ARENDAL®

1723

SUBWOOFER

HANDBOOK

WELCOME

Thank you for purchasing an Arendal Sound product. We hope you enjoy it as much as we enjoyed creating it”

- Team Arendal Sound


PREPARED FOR MAYHEM

STORY OF ARENDAL

I was born and raised in Arendal 1978, Norway. As a kid I enjoyed many activities, such as catching fish for my cat Johnas, riding my bike, playing football and video games, and hanging out with friends. Of course not a day went by without wrestling with my older brother Dan Benny.

My dad, Jan, founded an electronic store in the 70´s and it quickly became the top selling store of it's kind throughout Norway. On a good Saturday it was not unusual to sell 40-50 color TV's, which were hot tech at the time. Today he spends his elder days as a fisherman, just like my grandfather Olav before him.

During my younger days there was rarely a weekend when I was not (somewhat reluctantly!) dragged out of bed on a Saturday morning to help sell my grandfather's catch from the night before to the neighbourhood. I was often told "your grandfather has caught a lot of fish, you need to help him sell it". Dragging all the fish with me, I walked several kilometers and knocked on many doors utilizing some maybe desperate sales tactics to charm the older ladies. My customers may have felt sorry for me seeing me walk around with fish, but I was able to sell them and returned home with pockets full of money. My grandfather gave me a cut of the sales so I could buy candy and save the rest in order to purchase more audio products. These were some of the best memories of my childhood.

As you may have guessed, I was introduced to the audio world at a very early age. When I turned 14 I started to work part time at my dad's store. When your hobby is electronics and you work in such an environment you get the urge to purchase and test as many products as you can, which I did with great joy. Normally, instead of a paycheck, I brought home new speakers or amplifiers that had to be tested. My very first setup was a stereo system with some huge speakers which could play very loud. It was hugely annoying to my mother. Does that sound familiar?

It's one thing to have fun with audio equipment, but another very different thing to understand it. I studied electronics for 8 years, graduated from Grimstad with an engineering degree and was lucky enough to get a job in the oil industry. After working in the oil industry for a while, I knew that it wasn't the field for me. Audio was my passion and that's what I wanted to work with.

With 15 years of business experience in the audio industry and after shipping tens of thousands of audio products throughout Europe and beyond, I wanted something else. Something of our own which had been lingering in the air for many years. At our 10th anniversary, what better way to celebrate and continue the story, than with the release of our own speaker brand?

The idea of Arendal Sound was born.

It was no coincidence. We've spent years researching, listening to our customers, planning, developing, engineering and investing in Arendal Sound. I always wanted our team to have something to be extraordinarily proud of and enthusiastic about. It had to be something that was based on solid acoustic engineering principles

and yet aesthetically beautiful, surrounded by a unique story - ours. Arendal Sound builds upon traditional and historic Norwegian elements, where solid craftsmanship and finish quality are a top priority, backed with pleasure in the use and pride in the ownership. We even want to show our beautiful country to our overseas customers and invite them to Norway.

We are a family and team with the same mentality and goal, to create market leading products, packed with incredible value, backed with our highly acclaimed customer support that extends beyond the date of purchase.

To me, business comes second and at the end of the day, it's my family who are most important. Without them it would have been hard. I would especially like to thank my wife, Heidi, as she has been by my side all this time showing extreme patience and understanding. And of course my two little kids, Marcus and Leander, they are the dessert in life as my mom and dad say.

We hope you will enjoy our products as much as we enjoyed making them.

Jan Ove Lassesen
Founder of Arendal Sound

1723

SUBWOOFER 1

BLACK GLOSS

WHITE GLOSS

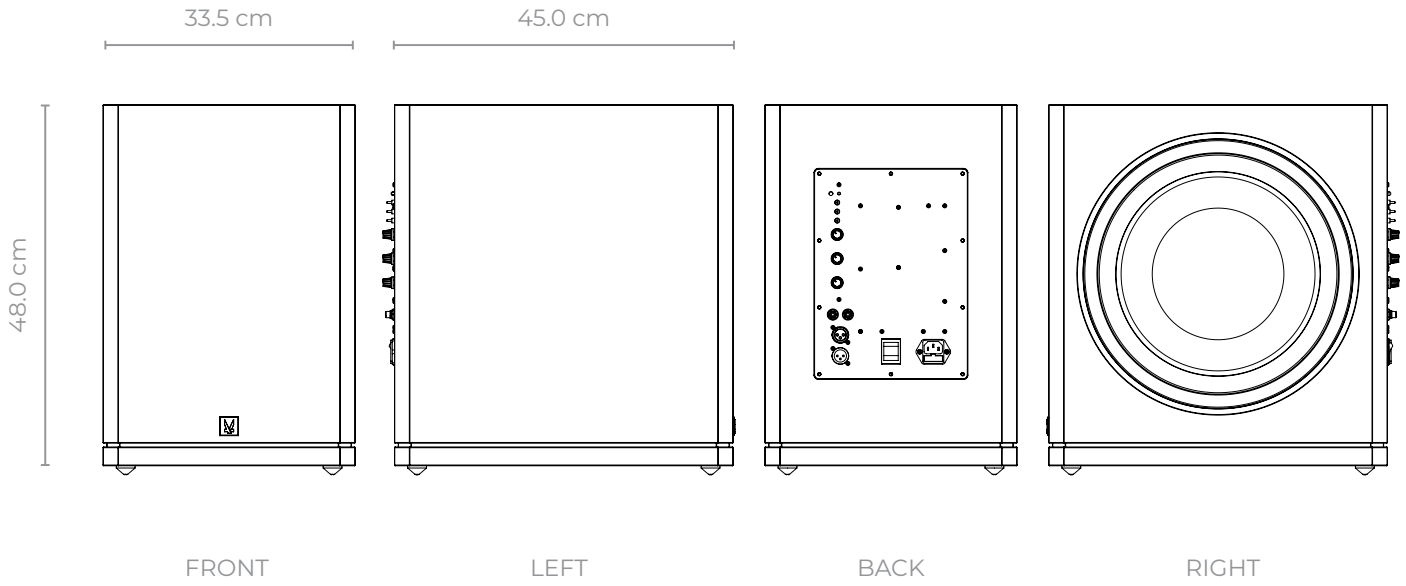
BLACK MATTE

WHITE MATTE

SPECIFICATIONS

The baby of our Subwoofers, the Subwoofer 1 is still a potent beast that would top many ranges. Using our proprietary 13.8” driver driven by our 500W RMS Avalanche DSP amp, the cabinet volume has been sized to produce an optimally damped system, producing low distortion, naturally deep bass. All of the features and technology that are present in our larger multi-driver subs are present, with no corners cut. Conceived as a natural match for smaller rooms, you will be amazed how large a room the Subwoofer 1 will be happy driving.

Woofer	13.8"
Enclosure	Sealed
Enclosure material	High Density Fiberboard (HDF)
Amplifier	Avalanche 500DSP, 500W RMS
Power cable	2.5 meters
Frequency response	
EQ1	20-160Hz (+/-3dB)
EQ2	34-160Hz (+/-3dB)
Dimensions without feet	48.0H x 33.5W x 45.0D cm
Dimensions with rubber cones	49.2H x 33.5W x 45.0D cm
Weight	24.5 kg
Break-in for optimal performance	50 hours



1723

SUBWOOFER 1.5

BLACK GLOSS

WHITE GLOSS

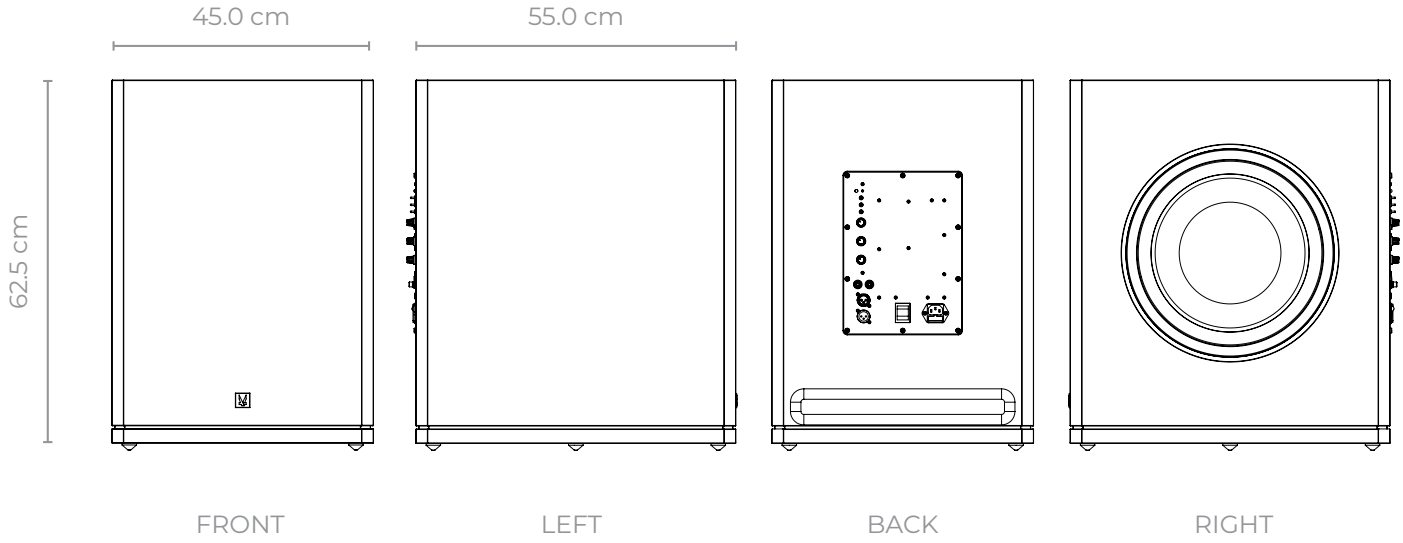
BLACK MATTE

WHITE MATTE

SPECIFICATIONS

The brand new Subwoofer 1.5 shares all of the same high quality components, design and build-up as our award winning subwoofers in the 1723 Series. Subwoofer 1.5 is simply a Subwoofer 1 on steroids. Same driver, same amplifier with unique DSP tuning. HDF enclosure, but with a high precision slot port. It's just scaled differently to offer another solution for our customers. Subwoofer 1.5 is equipped with a 13.8" driver and the Avalanche 500W amp with its massive power supply. The enclosure is big and ported, which can also be sealed for those who wants the edge in extra dynamics over sheer depth. Subwoofer 1.5 can deliver massive performance on movies, with real attention to detail and nuance in music. Movies or music, perfect for both.

