossover design. They result in significant degradation and audible ringing in the 130–300 Hz range.
To address this issue, ATOHM® floorstanding speakers incorporate our **SWD™ (Standing Wave Damper) technology**, which uses a laminar absorption cavity located at the base or top of the cabinet. **This system, consisting of an acoustic filter and a damping volume, effectively neutralizes resonances, delivering a clean upper-bass and lower-midrange free of unwanted coloration.**

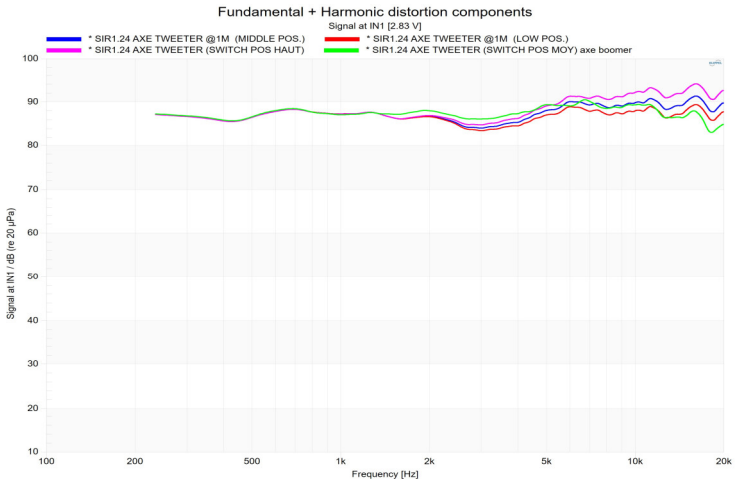
Thanks to their design, **the driver units have significantly time-aligned origins on the vertical plane. They also provide a response suited for the use of soft-slope filters, promoting gradual transitions in the directivity lobes for more natural sound reproduction. The crossover is based on simple 6 dB/octave structures, complemented by impedance compensation circuits to ensure precise electrical slopes, optimize the resulting acoustic slopes, and maintain compatibility with a very wide range of electronics.** As for the components, they are carefully calibrated and meet specific quality standards according to their application (air core inductors, MPT capacitors, low-resistance laminated steel inductors, etc.). The internal wiring is made from specific 1.5mm² multi-strand OFC cable.

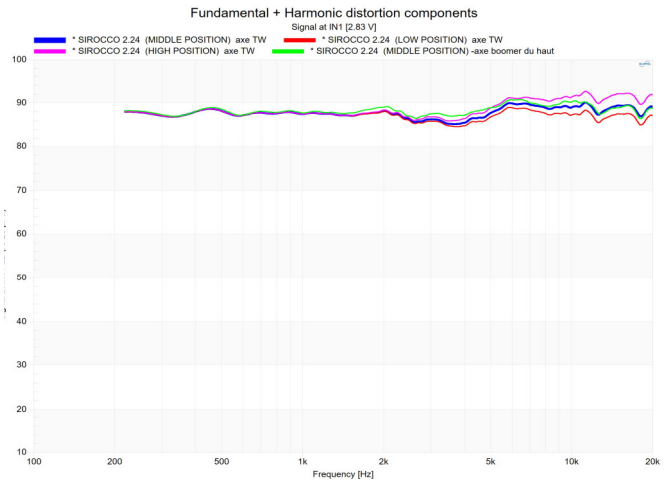


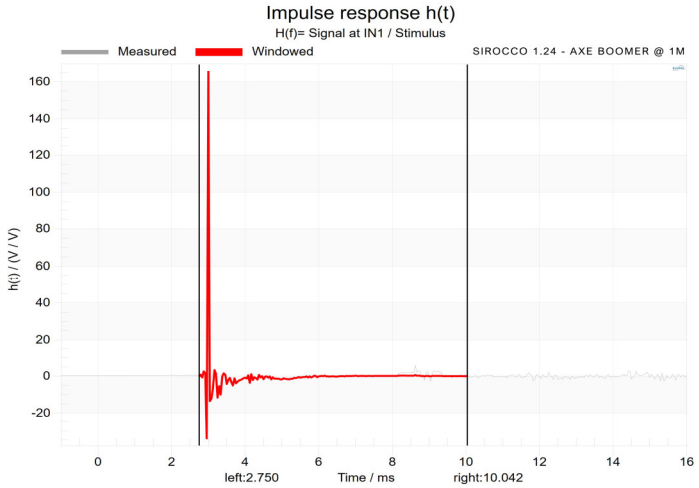
Due to the compact size of the baffle (see front face), a slight equalization is applied to the mid bass unit(s) to ensure a smoother transition between the omnidirectional radiation of the low frequencies (360°) and the directional radiation of the midrange (180°).
The perceived sound balance depends on the room acoustics, speaker placement, distance, listening level, and associated equipment such as the amplifier and audio sources. As mentioned earlier, the high frequencies are attenuated to a significant degree. **This attenuation is adjustable through a 3-position switchable attenuator, with 2dB steps. This system allows the user to tailor the frequency response according to their preferences and the specific acoustic conditions of their environment.**

