



# Clarus-Series Subwoofers

## Installation & Reference Manual



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# Congratulations on your Clarus Subwoofer purchase, and welcome to the world of Hybrid Audio Technologies!

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We realize that you have a choice in loudspeakers, and are thrilled that you have chosen the Clarus series subwoofer drivers. For more information about Hybrid Audio Technologies, our philosophies regarding high-end mobile audio, to learn more about our lifetime guaranteed value program, and for information about our other products, please visit us at: [hybrid-audio.com](http://hybrid-audio.com)

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## Welcome and Introduction by Scott Buwalda - Founder

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**Speaker development is our passion! When installed and set-up properly, the Clarus Subwoofer you have purchased will make a remarkable improvement in the sound quality of virtually any mobile audio sound system and give years of superior performance.**

**With the publication of this manual, it is our goal to assist the “do it yourself” enthusiast and professional installer alike in getting the highest level of performance out of Clarus subwoofer drivers using straight-forward installation advice.**

**Thank you, and happy listening!**



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# The Clarus Subwoofer

## A Brief History

**Building on the enthusiastic reception garnered for the Imagine series subwoofers, Hybrid Audio Technologies began working on an enhanced line-up of subwoofers in the Clarus range starting in mid-2012. The exhaustive process of developing a complete line-up of low-inductance, low-distortion subwoofers was realized over an approximate calendar year in research and development, and real-world testing, resulting in the Clarus subwoofer(s) now in your hands.**

The Stage II Imagine I6SW 6.5-inch subwoofer was the first dedicated low-frequency driver ever offered by Hybrid Audio Technologies. Within time, the Imagine subwoofer line-up was deemed complete with four different sizes (6.5-inch, 8-inch, 10-inch and 12-inch). Feedback for the Imagine subwoofers was amazing, but we quickly realized that users of our super high-end drivers, such as those from the Clarus, Legatia, Legatia Pro, and Legatia SE series were interested in a higher-end offering in the subwoofer category.

The design efficacy of the Clarus subwoofers includes immediate upgrade potential with Imagine series subwoofers in similarly-sized enclosures and hole-cut-out diameters. Other features boasting elevated performance over the Imagine subwoofer counterparts include increased nominal and thermal power handling, lower inductance, larger displacement courtesy of longer linear X<sub>max</sub>, and the option of two dual voice coil alignments (dual two ohm and dual four ohm), allowing for a wide variety of connection options.

The Clarus subwoofers were originally designed to satisfy the typical 8-inch, 10-inch, and 12-inch sizes. Due to an incredible amount of feedback from our enthusiast community and dealer base for a true high-end large-diameter sound quality subwoofer, we developed the 15-inch driver to compliment the other three sizes.

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## Attributes

### Basket/Frame

The basket of the C8SW, C10SW, C12SW, and C15SW is a cast aluminum design with semi-gloss black powder coating. The frame includes spider venting for improved thermal power handling. The frame includes reverse-roll surround tooling proprietary to Hybrid Audio Technologies, allowing for close-tolerance flush and iso-mounting for easy grille clearance and locational clearance.

### Motor and Voice Coil

The motor of the Clarus subwoofer is conventional dynamic with a large, high-grade ferrite magnet assembly with bumped and vented pole piece. The voice coil diameter for the four subwoofers is 51mm (2-inch) for elevated power handling, dissipation of heat (thereby lowering power compression), and maximizing the size of the magnet around the voice coil for enhanced motor compliance. The voice coil is a four-layer, high-purity aluminum, which is superior to copper for heat dissipation, as well as significantly reduced moving mass. The result is an extremely light weight winding, with low inductance and good power handling.

### Suspension, Cone, Tinsel Leads & Terminals

The inverted surround is butyl rubber which is highly consistent, and does not suffer the variance of natural rubbers. This rubber surround terminates mechanical vibrations well, having a low stiffness for positive damping of resonances. The spider material was chosen for optimal performance; the spider is a 90/10 cotton/Nomex blend with single-dip low viscosity phenolic. This material provides the stiffness desired without being overly brittle or stiff,

where vibrations in the spider are well damped and do not translate into the former or the cone.