Woofer	13.8"
Enclosure	Sealed / Vented
Enclosure material	High Density Fiberboard (HDF)
Amplifier	Avalanche 500DSP, 500W RMS
Power cable	2.5 meters
Frequency response	
EQ1 sealed	20-160Hz (+/-3dB)
EQ1 vented	18-160Hz (+/-3dB)
EQ2 sealed	24-160Hz (+/-3dB)
EQ2 vented	22-160Hz (+/-3dB)
Dimensions without feet	62.5H x 45.0W x 55.0D cm
Dimensions with rubber cones	63.7H x 45.0W x 55.0D cm
Weight	48.1 kg
Break-in for optimal performance	50 hours



1723

SUBWOOFER 2

BLACK GLOSS

WHITE GLOSS

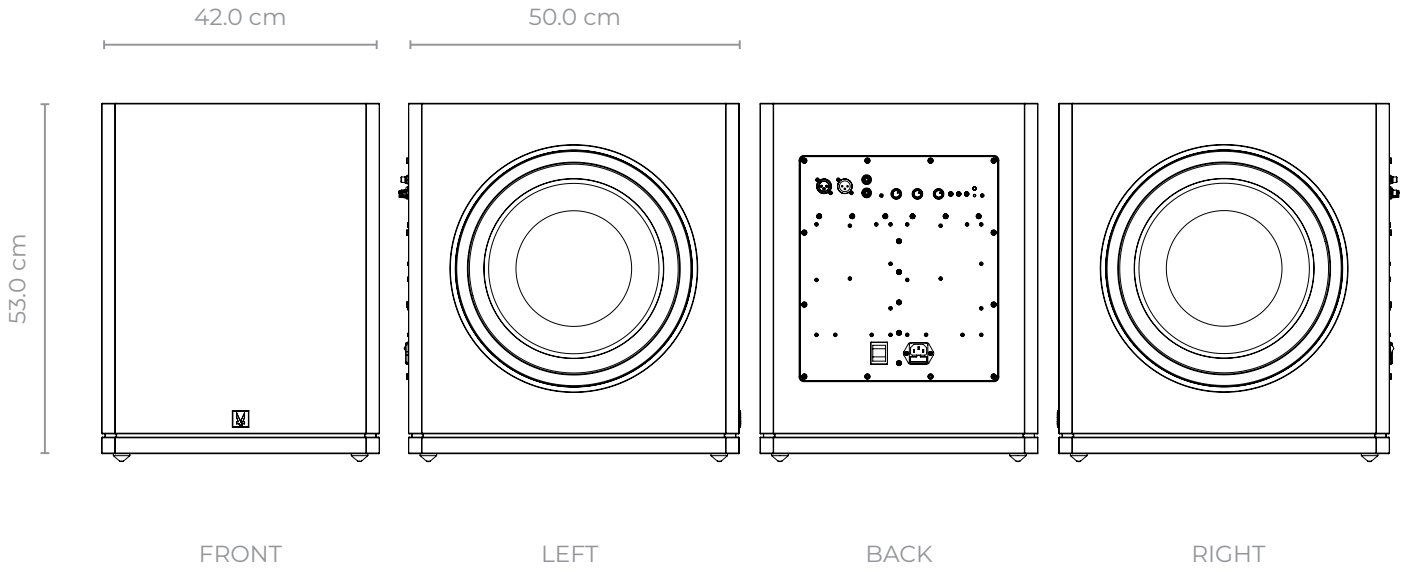
BLACK MATTE

WHITE MATTE

SPECIFICATIONS

The Subwoofer 2 is the pinnacle of bass accuracy. Using two of our proprietary 13.8” driver driven by our 1000W RMS Avalanche DSP amp, the cabinet volume has been sized to produce an optimally damped system, producing low distortion, naturally deep bass, that drops and drops. A further performance edge is provided by our dual opposed, force cancelling driver topology to deliver clean deep hits, without cabinet movement subtracting anything from the driver output. To be safe, we’ve over engineered the cabinet with inch thick walls and two inch thick baffles, so you won’t feel a thing even when crashing out the most bombastic soundtracks.

Woofer	2 x 13.8"
Enclosure	Sealed
Enclosure material	High Density Fiberboard (HDF)
Amplifier	Avalanche 1000DSP, 1000W RMS
Power cable	2.5 meters
Frequency response	
EQ1	20-160Hz (+/-3dB)
EQ2	32-160Hz (+/-3dB)
Dimensions without feet	53.0H x 42.0W x 50.0D cm
Dimensions with rubber cones	54.2H x 42.0W x 50.0D cm
Weight	41.4 kg
Break-in for optimal performance	50 hours



1723

SUBWOOFER 3

BLACK GLOSS

WHITE GLOSS

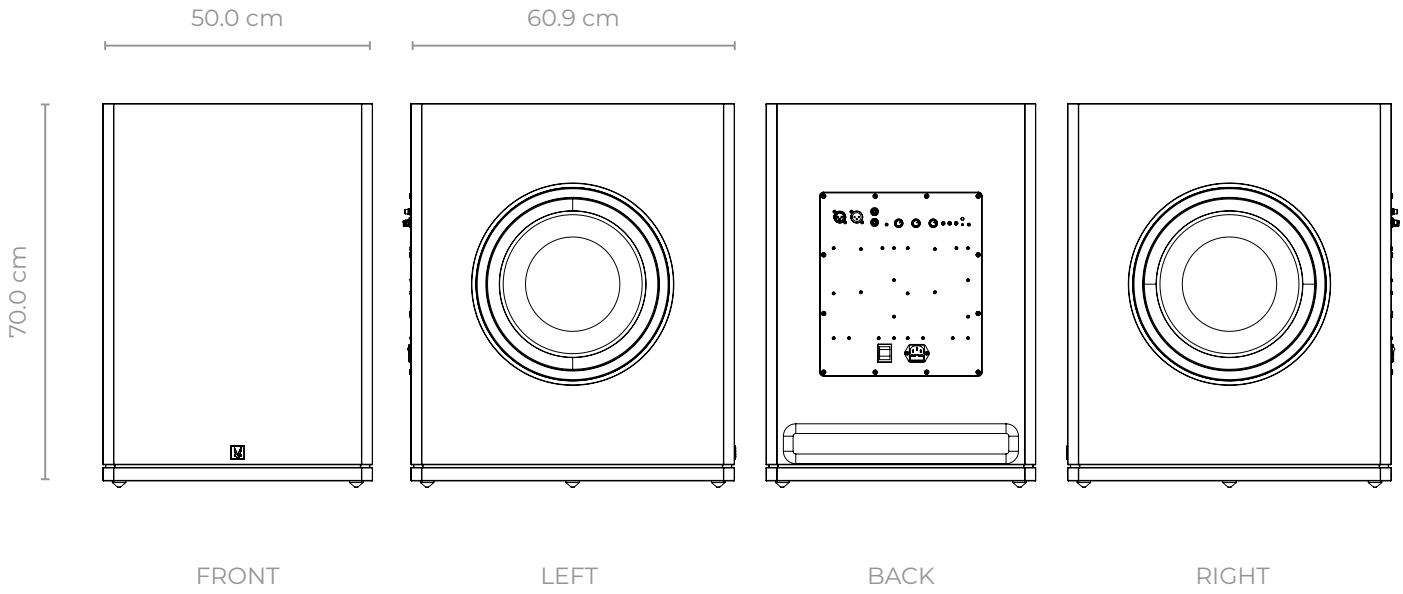
BLACK MATTE

WHITE MATTE

SPECIFICATIONS

The Subwoofer 3 is our statement of the fine balance between pure bass accuracy and sheer bass depth and output. Using two of our proprietary 13.8” driver driven by our 1000W RMS Avalanche DSP amps, the cabinet volume has been increased over the Subwoofer 2 to increase efficiency and allow us to add super-quiet, slot port loading to increase bottom end output. Plug the port for greater accuracy, or unplug for greater output. Utilizing our dual opposed, force cancelling driver topology to deliver clean deep hits, without cabinet movement subtracting anything from the driver output, we have created a state of the art subwoofer to drive even the largest rooms with massive, deep, low distortion bass.

