

LIMITED WARRANTY

BRAVOX S/A warrants this product to be free of defects in material and workmanship for a period of one (1) year from the date of original purchase.

This warranty is not transferable and applies only to the original retail purchaser of the product from an authorized **BRAVOX** dealer. Should service be necessary under this warranty for any reason due to manufacturing defect or malfunction, **BRAVOX** will, at its sole option, repair or replace the defective product with new or remanufactured product at no charge.

This warranty is void and inapplicable if **BRAVOX** deems that product has been used or handled other than in accordance with instructions provided by manufacturer, including but not limited to damage caused by accident, mishandling, improper installation, abuse, negligence, or normal wear and tear, or any defect caused by repair to the product by anyone other than **BRAVOX** or an authorized **BRAVOX** dealer.

Repair or replacement under this warranty is the exclusive remedy of the consumer/purchaser. **BRAVOX** shall not be responsible for any incidental or consequential damages, except to the extent provided (or prohibited) by applicable law.

THERE ARE NO OTHER WARRANTIES, INCLUDING WITHOUT LIMITATION, EITHER EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE PRODUCT.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

CAUTION:

Prolonged exposure to sound pressure levels in excess of 100 dB can cause permanent hearing loss. This high-performance speaker can exceed this level. Please listen using common sense and restraint, in order to preserve your ability to enjoy its fidelity.


"I HAVE WORKED WITH BRAVOX FOR OVER SEVEN YEARS AND CONSIDER THEM TO BE ONE OF THE BEST SPEAKER COMPANIES I HAVE EVER BEEN ASSOCIATED WITH. BRAVOX CAR AUDIO AND HOME THEATER SPEAKERS ARE NOT ONLY WELL BUILT AND WELL ENGINEERED, BUT ALSO SOME OF THE BEST SOUNDING SPEAKERS I HAVE EVER DESIGNED WITH. HIGHLY RECOMMENDED !"

VANCE DICKASON

NEW EXPANDED SIXTH EDITION


The LOUDSPEAKER DESIGN Cookbook

Everything you need to know to build the dream loudspeaker system for your home, your car, or your new home theater, but thought you couldn't afford it. Easy ways to pick exactly the right parts, tones, and phasings to build your music to perfection. More on how to do the correct way every loudspeaker system. Proven designs, a world of the best tones, and easy ways to test the results for yourself.



by Vance Dickason

HIGHLY RECOMMENDED



CAR AUDIO
BRAVOX
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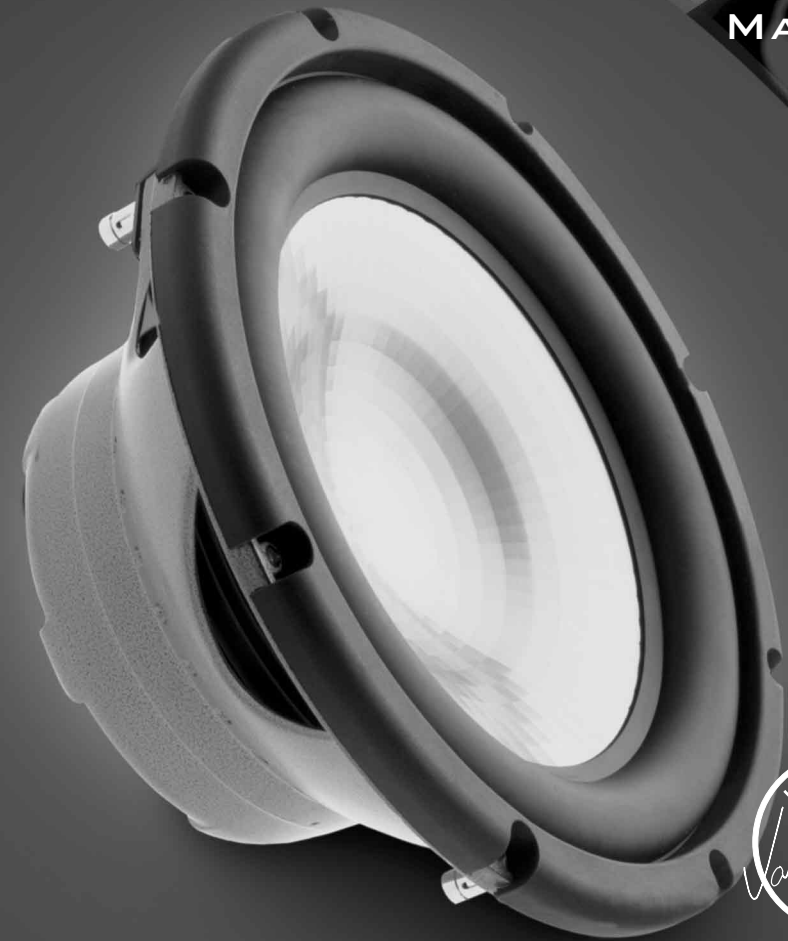
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Printed in Brazil