The Clarus subwoofers are cone-type drivers consisting of a polypropylene diaphragm with low moving mass. Polypropylene provides a good balance of strength, moving mass, and water resistance, in the event the Clarus subwoofers are used in all-weather climates, such as motorcycle, ATV, golf cart, and marine uses. The tinsel leads are bonded directly to the former and brought out to the terminals, which keeps tinsel lead slap to a minimum and does not compromise the structural integrity of the cone. The Clarus subwoofers come equipped with heavy-duty PCB-mounted nickel-plated push terminals, and give the end user flexibility in tinned wire or crimp terminal terminations.

## Summary

The Clarus subwoofers are the ideal multi-format subwoofer speaker system, and are an upgrade for the Imagine-series subwoofer drivers. At home in virtually any enclosure arrangement – from sealed, to vented, to infinite baffle and bandpass – the Clarus range of subwoofers are going to impress even the most critical listener with speed and articulation, bottom-octave authority, with a total inductance profile that is not just low, but flat over stroke, frequency, and power. You'll know how serious this driver is at first glance as you take in the cast frame and heavy-duty nickel-plated spring-loaded push terminals, but its proof will be upon first listen as the Clarus subwoofer does what it does best: articulating the nuances of your favorite recordings to effectively reproducing significant sound pressure levels.

# Clarus Subwoofers Specifications & Parameters

† Typically, in-car response including vehicular “cabin gain”, or the gain expected with subwoofer(s) installed in the vehicle, will result in an extended subbass response. This is a result of these frequencies being below the lowest resonance in the vehicle (typically around 50-70 Hz in most vehicles). In more practical terms, install the Clarus subwoofer(s) into your vehicle and you will see a dramatic improvement in subbass and midbass output, much more so than just simply listening to the Clarus in a large room, or worse yet, “free air” (we don’t recommend even trying the Clarus subwoofers in “free air” without some form of recommended enclosure).