Woofer	2 x 13.8"
Enclosure	Sealed / vented
Enclosure material	High Density Fiberboard (HDF)
Amplifier	Avalanche 1000DSP, 1000W RMS
Power cable	2.5 meters
Frequency response	
EQ1 sealed	20-160Hz (+/-3dB)
EQ1 vented	17-160Hz (+/-3dB)
EQ2 sealed	28-160Hz (+/-3dB)
EQ2 vented	25-160Hz (+/-3dB)
Port	4H x 40W cm
Dimensions without feet	70.0H x 50.0W x 60.9D cm
Dimensions with rubber cones	71.2H x 50.0W x 60.9D cm
Weight	60.1 kg
Break-in for optimal performance	50 hours



PREMIUM BUILD QUALITY

Rock solid HDF cabinets

Higher density and naturally better damped than MDF (Medium Density Fiberboard), using HDF (High Density Fiberboard) results in a sonically inert cabinet which improves dynamics. HDF was also chosen because it can be machined much more precisely than MDF, which is especially important for precision critical areas like the two part HDF & Aluminum waveguide on the 1723 Series.

All Arendal Sound products are using HDF thicknesses ranging from 18 to 50mm throughout the designs, with critical areas like driver mounting and cabinet bases being the thickest.

Internal bracing has been strategically placed for 1723 products to increase overall cabinet strength and limit unwanted panel vibrations that may cause audible colorations. Internal braces are CNC routed to shape to smooth internal airflow and minimize volume losses within the cabinet, whilst maintaining thickness at critical assembly joints.

Butyl - Worst enemy of resonances

This is really unique and rarely seen in commercial products, if any. The final detail for 1723 Tower, Monitor and Center, is to apply a butyl based differential mass damping layer to the inner faces of the cabinet, just to be sure we have damped out every last resonance in the large enclosures.

Exclusive customized grills

We are especially proud of our exclusive and fully custom made grills.

For all 1723 series speakers, we have made a free flowing, curved, perforated metal grill which does not affect sound quality. We have then wrapped it with a clean black cloth to tone down the visually hard look, whilst simultaneously damping out any residual vibrations. In addition, we use neodymium sub-surface magnets grip the metal grill with great force, preventing unwanted movement and vibration during high level playback. The grills have a rubber protection to ensure the cabinet is not damaged when you attach the grill and you will hear a nice ‘thump’ when you let them seat.

For 1961 series, we crafted customized perforated grills in high quality ABS, wrapped in the same clean black cloth as for 1723, for perfect blend mixing 1723 and 1961 speakers. To keep the same clean majestic look as our 1723 subwoofers, we are using a customized trim ring to smooth the transition from cabinet to driver without showing screw holes. To make this happen, we had to use neodymium sub-surface magnets here too on 1961 subwoofers.

Grills on or off, our speakers look and sound great either way.

Premium finishes - No vinyl

All Arendal Sound speakers comes in premium finishes and we offer high quality multi-layer paint only. 1723 products gets the smooth satin feeling or premium gloss finishes, and 1961 has the matte texture paint structure to it.

1961 options

- Black Matte
- White Matte

1723 options

- Black Satin
- Black Gloss
- White Satin
- White Gloss

To ensure the best and long lasting quality, all Arendal Sound speakers use up to 12 layers of paint, consisting of primers and polyurethane paint, hand finished. We use no vinyl, anywhere. The finish is what you would expect from Hi-End products.

No plastic - "Green sound"

Well, you may find a cable strap somewhere in plastic, but all components in 1723 series products which affect the sound are built up from non-plastic parts, like our high grade aluminium back plates on subwoofers and speakers. Even our logo is in anodized aluminium.

Internal wiring

Not your average zip cord. All 1723 products utilize high count multi-strand wire, braided together. These were not done for looks, but chosen to produce the most consistent impedance possible and electrical current carrying capabilities. The benefit is very low insertion losses without the problems of "skin effect" caused by large diameter wires. This ensures that each driver sees what the amplifier intended without additional colorations.

Rubber feet

All 1723 subwoofers come with rigid rubber feet (M6 threads) which have a strong grip on the floor. You will not have a subwoofer walking around, even if that is impossible due to the sheer mass of our HDF cabinets which are "super quiet". Put your hand on our speakers whilst they are playing and you will feel very, very little.

For 1961 Tower and subwoofers, we have customized a new slick puck-design for solid and extreme stability against the floor. Branded with the Arendal Sound logo.

AVALANCHE AMPLIFIER

The brain of Arendal Sound subwoofers, the Avalanche 500DSP and Avalanche 1000DSP, are built around a Texas Instrument's 48-bit data path (with 28-bit fi lter coeffi cients) DSP engine, allowing virtually unlimited design fl exibility with the assurance of no signal degradation along the way. Each amplifi er's transfer function, power output limiting and thermal protection are monitored to the millisecond and are customized for each individual drive unit and cabinet combination. The high effi ciency Class D amplifi er modules are based on a proven topology that has been continuously refi ned over the past 4 years. Excelling in transient response, high current output and very low distortion, they deliver the necessities for highly accurate, deep bass with output capabilities that drives and controls each 13.8" woofer to its fullest potential. Perfectly matched, by design.

Avalanche Pre-amp features:

- LED mode indicator (power on, standby, mute/ protect)
- Auto on/off (defeatable) on both RCA and XLR inputs
- 2 position user EQ modes for your taste:
  - EQ1
    - Frequency response is extended to the lowest octave offering more energy below 40Hz. This effect matches well to effects found in movies and often times is found work well for music tracks as well when more bass emphasis is desired.
    - EQ1 is recommended for larger rooms or if you lust for the extreme bass levels in smaller/larger rooms
  - EQ2
    - Frequency rolls off gradually below 40Hz, counteracting the effects of "room gain" which raises in smaller rooms. The combined result can be a more accurate, balanced bass level across all octaves. - EQ2 is recommended for smaller rooms, especially for music

- Volume control with preset for home theater subwoofer gain calibration (reference level)
- Continuously variable phase control from 0-180 degree
- 24db/Octave Linkwitz-Riley Low Pass Filter, variable from 40Hz-160Hz with bypass option for use with preprocessor's internal bass management
- Subsonic protection fi lter in Subwoofer 3
- Fully balanced differential XLR input & XLR passthrough output
- Soft start volume rise at power on
- Amp modules communicate with preamp protection circuit for status monitoring, shutdown & soft start functions
- Limiter continuously monitors bass energy content and within milliseconds will control the waveform to prevent any potential overdrive or unwanted distortions
- The measured latency is 3ms - Only adds 3ft/90cm in your pre-processor/AVR channel delays

Avalanche Pre-amp features

- Integrated high current switch-mode power supply with >90% effi ciency.
- Standby low power mode with <1W power consumption.
- Self-oscillating PWM generation; less complex and more stable than many other Class D topologies with the benefit of reduced EMI.
- High current output stage.
- High damping factor.
- Excellent transient response and low distortion across the entire power range.
- Features 2x500W monoblock modules for the Avalanche 1000DSP amps, that are invert-crosscoupled to form a full bridge to more effi ciently use the AC power and lowering distortion.
- Features 1x500W for the Avalanche 500DSP amp.
- Protection against over-current (and shorted outputs), over temp, over voltage and DC fault.
- ETL, ROHS and CE certifi ed.

13,8” WOOFER

Why 13.8”? The 25% larger surface area, when compared to a 12” driver, yields a woofer that requires less excursion and power to achieve the same SPL levels. The result is lower distortion, higher power handling and most importantly - tighter bass. Every part for this driver has been custom tooled to deliver high output, low distortion, accurate bass.

Design features

Ultra-high temp polyimide former with CCAW voice coil (copper clad aluminum wire) for low mass, high motor force and optimal thermal dissipation.

Benefits:

- 85% Aluminum / 15% Copper allows larger wire for more surface area.
- 68% as conductive as copper, but only 40% the mass for lighter weight.
- Ultra-high temp Polyimide prevents insulation breakdown at high power levels (aka “burnt voice coil”)

After thorough optimization and testing (using FEA, Klippel and other methods) we refined a motor featuring multiple aluminum shorting rings with focused field “T” pole design. The result is a linear magnetic field over a long voice coil throw, with very low inductance.

The symmetrical suspension consists of a heavily analysed NBR surround and Connex spider with integrated tinsel leads. All combined to create a very high excursion with linear suspension. Again, contributing to high output and low distorting accurate bass.

Hybrid cone

Our unique hybrid cone of long fiber pulp and fiberglass, takes advantage of the pulp’s superior stiffness to weight ratio, with the additional rigidity of fiberglass to deliver a driver of massive durability that inherently inert and self damping. The result is a cone that achieves optimal pistonic motion at all frequencies it is asked to produce and beyond.

Air flow venting

Air flow venting underneath the dust cap (vents in cone body) and spider (vents in frame) are added for two very important reasons. Air heated by the voice coil is forced away with each stroke of the cone diaphragm. This continuous exchange of air mitigates thermal compression and increases the woofer’s overall power handling capability. Second, the airflow relieves asymmetric compliance and noises (ie, distortion) due to non-linear compression and rarefaction of air typically trapped under the dust cap and spider. Typical, vented pole designs will be limited in effectiveness due to the lack of airflow volume - At the highest power and excursions, where free, smooth airflow is needed most, the pole vent alone is not sufficient.