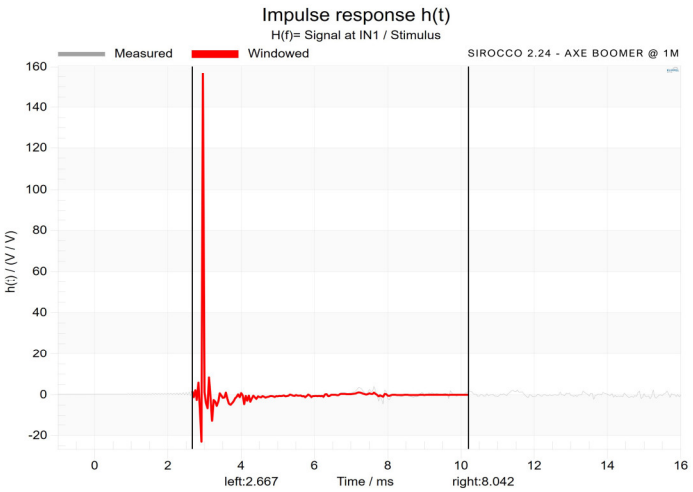


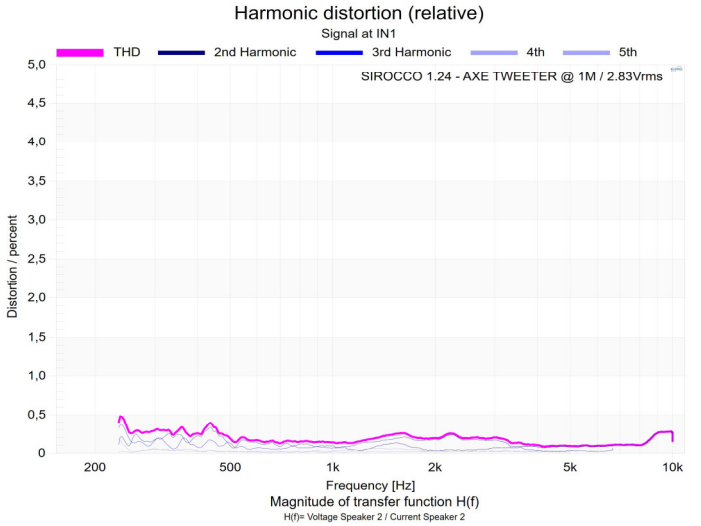
Measurements and technical specifications