	C8SW-D2	C8SW-D4	C10SW-D2	C10SW-D4	C12SW-D2	C12SW-D4	C15SW-D2	C15SW-D4
Overall Diameter	φ209.5 mm	φ209.5 mm	φ273 mm	φ273 mm	φ314 mm	φ314 mm	φ388.5 mm	φ388.5 mm
Mounting Depth	106 mm	106 mm	125.5 mm	125.5 mm	138 mm	138 mm	197 mm	197 mm
Bolt Circle Diameter	φ197 mm	φ197 mm	φ257.5 mm	φ257.5 mm	φ304 mm	φ304 mm	φ373.5 mm	φ373.5 mm
Mounting Hole	φ185 mm	φ185 mm	φ248 mm	φ248 mm	φ279 mm	φ279 mm	φ353.5 mm	φ353.5 mm
Pnom Rated Power Input (AES Standard)	170 watts	170 watts	225 watts	225 watts	250 watts	250 watts	800 watts	800 watts
Pmax Rated Power Input (AES Standard)	340 watts	340 watts	450 watts	450 watts	500 watts	500 watts	1600 watts	1600 watts
Frequency Response (+/- 3dB)	41 - 1500 Hz	41 - 1500 Hz	33 - 1500 Hz	33 - 1500 Hz	30 - 1000 Hz	30 - 1000 Hz	23 - 800 Hz	23 - 800 Hz
Efficiency 2.83V/1 meter	87 dB	87 dB	88 dB	88 dB	89 dB	89 dB	88 dB	88 dB
Mms	63.5 g	63.5 g	113 g	113 g	125 g	125 g	349 g	349 g
Cms	236 um/N	236 um/N	210 um/N	210 um/N	186 um/N	222 um/N	135 um/N	125 um/N
BL Series / Parallel (T*m)	12.1 / 6.51	17.6 / 9.43	17.3 / 8.5	22.6 / 11.2	16.9 / 8.5	20.7 / 10.8	22.6 / 11.3	31.5 / 14.7
Voice Coil Diameter	50 mm	75 mm	75 mm					
Impedance Series / Parallel	4 Ω / 1 Ω	8 Ω / 2 Ω	4 Ω / 1 Ω	8 Ω / 2 Ω	4 Ω / 1 Ω	8 Ω / 2 Ω	4 Ω / 1 Ω	8 Ω / 2 Ω
DC Resistance Series / Parallel	3.6 Ω / 0.9 Ω	6.8 Ω / 1.7 Ω	3.6 Ω / 0.9 Ω	6.8 Ω / 1.7 Ω	3.6 Ω / 0.9 Ω	6.8 Ω / 1.7 Ω	3.6 Ω / 0.9 Ω	6.8 Ω / 1.7 Ω
Fs (Free Air)	41 Hz	41 Hz	33 Hz	33 Hz	30 Hz	30 Hz	23 Hz	23 Hz
Qms	7.534	7.534	9.575	8.71	9	8.1	11.9	11.6
Qes	0.361	0.361	0.279	0.31	0.36	0.44	0.36	0.42
Qts	0.345	0.345	0.271	0.3	0.34	0.42	0.35	0.40
Xmax (Two Way)	21 mm	25 mm	29.6 mm	33 mm	35.8 mm	37 mm	48 mm	47 mm
Vas	15.7 L	15.7 L	33.1 L	33.1 L	60.2 L	60.2 L	104 L	104 L
Le	2.204 mH + 2.214 mH	3.632 mH + 3.620 mH	2.394 mH + 2.334 mH	3.938 mH + 3.855 mH	2.475 mH + 2.454 mH	3.946 mH + 3.966 mH	3.946 mH + 3.966 mH	4.095 mH + 4.115 mH
Sd	21,642 mm <sup>2</sup>	21,642 mm <sup>2</sup>	33,329 mm <sup>2</sup>	33,329 mm <sup>2</sup>	47,723 mm <sup>2</sup>	47,723 mm <sup>2</sup>	73542 mm <sup>2</sup>	73542 mm <sup>2</sup>