Driver shielding

Shielding is added to all drivers to avoid any problems with air shipping as UPS (and other carriers) have an upper Gauss (magnetic field) limit. As Arendal Sound speakers and subwoofers are shipped world wide, we did not want them to be held at the airport terminals. We absolutely would not fit them with smaller motors than they deserve. We compromised nothing.

PLACEMENT & SETUP

Subwoofer placement can make or break system performance. As the foundation of rhythm, timing and impact upon which music or movie soundtracks are built, a poorly positioned subwoofer will deliver uneven, tuneless, slow and soggy bass. The whole system will not sound good. End of.

The performance of a subwoofer is inextricably linked to the room in which it sits It is therefore impossible to optimize the subwoofer without considering the room and it's contribution. This contribution takes two forms. The first is the structure of the waves reflected within the room and how they super-impose on top of each other to deliver excessive peaks at certain frequencies, whilst causing total cancellations at others. The second is the room's ability to absorb bass (or as you will hear it, let bass leak out) through flexible structures like stud walls.

Even though what follows may seem contrary to what many will say (or rather parrot what they have heard) there are good, solid acoustic reasons for what follows. Here is why...

Corner placement

Arendal Sound therefore recommend starting with a front corner placement. Try to use the corner with the most solid structure - usually brick or block, or if in a timber framed construction; the one with the larger, thicker timbers which are usually an outside wall. Don't get too hung up on this, as your room is what it is.

But why a corner? For starters, a corner delivers the most possible boundary gain, increasing for free, the apparent bass output. You may not want all of this output, but you can always turn the subwoofer down and as a result, you will enjoy increased dynamic headroom and lower distortion. That bit is standard subwoofer lore, but that's not the whole story, because corner placement delivers two other benefits.

The first of these is that you have greatly simplified the structure of room modes (the peaks and dips the overlapping bass waves produce) and therefore the ease with which you can tune the bass to flat with EQ, for more listening positions. This may sound counter-intuitive, as corner placement is known for emphasising the axial modes - the main ones that are associated with the rooms largest dimensions. What corner placement does is greatly reduce the number of reflections within the room, because in subwoofer terms, the wall against which the subwoofer sits, is effectively removed from the equation of the first reflections.

How so? If you place a subwoofer at some point out in the room, all of the walls have a first reflection that will bounce around the room to create modes. If you place a subwoofer against a wall, the first reflection of that wall is, to all intents and purposes, removed as the few inches of clearance between the subwoofer and wall, mean they are effectively the same place. Remember, we're dealing with wavelengths of metres in length, so even 30cm is comparatively irrelevant. So, as that wall is effectively at the subwoofer, it's reflection has been removed. Put the subwoofer in the corner and you have effectively removed two walls.

You will still get the first reflection from the opposing walls, but that's half the number of first reflections and the resulting peak/dip structure in the room might be slightly increased, but it will be simpler and more likely to be similar across a wider number of seating position. This presents a far simpler proposition for the Auto EQ in your AV-Receiver or Processor.

But there is more

Each first reflection, sits on an indirect path to your ears, that is longer than the direct path from the subwoofer. So, it seems obvious that each reflection having travelled further, is time delayed. That a succession of delayed signals arriving at your ear will time smear the original signal into a longer, drawn out version. This is clearly not accurate and is just another form of distortion of the original signal, robbing the signal of dynamic impact and obscuring bass texture.

This is important because, whilst we tend to visualize sound in a two dimensional world of frequency versus amplitude and love a graph showing a flat response, our brain very much processes sound using information from the third dimension of time. Indeed, our brain has a very difficult time differentiating a loud sound, from a quieter one that lasts longer.

Of course, in an ideal world, we would have a flat response and a smooth fast decay of sound, but the decay time dominates our aural perception, so these algorithms will turn a given frequency down below the flat response, in order to trick our brains into hearing it as flat. Against this background, it's easy to see why putting a subwoofer into a corner, removes reflections, simplifying the response in both the frequency and time domains in a way that modern equalisation likes to see and deal with and our ear will hear as tighter and better defined.

But I want more subwoofers!

As a manufacturer of fine subwoofers, Arendal Sound will not argue with you! In our defence, the benefits of multiple subwoofers are well known, for extending headroom, lowering distortion and increasing the depth of audible response. There is no argument there. So where do you put this second subwoofer?

The optimal position for a second subwoofer, is co-located on top of the first one. This is true, even if you can't put the first one in a corner. The second best position is co-located next to the first one. There is a school of thought that mirror image position of the first one is best, especially now some AV-Receivers and processors have independently equalisable subwoofer channels and the new, object based surround formats, can carry two channels of sub-bass equalisation. However, we would suggest that one (or effectively one in the case of two co-located) better subwoofer will give superior bass.

In much the same way our Subwoofer 2 and 3 take advantage of using the mutual acoustic coupling of two drivers to deliver significant performance gains in place of one, larger driver, without the drawbacks, two co-located subwoofers confers the same advantages - Namely, you get the full monty of a 6dB gain in output, or 6dB

reduction in distortion for a given volume setting. Spread the subwoofers further apart, and that advantage halves to closer to 3dB. 3dB is still a useful output, but separation makes a number of factors more difficult to deal with.

For one, rooms are rarely acoustically symmetrical. Even if all of the walls are the same size and structure, it's unlikely that every piece of furniture in the room is a mirror image and it all counts - Each subwoofer will have a different in-room response and require a different EQ solution. Also, whilst each subwoofer will be EQable, different listening positions will have a different path length to each subwoofer. You will just have made it harder for your AVR or Processor to achieve an EQ solution as now, not only is it fighting the room and it's dimensions, but also the changing dimension of listener to subwoofer distance to not just one subwoofer, but two.

It is arguable that in the case of stereo programme, stereo bass from two equally distributed subwoofers should be superior. However, the ear/brain makes virtually no use of the sub 80Hz subwoofer bass wavelengths to form a believable stereo image and very few recordings actually mix the bass into different channels - It is nearly always summed into an equal mono signal. In acoustic recordings where a double bass may have been recorded in real space (as an example) it's still the frequencies above the normal 80Hz crossover that carry all of the directional information. Thus, one source of better bass that serves all channels, is the better overall solution, for more listening positions.

But you mentioned stacking the two subs?

This comes back to the room and integrating the subwoofers within it. In all practical terms, the raw bass performance of the two subwoofers sitting next to each other across the corner will be the same as two stacked, so why risk slipping a disk trying to lift one up?

Basically, it's an extension of working with the room in the way the corner position does, with a couple of added benefits.

If there is one dimension that corner placement (or all other placements for that matter) does not deal with, it's that of the floor to ceiling - normally somewhere in the 2.4-2.7m region which correlates with the 60-70Hz region. Of course, being in the corner on the floor has removed the floor's contribution first reflection, just as it did with the two adjacent walls, but stacking goes further.

The subwoofer effectively act as a point source, with a spherical wavefront, restricted by the walls and floor. When you stack subwoofers, this spherical wavefront starts to behave more like a cylinder emanating from a line source. Stack them all the way to the ceiling to achieve a cylindrical wavefront, you then get a phenomenon where bass power only halves with a doubling of distance, rather than quarters. So, perversely, you can play the full stack quieter, for the same perceived bass at the listening position, meaning it's actually less intrusive in the rest of the house. The full stack also completely removed the floor and ceiling from the room mode equation, making it by far the easiest arrangement to EQ.

Even if we rewind to having just two stacked subwoofers, you've gone a long way in terms of improving all of the possible parameters that you can. You have gained the most you can in headroom and distortion terms. There are no differential path lengths to make EQ difficult. You are moving toward a cylindrical wavefront, simplifying EQ and reducing time domain distortions from first reflection from the ceiling, improving impact, texture and timing.

But That Looks Awful!

Nobody said this was an absolute, just the least compromised in acoustic terms. The reality of a harmonious domestic existence may decide otherwise, so side by side is a close second best, with any position that moves the subwoofers apart, progressively worse.

We will note that there are many other combinations of multiple subwoofer installations including one in each corner, or the center of each wall. However, we would suggest that whilst these ape the staggering results that can be achieved in a professional install with a high end processor (and very expensive measurement and off-board correction equipment) simply positioning the subs so and hoping an automated EQ will sort it out, is still a long way from being a practical reality.

Conclusion?

The conclusion is a mix of standard recommendations and our, electro-acoustic engineering focused approach to our subwoofers.

We could iin some cases recommend a single 1723 Subwoofer 2 over a couple of 1723 Subwoofer 1s, if you're gong to spread them apart. Or a couple of stacked Subwoofer 1s over a Subwoofer 2 in terms of in room response. However, the bigger more efficient 1723 Subwoofer 3 at a touch more money than a pair of Subwoofer 1s and although large, isn't as visually intrusive as a pair of stacked Sub 1s. The ultimate bass experience is enough stacked Subwoofer 2s or 3s to reach your ceiling! There are many combinations to bass nirvana.