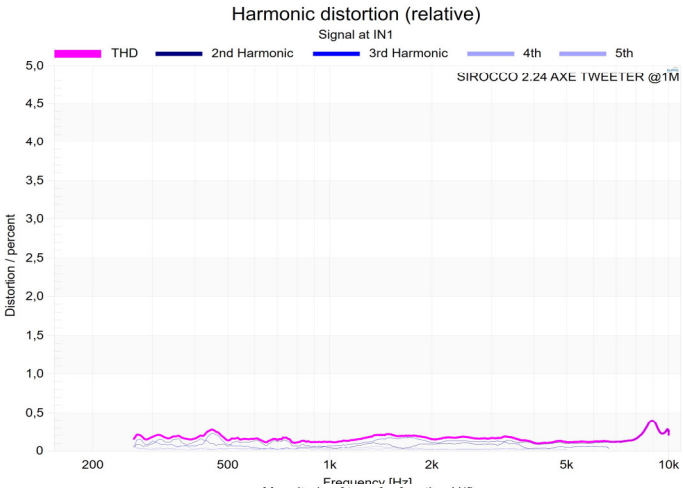


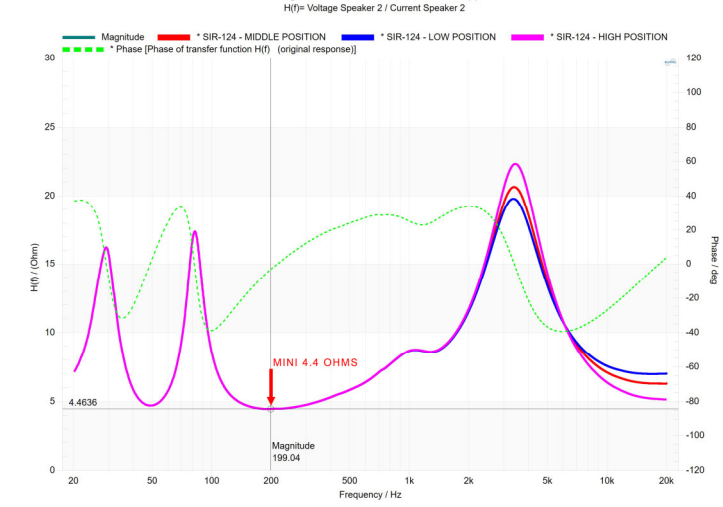


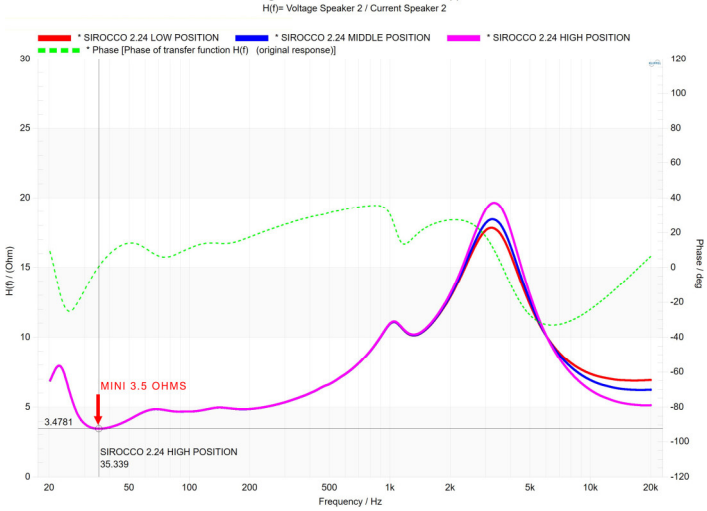


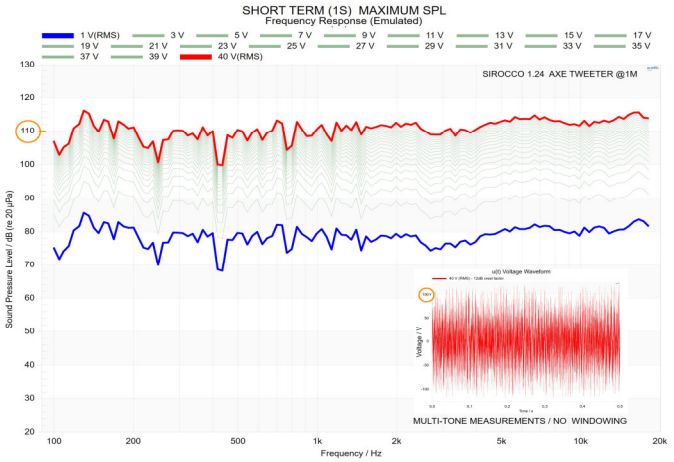


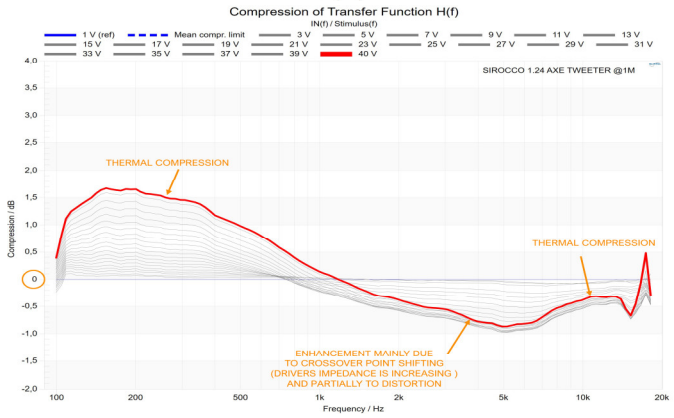


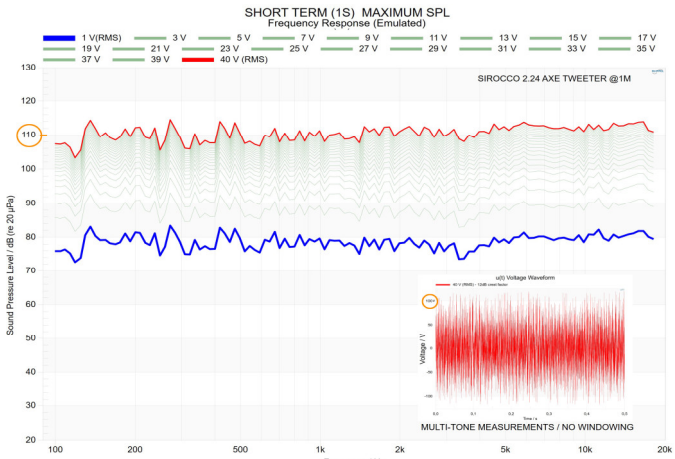


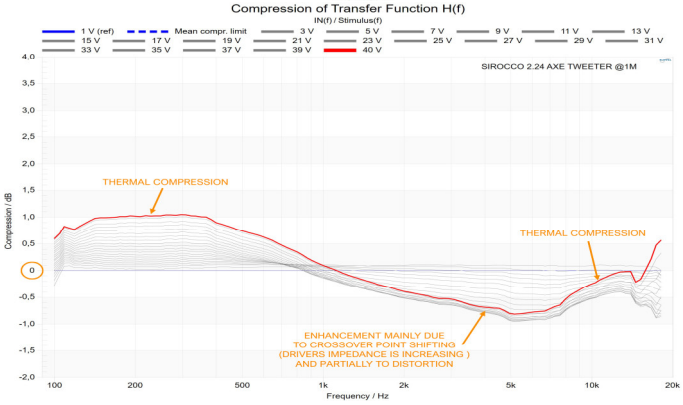










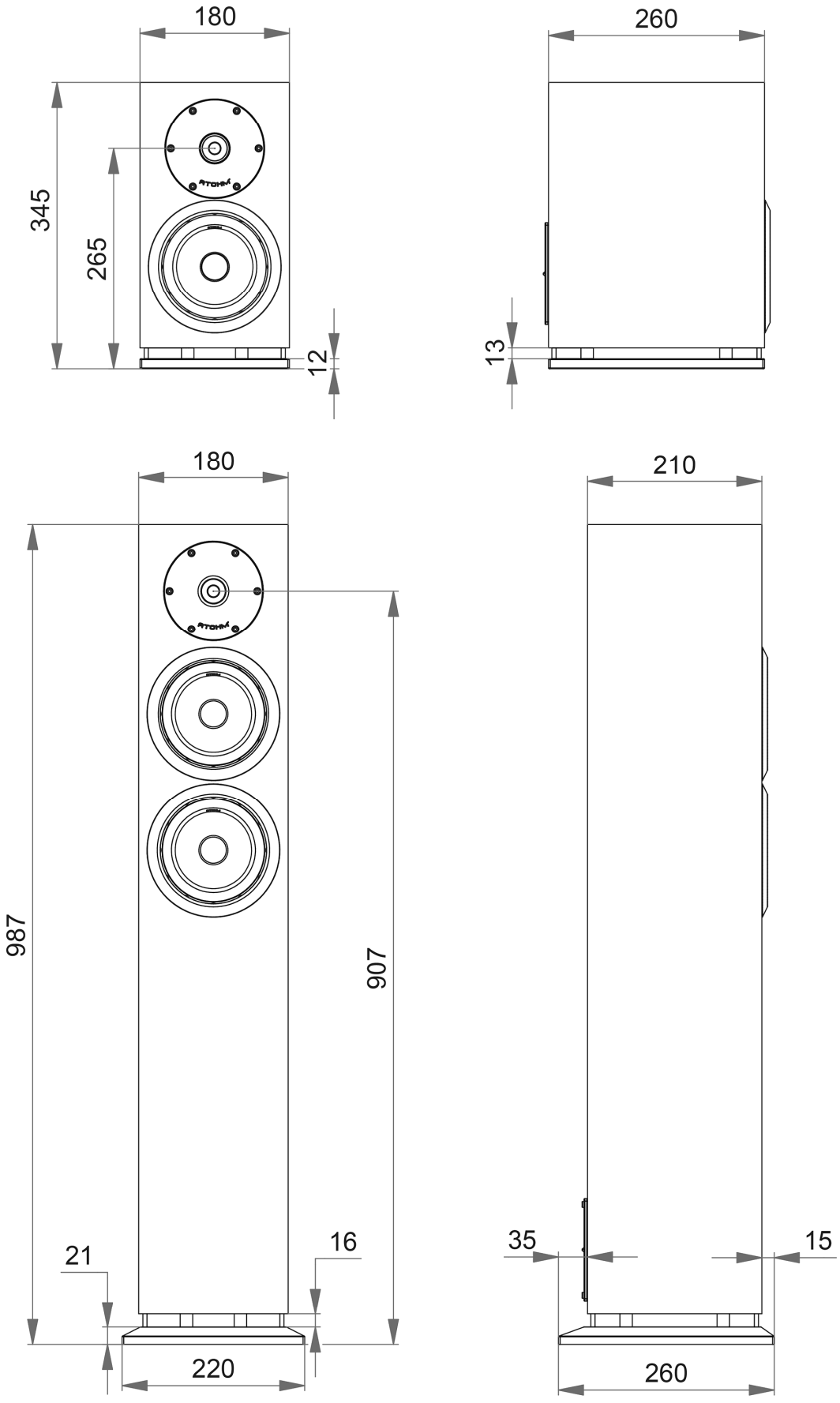


	SIROCCO 1.24	SIROCCO 2.24
Type	2 ways vented Bookshelf loudspeaker	2.5 ways vented Floorstanding loudspeaker
Frequency response	47Hz – 25 kHz (-3db)	40Hz – 25 kHz (-3db)
Sensitivity (2.83V /1M)	88 dB/SPL	88 dB/SPL
THD Distorsion (2.83V/1M) F>100 Hz	Inf. to 0.4%	Inf. to 0.4%
Nominal power handling according to IEC 60268 (100H)	100 Wrms (50-20 kHz) (Thermal compression <2.2dB)	130Wrms (40-20kHz) (Thermal compression <2.2dB)
Nominal short term (1s) power handling according to IEC 60268 – (80-20Khz)	270Wrms (40Vrms)	320Wrms (40Vrms)
Maximum usable short term (1S) SPL according to IEC 60268 – (80-20Khz – 40Veff with 12dB crest factor)	110 dB/SPL @ 1M (Thermal compression <1.8dB)	111 dB/SPL @ 1M (Thermal compression< 1.1dB)