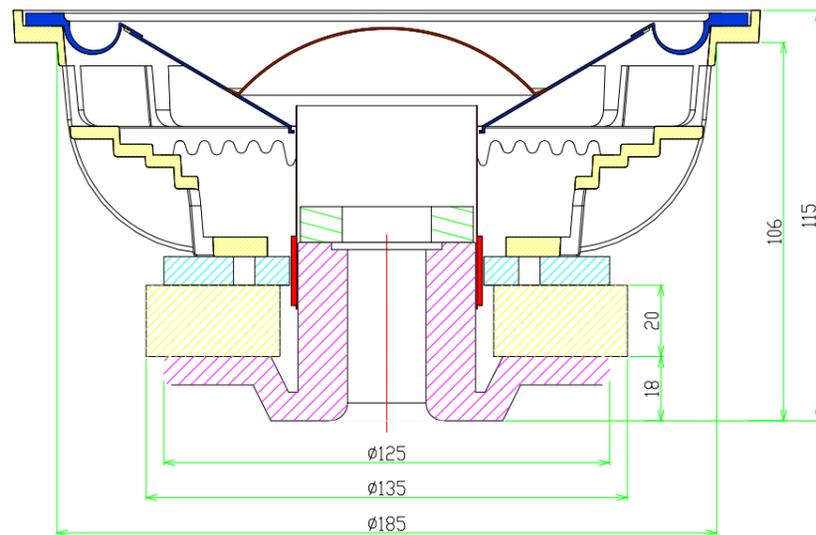
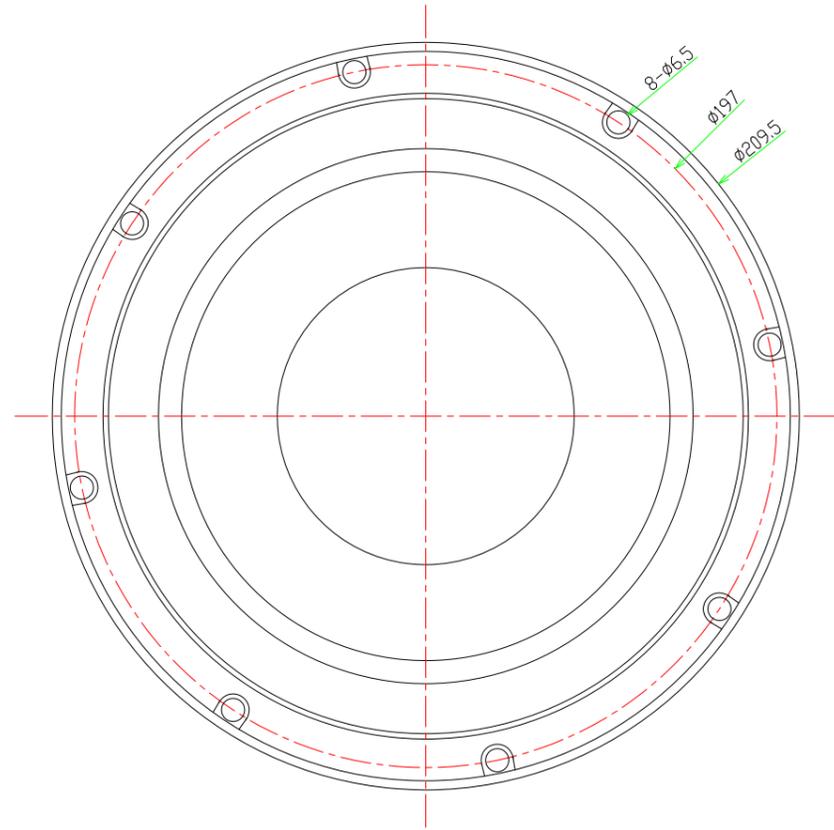
# Clarus Subwoofers Enclosure Recommendations

		Trunk		SUV / Hatch / Wagon	
		Vented	Sealed	Vented	Sealed
C8-D2/D4	Vb	19.00 liter	18 liter	24.00 liter	22 liter
	Av	20.25 cm <sup>2</sup>		20.25 cm <sup>2</sup>	
	Lv	24.00 cm		22.00 cm	
C10-D2/D4	Vb	23.00 liter	22 liter	36.00 liter	24 liter
	Av	20.25 cm <sup>2</sup>		45.57 cm <sup>2</sup>	
	Lv	22.00 cm		24.00 cm	
C12-D2/D4	Vb	47.00 liter	40 liter	52.00 liter	41 liter
	Av	45.57 cm <sup>2</sup>		45.57 cm <sup>2</sup>	
	Lv	24.00 cm		20.00 cm	
C15-D2/D4	Vb	50.00 liter	44 liter	54.00 liter	46 liter
	Av	45.57 cm <sup>2</sup>		45.57 cm <sup>2</sup>	
	Lv	30.00 cm		26.00 cm	