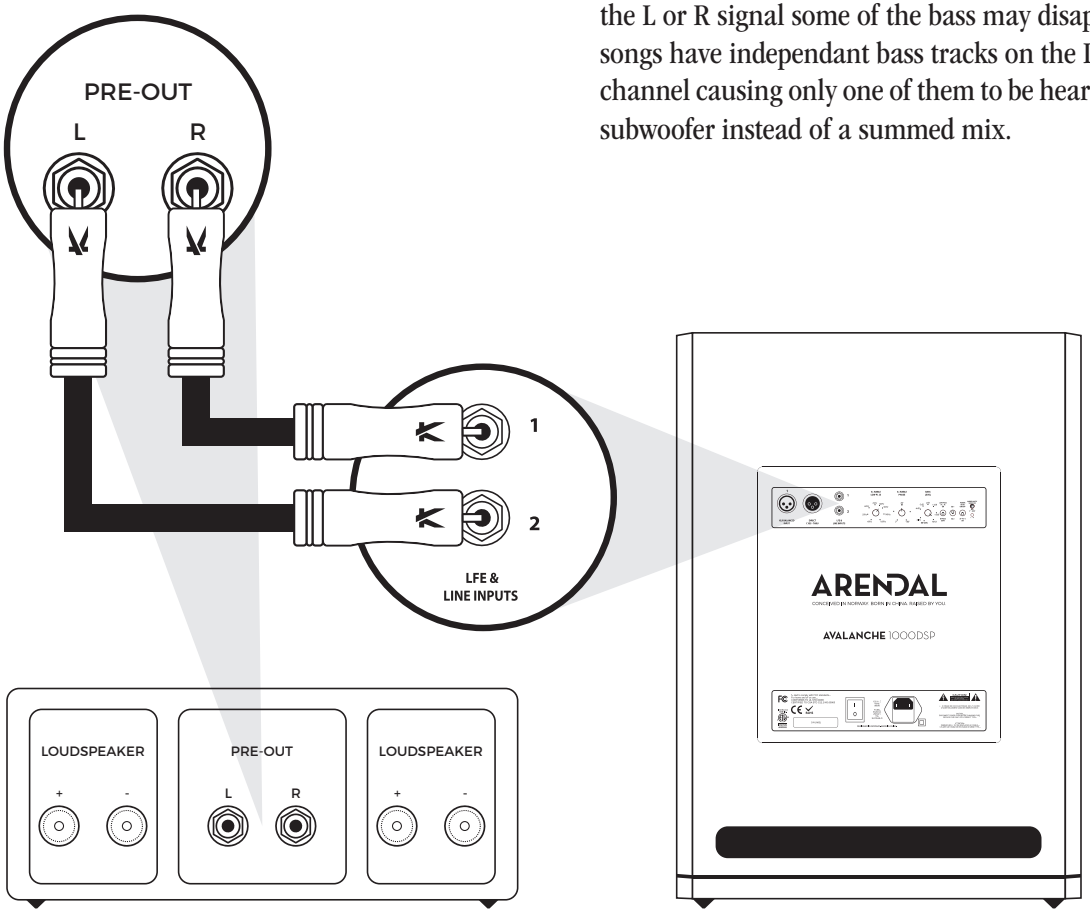
That's just a few of the combinations we can think of and of course, we can't see the possibilities or restrictions of every room out there. No two rooms are the same and that's why, ultimately there is no one-size-fits-all approach to subwoofers.

We encourage everyone to get in touch with us at ***support@arendalsound.com*** to get expert help on choosing the right Arendal Sound subwoofer(s) for you and placement options.

HOW TO CONNECT

How to connect the subwoofer

Connecting to a stereo setup
Depending on your subwoofer layout, we recommend two different methods of connecting the subwoofer(s) for a normal stereo playback system, where there is no dedicated subwoofer output from the source.

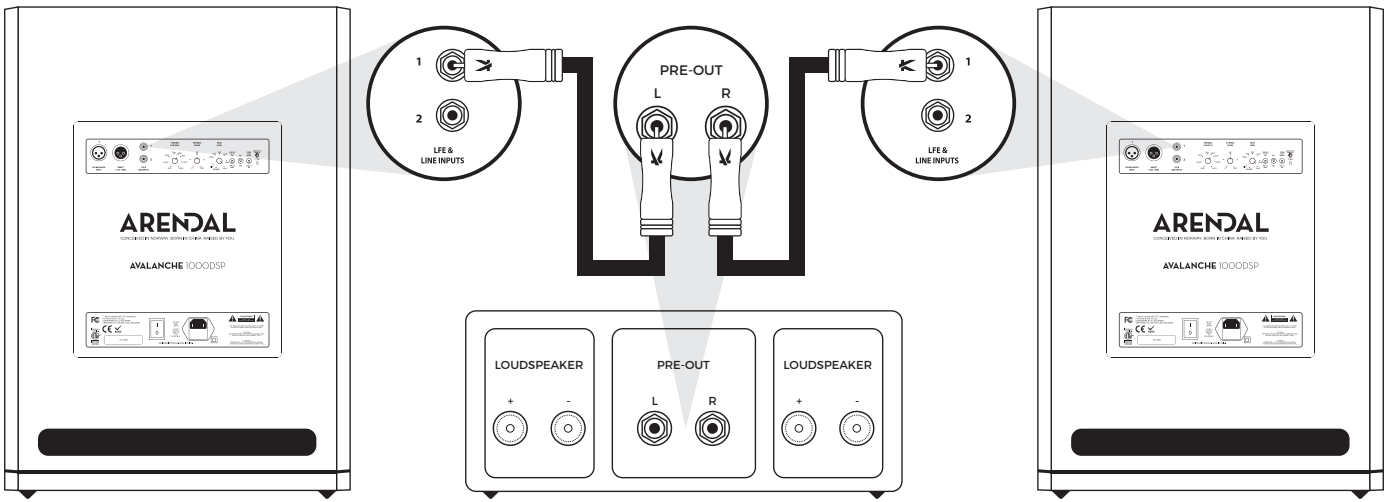


Single subwoofer connection
When hooking your subwoofer up to an existing stereo setup, where there is no dedicated subwoofer output from your source we recommend that you use both L and R variable outputs (output level controlled by the amplifier volume control) from the source into the subwoofers amplifier. This will ensure that the signal is correctly summed as a mono signal to the subwoofer. If only using the L or R signal some of the bass may disappear as some songs have independant bass tracks on the Left and Right channel causing only one of them to be heard through the subwoofer instead of a summed mix.

Dual subwoofer connection

When using two separate subwoofers in a music system we recommend using L and R outputs to each subwoofer (L goes to left subwoofer, R goes to right subwoofer) instead of summing a mono signal on each subwoofer if they are located on each side of the front speakers. This will ensure a true stereo image throughout the entire frequency spectrum. Note that this method is not recommended if using the two subwoofers in any other configuration than on each side of the room close to the main speakers. For any other configuration we recommend summing a mono signal to each subwoofer.

If both subwoofers are placed at the same position (side by side or stacked), we recommend summing the signal to mono to both subwoofers.

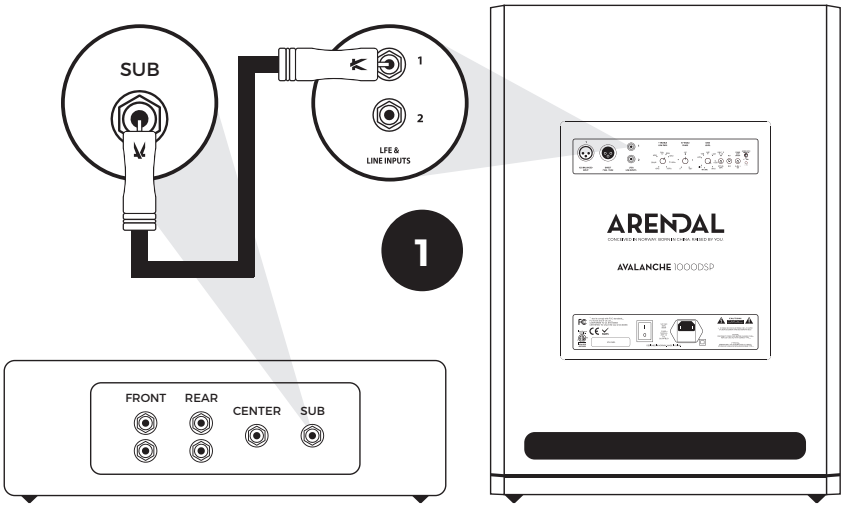


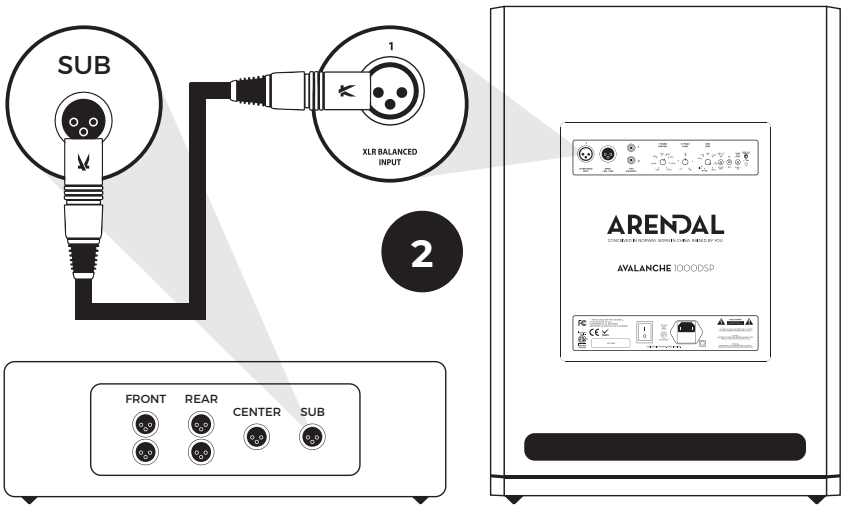
Connecting to an A/V-Receiver
For a typical AV Receiver/Processor connection, we recommend using a single RCA (fig. 1) or XLR (fig. 2) cable between the receiver's Subwoofer output (SW Out, LFE Out or similar, please refer to your product manual) and connect to the LFE input on the subwoofer amplifier.