Nominal impedance Minimal impedance (on imp. curve)	6 Ohms 4.4 Ohms	6 Ohms 3.5 Ohms
Mid bass unit	ATOHM C150 DCR 04	ATOHM C150 DCR 08 (x2)
Tweeter unit	ATOHM WSD20 DND 04F	ATOHM WSD20 DND 04F
Crossover slopes (electrical)	6dB /Oct with impedance compensation	6dB /Oct with impedance compensation
Crossover frequency point (acoustical)	3.5 kHz	3.5 kHz – 200Hz
Typical recommended amplifier power (conveyed under 4 ohms)	From 50 to 300Wrms*	From 50 to 300Wrms*
Recommended cables	ATOHM ZEF MINI / ZEF SPEAKER	ATOHM ZEF MINI / ZEF SPEAKER
Enclosure	MDF 18mm	MDF 18mm
Dimensions (L – H - P)	180*345*260 (mm) 7.09*13.6*10.25 (inch)	220*990*260 (mm) 8.66*39*10.25 (inch) (incl. stand)
Weight	7 kg / 15.5 pounds	14.9 Kg / 30.9 pounds

(*) The power supply, even when giant, and the so called "current capacity" (I) of an amplifier have absolutely nothing to do with voltage saturation (U). If the voltage (U) is too low, and thus the power (W) is too weak, an amplifier used beyond its capabilities with massive clipping leads to a significant degradation of audio performance. Over time, this can also damage the speakers. Therefore, it is always preferable to use a powerful amplifier with discernment rather than a modest one, ensuring not to play very loud on musical passages with dense bass and extreme bass. Aside from subjective listening preferences, the choice of equipment will necessarily be influenced by the room size, the distance between the speakers and the listener, and the desired sound level.

(*) Tube amplifier enthusiasts should favor push-pull designs using EL34, EL84, KT88 (etc.) with sufficient power. Depending on the damping factor, it may be desirable to add a compensation network (in parallel) to smooth the impedance curve and maintain good frequency response linearity. Typical values for the network are: 22uF MPT100V in series with 8.2 ohms minimum/10W

Outline drawings (mm)



Our concern for performance is leading us to constantly improve our products. The present features are subject to modification without any notice.

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