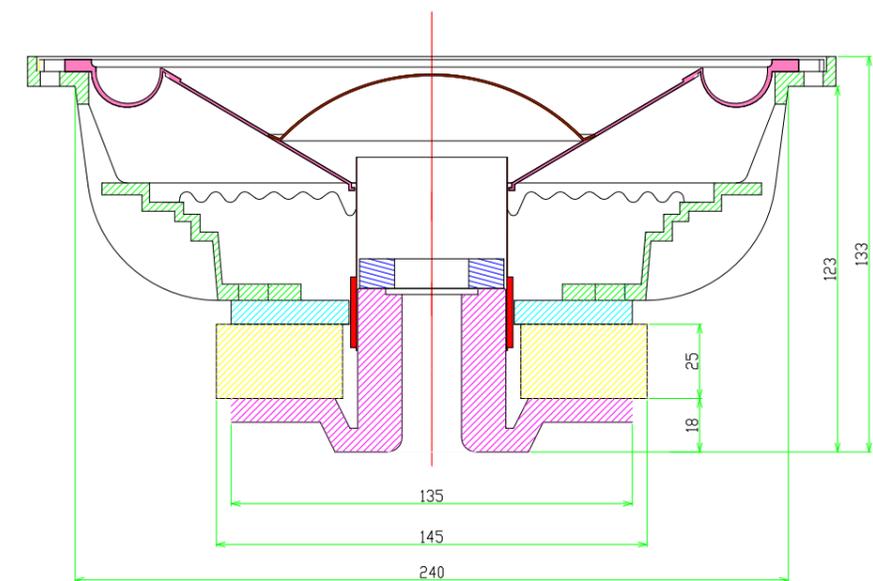
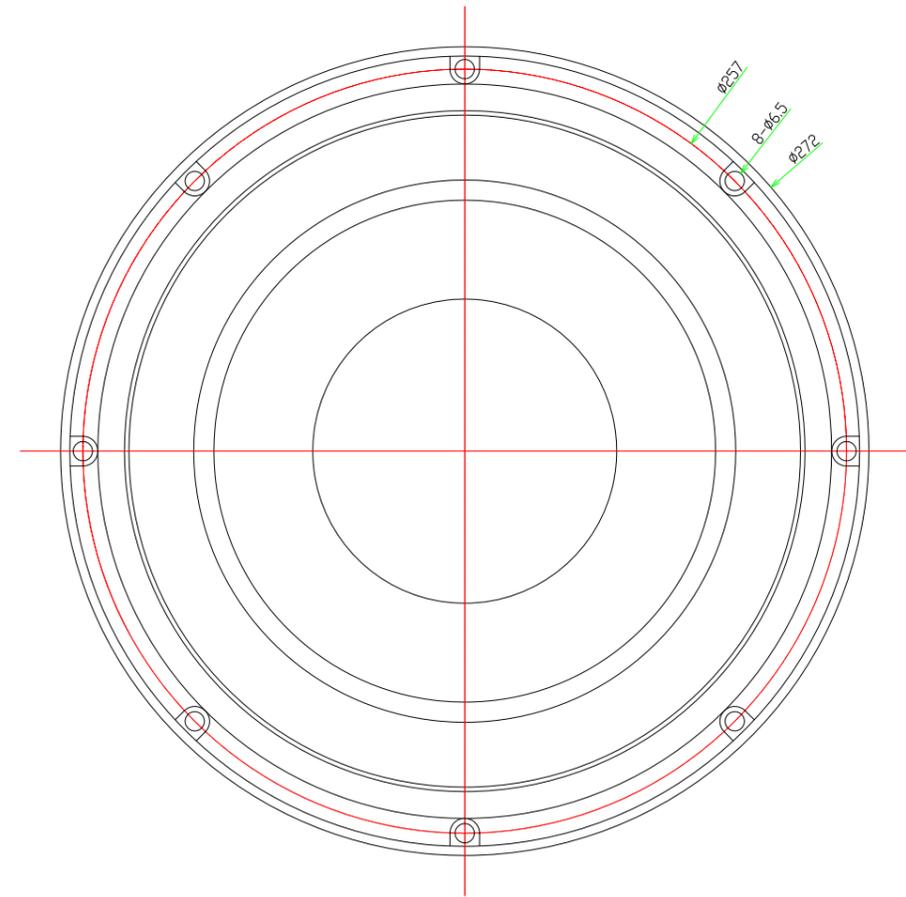
The user is encouraged to determine if the application most replicates that of a “trunk” or “boot” installation, or an installation in an SUV, hatchback, or wagon.