Where an AVR/Processor has two or more subwoofer outputs, only use one to each subwoofer. There is no advantage in using two outputs into one subwoofer.

Subwoofer operation

Enclosure tuning (Subwoofer 1,5 and Subwoofer 3 only)
Subwoofer 1,5 and Subwoofer 3 offers the ability to be used with either vented or sealed alignments. By removing the foam plug from the port, low frequency output can be extended with different bass character. The subwoofer offers greater deep bass extension and more power as a vented design. As a sealed enclosure it offers even better transient response and a smoother roll-off that may suit music listeners and/or smaller rooms better.



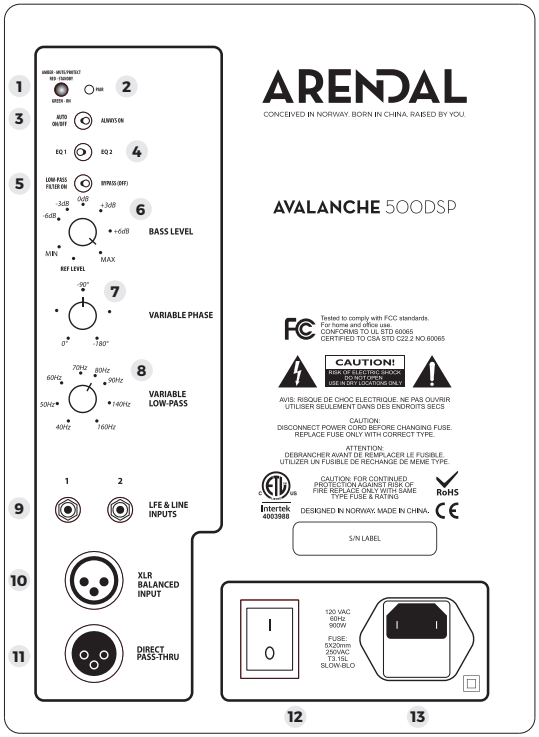


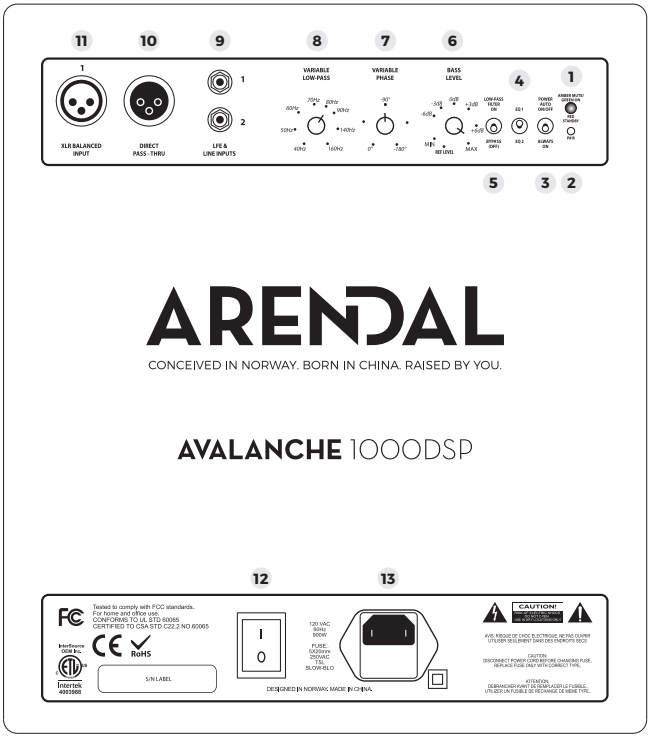

-3dB
-6dB
MIN
+6dB
REF LEVEL
MAX
BASS LEVEL
0°
-180°
VARIABLE PHASE
60Hz
50Hz
40Hz
140Hz
160Hz
VARIABLE
LOW-PASS
1
2
LFE & LINE
INPUTS
XLR
BALANCED
INPUT
DIRECT
PASS-THRU
ARENDAL
CONCEIVED IN NORWAY. BORN IN CHINA. RAISED BY YOU
AVALANCHE 500DSP
Tested to comply with FCC standards.
For home and office use.
CONFORMS TO UL STD 60065
CERTIFIED TO CSA STD C22.2 NO.60065
CAUTION!
RISK OF ELECTRIC SHOCK
DO NOT OPEN
USE IN DRY LOCATIONS ONLY
AVIS: RISQUE DE CHOC ELECTRIQUE. NE PAS OUVRIR
UTILISER SEULEMENT DANS DES ENDROITS SECS
CAUTION:
DISCONNECT POWER CORD BEFORE CHANGING FUSE.
REPLACE FUSE ONLY WITH CORRECT TYPE.
ATTENTION:
DEBRANCHER AVANT DE REMPLACER LE FUSIBLE.
UTILIZER UN FUSIBLE DE RECHANGE DE MEME TYPE.
CAUTION: FOR CONTINUED
PROTECTION AGAINST RISK OF
FIRE REPLACE ONLY WITH SAME
TYPE FUSE & RATING
Intertek
4003988
RoHS
DESIGNED IN NORWAY. MADE IN CHINA.
S/N LABEL
I
O
230 VAC
50Hz
550W
FUSE:
5x20mm
250VAC
T2L
SLOW-BLO

AMPLIFIER OPERATIONS

Quick panel overview

1. **LED mode indicator**
2. **Pairing -** Currently not utilized
3. **Auto ON/OFF switch -** Works for both RCA and XLR inputs
4. **2 position EQ switch -** Different tuning options
5. **Low Pass Filter -** Toggle on to use the subwoofer amplifiers crossover
6. **Bass Level -** Adjustable gain control
7. **Phase -** Adjustable from 0-180 degree
8. **Low pass filter -** Adjustable crossover from 40Hz-160Hz
9. **LFE & Line inputs -** Gold plated RCA inputs
10. **XLR Balanced Input -** Fully balanced differential XLR input.
11. **XLR Direct Pass-Thru -** Fully balanced differential XLR output
12. **Mains power switch -** On and off
13. **C18 Power inlet -** With fuse holder





Since these amplifiers are mini computers there are certain areas that the amp will function differently than familiar analog circuits.

1. **LED mode indicator** - Indicates what status the amplifier is in, whether it is in standby, power on, mute or protect. It will also blink during boot up and shutdown (unless shutdown from standby). Standby is indicated by a RED light. Power on is indicated with a GREEN light.
2. **Pairing** - For future WISA wireless module upgrade. Currently not utilized.
3. **Auto ON/OFF switch** - Works for both RCA and XLR inputs. The typical turn-on/off thresholds are as follows. The LED will be solid RED until it senses a signal, then will turn solid GREEN. NOTE that the gain, phase or crossover do not affect this turn on threshold appreciably. 2 x RCA is for 2 independent sources driving each RCA, not a simple y-connector:

	1xRCA	2xRCA	XLR
Turn on	5-10mv	2.5-5mv	10-20mv
Turn off	> 30 min	> 30 min	> 30min
Turn back on	5-10mv	2.5-5mv	10-20mv

Always on

After the amp boots up it will attempt to detect a signal at one of the inputs. LED flashes green. The signal threshold follows the chart above for required voltage to sense. Once turned on, the LED will be solid GREEN and the other input will be ignored.

Signal Selection

Whether the amp is in "auto" or "always on", the DSP will monitor the XLR and RCA inputs for the presence of a signal. Once detected the amp will lock on only one input (XLR or RCA's). If there is signal applied to both the XLR and RCA, the amp will select XLR. Since the Avalanche amps are digital, there are 2 main differences here compared to an traditional analog amplifier platform;

- Approx. 5-10 seconds to sense signal then turn on.
- You cannot hot swap input because the amp will not look at the other input. The amp will need to be powered down, then turned back on to change inputs.

4. **2 position EQ switch** - EQ1 gives a flat anechoic response, which will give great emphasis on the lower octaves. For movies this can be especially appealing. For smaller rooms and/or music listening, the EQ2 setting can be beneficial. The bass will roll off with 12db/octave from around 40Hz which will give a smooth bass response in smaller rooms for the lower octaves.
5. **Low Pass Filter** - Toggle on to use the subwoofer amplifiers adjustable crossover. By-pass option for use with AV-Receiver/Processor's internal bass management which is recommended when possible.
6. **Bass Level** - Control with preset for home theater subwoofer gain calibration (reference level). The Reference level is 2-3db above THX specifications which fits perfect with our Tower speaker in terms of sensitivity.