**Vb = Volume of box**  
**Av = Area of vent**  
**Lv = Length of vent**

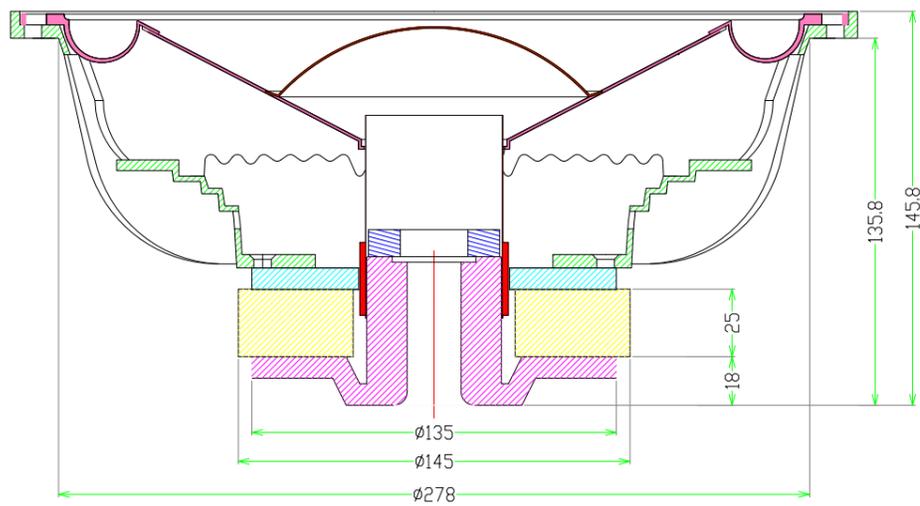
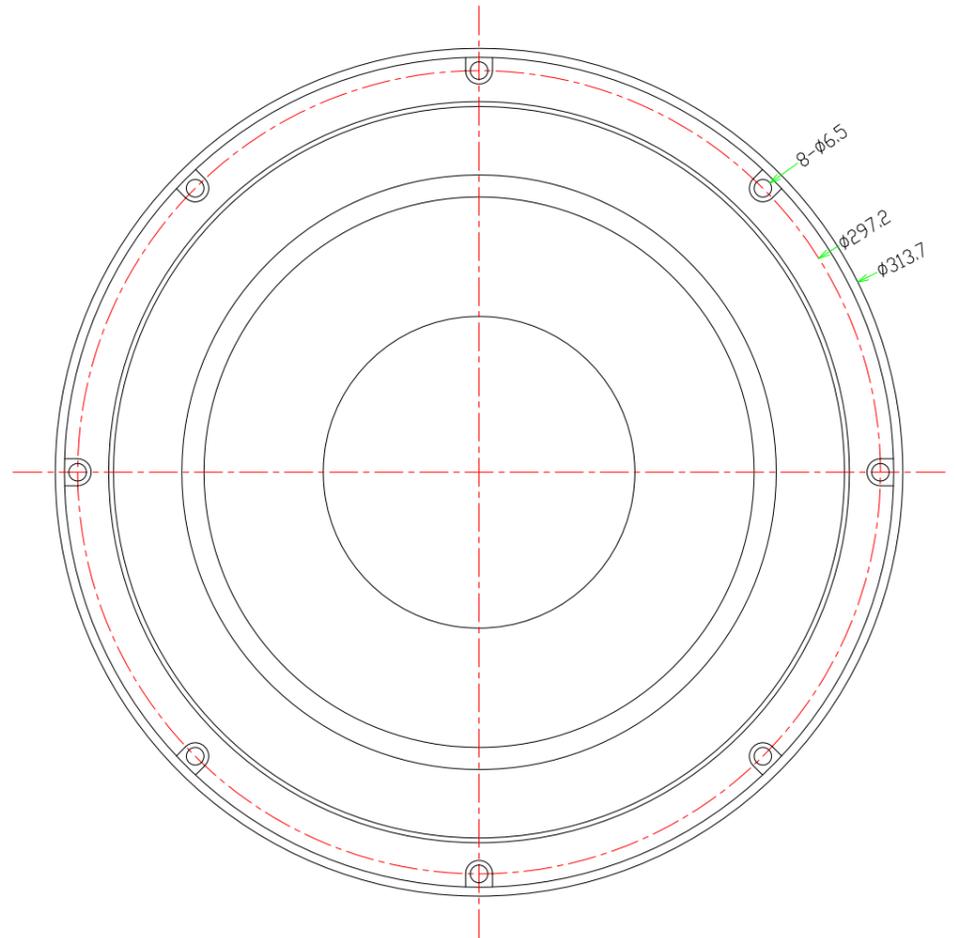
# Clarus C8SW Mechanical Drawing



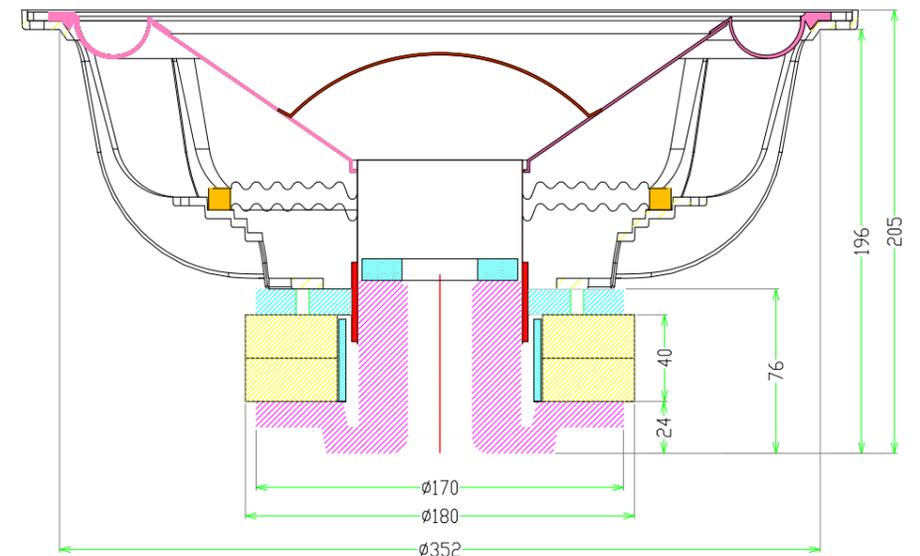
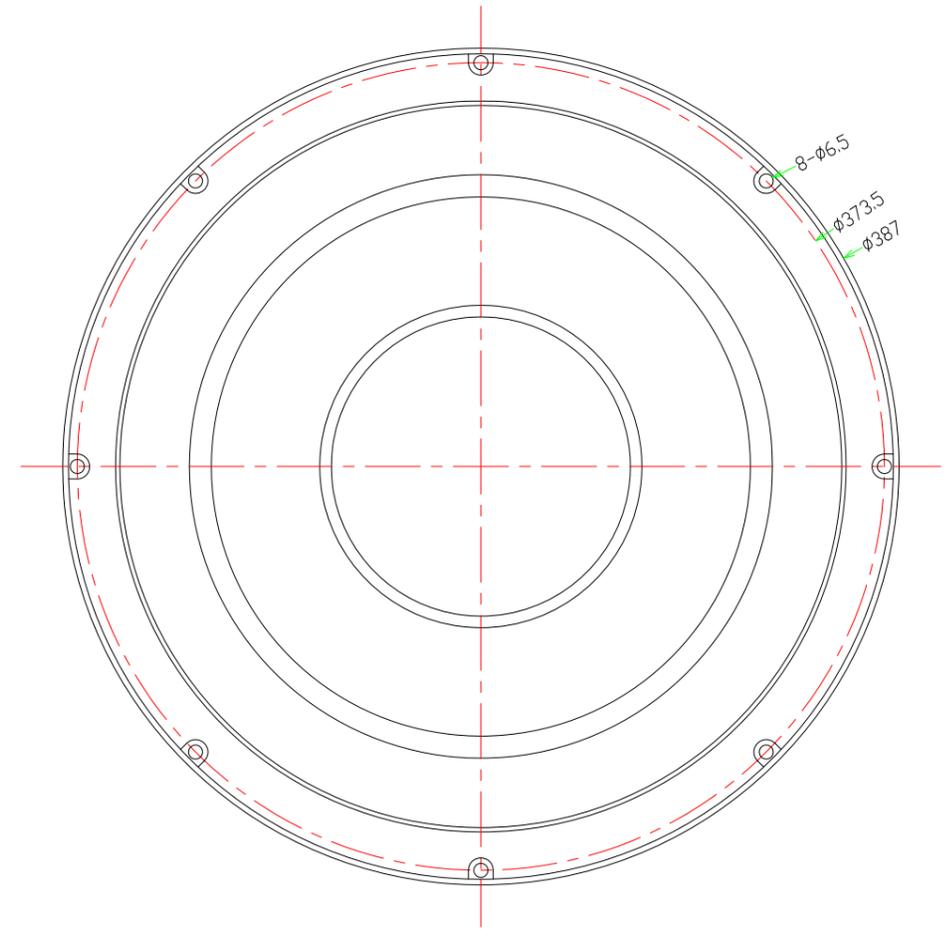
# Clarus C10SW Mechanical Drawing