7. **Phase** - Adjustable from 0-180 degree. We recommend leaving the phase at 0 degrees when using a AV-Receiver/Processor with time (channel distance) alignment feature. For music setups the phase need to be adjusted so the subwoofer blends with the front speakers.
8. **Low pass filter** - 24db/oct Linkwitz-Riley low pass filter. Adjustable from 40Hz-160Hz.
9. **LFE & Line inputs** - Gold plated RCA inputs. Use either one input for a single subwoofer signal (LFE / Subwoofer out or similar from the pre-processor). For stereo use, both inputs (Left and Right) needs to be connected for a proper mono signal summation.
10. **XLR Balanced Input** - Fully balanced differential XLR input for sources with balanced XLR output. If your AV-Processor supports XLR connection, it is the recommended option.
11. **XLR Direct Pass-Thru** - Fully balanced differential XLR output. For daisy-chaining several subwoofers the XLR input needs to be utilized to achieve signal on the XLR output. When there is only RCA connections from the source, an RCA-XLR adapter/cable is needed.
12. **Mains power switch - Boot up** - Once flipping the power rocker switch, the amp will take approx. 30-45 seconds before it is ready to make signal selection. Signal selection and time for an actual sound present at the subwoofer will take another 5-10 seconds. This amount of time doesn't seem long, but it is different than an analog circuit which will play music almost immediately after flipping the rocker switch.

Shutdown: Flipping the rocker off will start the shutdown. During this time the LED will blink (unless it is in standby). This takes approximately 20-30 seconds. The amp is muted during this time so noises are not transferred to the outputs.

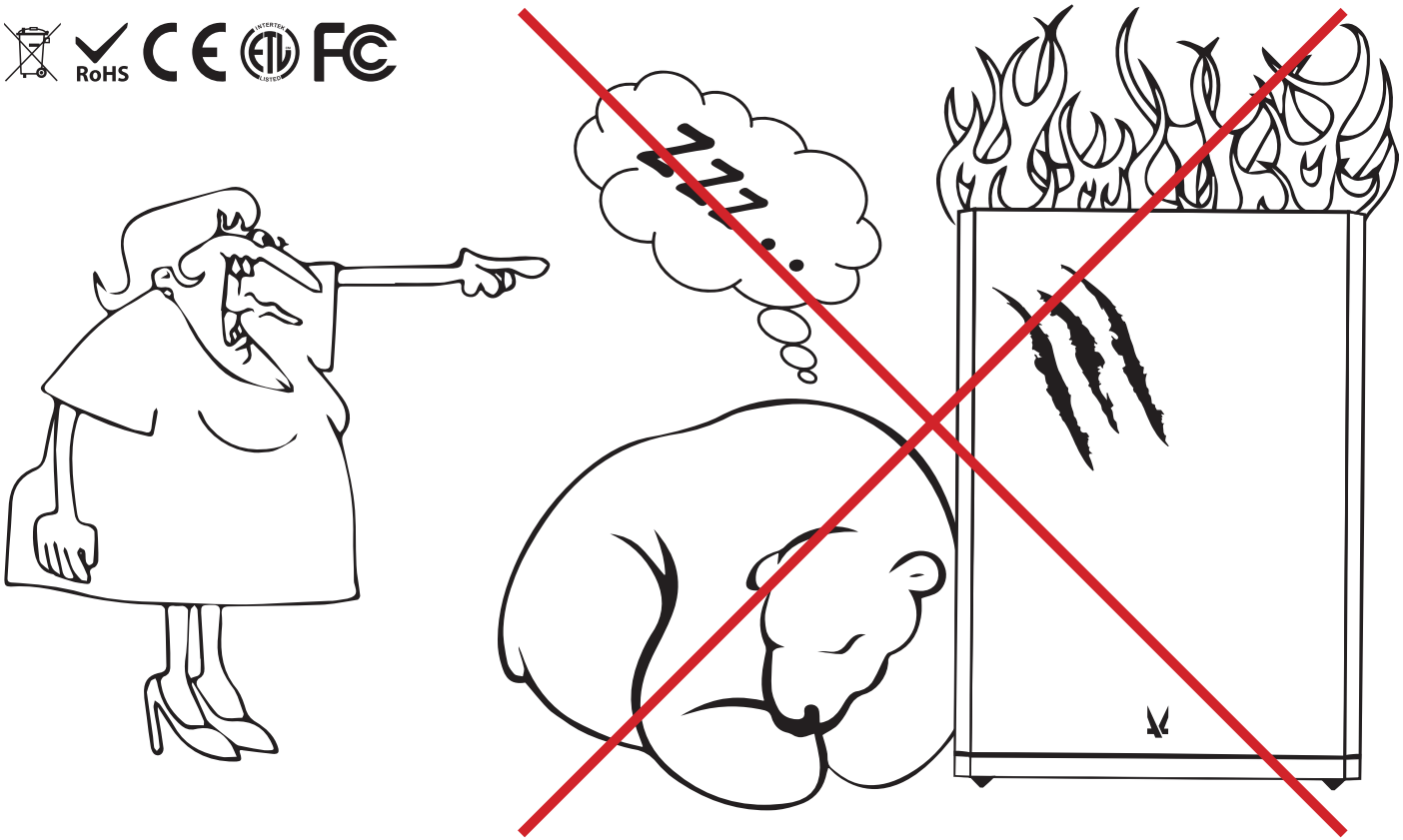
NOTE: If you try to flip the rocker back on during shutdown, the amp will give an error (red/green blinking) and not turn back on. If this happens, simply flip the rocker back off and wait for the LED to completely stop blinking, then flip the rocker on to power up. Remember it is a "mini computer" and treat as one.

13. **C18 Power inlet with fuse holder** - There is no ground pin on this amplifier. The fuse specification is printed on the amplifier board.

SAFETY INSTRUCTIONS

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- **Do not shower or bathe (with) this product. It does not like water nor soap.**
- Do not restrict the natural ventilation for this product. Do not cover amplifier plate with polar bear hide or similar as this product is built to handle even the cold northern climates without such heating devices.
- **Large house pets like dogs, big cats or bears should be trained not to cuddle or sleep against this product to avoid overheating, scratches and bite marks.**
- Clean this product only with dry cloth.
- Do not install near any heat sources such as an open fireplace, radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Protect the power cord, signal cables or speaker cables from being walked on, chewed on or pinched particularly at plugs and the point where they exit from the apparatus.
- Only use attachments and accessories specified by the manufacturer.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
- Check that there are no cables under the carpet that may be damaged by the spike/cone feet. Do not walk the product on the spike feet as this may cause them to become detached from the cabinet and cause damage. Take care not to impale yourself with the spike feet.
- Do not place this product on an unstable stand, tripod, bracket or table. The product may fall causing serious injury and serious damage. Any mounting of the product should follow the manufacturer's instructions.

- For continued protection against fire hazard, use fuses only of the correct type and rating. Mains fuses are located inside the appliance as well as on its back panel. Replacement of the internal fuse should be entrusted to an authorized operative. User-replaceable fuse types are shown in the specification.
- WARNING: To reduce the risk of fire or electric shock, this apparatus should not be exposed to rain, snow or moisture and objects filled with liquids, such as vases, should not be placed on this apparatus.
- The mains plug of the power supply cord shall remain readily operable.
- WARNING: This product is capable of producing very high sound pressure levels. Please exercise restraint in its operation to prevent hearing damage.