# Clarus C12SW Mechanical Drawing



# Clarus C15SW Mechanical Drawing



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## Clarus Subwoofer Warranty

Hybrid Audio Technologies extends a limited one-year warranty to the original purchaser when self-installed, and three years warranty when installed by a certified Hybrid Audio Technologies dealer (United States only), and hereby certifies that this product will be free from defects in materials and workmanship under normal and proper use for one year from the date of purchase.

Hybrid Audio Technologies' responsibility under this warranty is limited to replacing or repairing, at Hybrid Audio Technologies' option, products or parts determined by Hybrid Audio Technologies to be defective either in materials, or workmanship. To attain warranty service, the customer must deliver the product or the defective part(s), appropriately packed with proof of purchase date, to an authorized Hybrid Audio Technologies dealer. In the event that a direct return from a consumer is required, the consumer must obtain from Hybrid Audio Technologies a return authorization number, and ship the defective product directly to Hybrid Audio Technologies. All shipping expenses are the customer's responsibility. If the product has been updated or superseded, a replacement will be made with a current model of the same quality and function. Warranty of the replacement parts is limited to 90 days or the unexpired portion of the warranty

period of the product on which the parts are being used, whichever is longer.

This warranty does not cover any defects or costs caused by: (1) modification, alteration, repair or service of this product by any persons or company other than Hybrid Audio Technologies; (2) physical abuse to, overload of, or misuse of, the product or operation thereof in a manner inconsistent with the use indicated in the instructions; (3) any use of the product other than that for which it was intended; or (4) shipment of the product to Hybrid Audio Technologies for service. This warranty does not cover labor costs.

Hybrid Audio Technologies is not liable for any special incidental or consequential damages, including, but not limited to, personal injury, property damage, damage to or loss of equipment, loss of profits or revenue, costs of renting or buying replacements and/or any other additional expenses, even if Hybrid Audio Technologies has been informed of the prospect of such damages. Any express warranty not provided herein, and any remedy which other than the warranty contained herein might arise by inference or operation of law, is hereby excluded and disclaimed including the implied warranties of merchantability and of the fitness for a particular purpose.

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## Thank You!

Hybrid Audio Technologies is delighted that you have chosen a Clarus subwoofer for your high-end mobile audio sound system. We are convinced that a great product offering, backed up with unsurpassed customer service and technical support will advance the Hybrid Audio Technologies namesake in the coming years. We are pleased that you have joined us in our "new generation of in-car audio."

If there is anything we can do to help you get the most out of your Clarus installation, please do not hesitate to email us at: [support@hybrid-audio.com](mailto:support@hybrid-audio.com), by phone: 770.888.8200, or by visiting us at: [hybrid-audio.com](http://hybrid-audio.com)



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