SICHERHEITSANWEISUNGEN

- Lesen Sie diese Anweisungen.
- Bitte diese Anweisungen aufbewahren.
- Folgen Sie diese Anweisungen.
- Bitte alle Warnungen beachten.
- Nehmen Sie keine Dusche oder Bad mit diesem Produkt. Es mag weder Wasser noch Seife.
- Die natürliche Durchlüftung darf nicht eingeschränkt werden. Dieses Produkt kann selbst die Kälte des Nordens ohne Kälteschutzmaßnahmen vertragen und darf daher mit einem Bärenfell oder ähnliches nicht bedeckt werden.
- Große Haustiere wie Hunde, Katzen oder Bären müssen abgerichtet werden, nicht mit diesem Produkt zu kuscheln oder neben dem Produkt zu schlafen, um Überhitzung, Kratzer oder Bissspuren zu vermeiden.
- Reinigen Sie dieses Produkt ausschließlich mit einem trockenen Tuch.
- Halten Sie dieses Produkt fern von Hitzequellen wie offenem Feuer, Heizungskörper, Kachelöfen oder anderen wärmestrahlenden Geräten, einschließlich Audioverstärker.
- Schützen Sie das Stromkabel, die Cinchkabel oder Lautsprecherkabel gegen Bissen, Tritten oder Quetschungen, insbesondere an Steckverbindungen und in der Nähe des Geräts.
- Verwenden Sie ausschließlich vom Hersteller spezifiziertem Zubehör.
- Trennen Sie dieses Produkt vom Strom während Gewittern oder bei längeren Zeiten ausser Betrieb.
- Jegliche Wartungen und Reparaturen müssen vom Fachpersonal durchgeführt werden. Reparaturen sind bei jedem Defekt notwendig, z.B. Schaden am Stromkabel, beschädigte Stromstecker, Flüssigkeitseintritt, kleine Objekte verloren im Produkt, Aussetzung des Regens oder der Feuchtigkeit, Fehlbetrieb oder Sturz des Produkts.
- Stellen Sie sicher, dass keine Kabel unter dem Teppich durch die Gerätefüße beschädigt werden. Bewegen Sie das Produkt nicht auf die Gerätefüße, da sie dadurch vom Gehäuse gelöst werden können und Schäden verursachen können. Vermeiden Sie, sich selbst mit den Gerätefüße aufzuspießen.
- Stellen Sie das Produkt nie auf unstabile Ständer, Stative, Tische oder Halterungen. Das Produkt kann in dem Fall stürzen und ernste Schäden/ Verletzungen herbeiführen. Die Anbringung bzw. das Aufstellen des Produkts darf ausschließlich nach den Anweisungen des Herstellers folgen.
- Um Brandgefahr zu vermeiden dürfen nur Sicherungen mit der passenden Spezifikationen verwendet werden.
- Die Netzsicherungen befinden sich im Gerät, sowie auf der Rückseite. Netzsicherungen im Gerät dürfen nur durch autorisiertes Fachpersonal ausgetauscht werden. Durch den Benutzer austauschbare Sicherungen werden in der Produktspezifikation angegeben.
- WARNUNG: Um Stromschlag oder Brandgefahr zu vermeiden, darf dieses Gerät dem Regen, der Schnee oder der Feuchtigkeit nicht ausgesetzt werden. Vasen oder andere Gefäße mit Flüssigkeiten dürfen auch nicht auf dieses Gerät gestellt werden.
- Der Stecker des Netzkabels muss jederzeit zugänglich bleiben.
- ACHTUNG: Dieses Produkt kann sehr hohe Schallpegel erzeugen. Mäßigung im Hörpegel über längere Zeiten ist angebracht, um Gehörschäden zu vermeiden.

SIKKERHETSINSTRUKSJONER

- Les disse instruksjonene.
- Ta vare på disse instruksjonene.
- Vær oppmerksom på alle advarsler.
- Følg alle instruksjonene.
- Ikke bad (med) dette produktet. Det liker ikke hverken vann eller såpe.
- Ikke begrens den naturlige ventilasjonen for dette produktet. Ikke tildekk forsterker platen med isbjørnpels eller liknende, da produktet er bygget for å håndtere selv de kaldeste nordlige klima uten slike varmeprodukter.
- Store husdyr som hund, katt eller bjørn må læres opp til å ikke kose eller sove mot produktet for å unngå overoppheting, skrap og bitemerker.
- Rens produktet kun med en tørr klut.
- Ikke installer nær varmekilder som åpent ildsted, varmeovn, peis eller andre apparater (inklusive forsterkere) som produserer varme.
- Beskytt strømkabelen, signalkabler eller høyttalerkabler fra å bli tråkket på, tygd på eller lagt i klem, spesielt nær plugg eller der de stikker ut fra apparatet.
- Benytt kun tilleggsutstyr og tilbehør som er spesifisert av produsenten.
- Koble apparatet fra strømnettet under tordenvær eller når det ikke skal brukes over lengre perioder.
- Henvis all service til kvalifisert servicepersonell. Service kreves når apparatet har blitt skadet på noe vis, som når en strømkabel eller plugg er skadet, væske har blitt sølt eller objekter har falt ut av apparatet, apparatet har vært utsatt for regn eller fuktighet, ikke har normal funksjonalitet, eller har fått støt.
- Sjekk at det ikke er kabler under teppet som kan være skadet av spike/kone føtter. Ikke flytt produktet på spike føttene da det kan føre til at de faller av kabinettet og forårsaker skade. Ta hensyn slik at du ikke blir blir spiddet av spike føttene.
- Ikke plasser dette produktet på ustabilt stativ, tripod, brakett eller bord. Produktet kan falle og forårsake seriøs skade. Montering av produktet skal følge produsents instruksjoner.
- For kontinuerlig beskyttelse mot brannfarer, bruk kun den korrekte type og verdi på sikringen(e). Hovedsikringene er lokalisert både på innsiden av produktet i tillegg til på panelet. Erstatning av de interne sikringene må gjøres av autorisert personell. Sikringer som kan byttes av bruker er vist i spesifikasjonene.
- ADVARSEL: For å redusere faren for elektrisk støt, må apparatet ikke utsettes for regn, snø eller fuktighet og gjenstander fylt med væske slik som vaser, skal ikke plasseres på apparatet.
- Strømkabelen til strømforsyningen skal være lett tilgjengelig.
- ADVARSEL: Dette produktet kan yte veldig høye lydtrykk. Vennligst vis aktsomhet for å unngå hørselsskader.

INSTRUCCIONES DE SEGURIDAD

- Lea estas instrucciones.
- Guarde estas instrucciones.
- Siga todas las advertencias.
- Siga todas las instrucciones.
- No se duche o bañe con este producto. El agua y el jabón dañarán este producto.
- No impida la ventilación natural de este producto. No cubra el amplificador con una piel de oso polar o una protección contra el frío similar. Este producto está diseñado para resistir incluso el clima frío del norte sin necesidad de calentadores.
- Animales domésticos de gran tamaño como perros, gatos o incluso osos han de ser instruidos para que no se acurruquen o duerman pegados a este producto para evitar sobrecalentamiento, rayaduras o marcas de dientes.
- Limpie este producto exclusivamente con un paño suave y seco.
- No instale este producto junto a fuentes de calor como radiadores, chimeneas, hornos u otros aparatos que produzcan calor (amplificadores incluidos).
- Proteja el cable de alimentación, los cables de señal y los cables de altavoz ante posibles pisotones, mordiscos o pinzaduras, especialmente cerca de los conectores y de las entradas/salidas del equipo.
- Use tan solo accesorios especificados por el fabricante.
- Desconecte este aparato durante tormentas eléctricas o períodos largos sin uso.
- Remita el equipo a personal cualificado para cualquier reparación. Una reparación será necesaria en caso de cualquier daño, como por ejemplo en el cable de alimentación o su enchufe, líquidos vertidos sobre el equipo, objetos perdidos dentro del equipo, exposición a lluvia o humedad, caídas o funcionamiento defectuoso.
- Compruebe que los cables no son pisados por los pies de apoyo del producto. No traslade este producto sobre sus pies de apoyo, ya que podrían aflojarse y causar daños. Evite empalar cualquier parte de su cuerpo con los pies de este producto.
- No coloque este producto sobre un soporte inestable. El producto podría caer, causando heridas y daños serios. El montaje de este producto ha de seguir las instrucciones del fabricante.
- Use tan sólo fusibles del tipo y especificación correctos a fin de evitar peligros de incendio. Los fusibles están situados dentro de este aparato, así como en su panel posterior. El reemplazo de fusibles debe ser realizado por personal cualificado y autorizado. Los fusibles que pueden ser reemplazados por el usuario se muestran en las especificaciones técnicas.
- ADVERTENCIA: no exponga este aparato a lluvia, nieve, o humedad ni coloque sobre él objetos con líquidos, como jarrones, a fin de reducir el riesgo de fuego o shock eléctrico.
- El enchufe de corriente del cable de alimentación debe permanecer accesible en todo momento.
- ADVERTENCIA: este producto es capaz de general niveles de presión sonora muy elevados. Úselo con la debida contención a fin de evitar daños auditivos.


ARENDAL

WARRANTY

Luckily for you and for us, Arendal Sound products are extremely durable products which have gone through extreme stress tests during development. However failures may happen and if it does, you will always know we are here to backing you up.

Arendal Sound have up to 10 Years warranty (5 for electronics) which cover all costs for you as a customer within the warranty terms. We are also accepting warranty to follow second hand purchases where sales receipt is proof of purchase which new owner needs to get from original buyer.

All Arendal Sound products can easily be repaired by the customer, by replacing components yourself. This means we may send you the replacement part/module which is needed, instead of sending the complete product back and forth, this saves down time and you will be guided by qualified staff from the Arendal Sound team. We will only ask you to do very simple steps to fix the products and you do not need any servicing experience at all. In the unfortunate event of a product failure, it will usually only take a few days to get the problem fixed.

If you have a problem with your product, please contact ***service@arendalsound.com***, send us the serial number of the product that has a problem and we will help you to identify the defective component.
If we ship you a replacement part for your product, that you can swap out by yourself, we will send pre-paid return labels to return the defective part to us. This part must be returned or you will be invoiced for the replacement part in full. Every cost is covered by us if the product is under warranty. Should you prefer to send the entire product back to us for service - please contact us at ***service@arendalsound.com***. When sending the product back to us it is important that you use the original packaging or something of similar quality. We are not responsible for damage caused by inadequate packaging but we will be helpful with arranging the return shipment.

Important!
Do not try to repair the product without permission from us. Disassembling or removing parts from your product(s) in one way or another, can damage your product(s) without the right instructions. It will void your warranty rights.

Non-authorized sales
Any sales done outside arendalsound.eu or lsound.eu (or belonging domains) are non- authorized and will therefore not be under our warranty. Please email us at ***sales@arendalsound.com*** if you have any questions.

REGISTER YOUR PRODUCT AT

ARENDALSOUND.COM/WARRANTY

TO APPLY FOR 10 YEAR WARRANTY.