EXTREME DUTY

SUBWOOFERS & MIDBASS

OWNER'S MANUAL



CAR AUDIO



BRAVOX

Dear Customer,

Thank you for choosing BRAVOX !

The BRAVOX EXTREME DUTY SUBWOOFER you purchased represents the ultimate in car audio low-frequency reproduction and was designed to produce not only high SPL, but high SPL with both low distortion and extended bass response. This EXTREME DUTY SUBWOOFER is the result of a combination of advanced Acoustic Engineering and state-of-the-art manufacturing. BRAVOX engineers have managed to blend some of the car audio industry's most innovative technologies and the latest 21st century materials into the **EXTREME DUTY SUBWOOFERS**.

TECHNICAL SPECIFICATIONS

Model	Size	Type	Z (ohms)	F0 (Hz)	Vas (L)	Qes	Qts	Xmax (mm)	Sd (m ²)	SPL (dB/m/2.83V)	Power handling Max/Nom.(watts)
EXS10D-2	10"	SW	DVC 2+2	30	45	0.50	0.46	11	0.0363	87	800/400
EXS10D-4	10"	SW	DVC 4+4	30	48	0.48	0.45	11	0.0363	87	800/400
EXS12D-2	12"	SW	DVC 2+2	27	70	0.50	0.46	11	0.0523	87	1000/500
EXS12D-4	12"	SW	DVC 4+4	27	80	0.55	0.50	11	0.0523	87	1000/500
EXS15D-2	15"	SW	DVC 2+2	23	150	0.43	0.39	11	0.0804	88	1200/600
EXS15D-4	15"	SW	DVC 4+4	23	170	0.51	0.46	11	0.0804	88	1200/600
EXS6	6"	MB	SVC 4	90	5	0.88	0.80	2.5	0.0133	88	200/100

SW - Subwoofer

MB - Mid bass

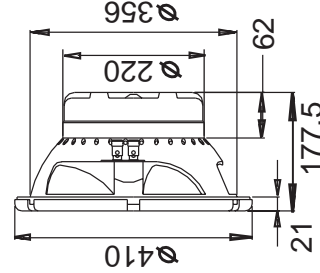
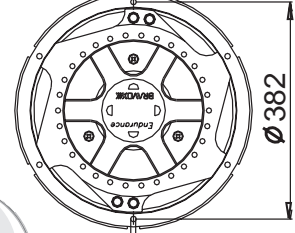
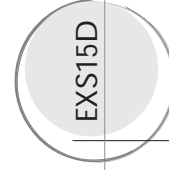
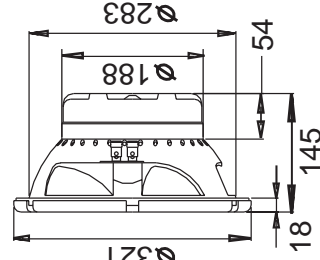
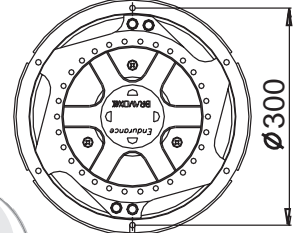
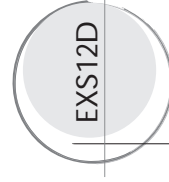
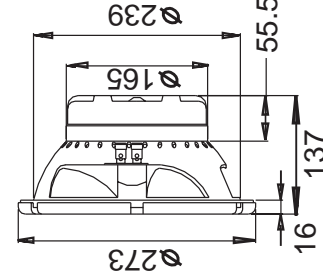
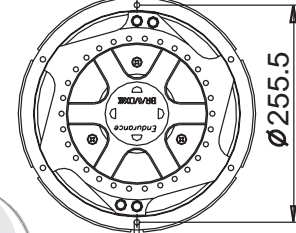
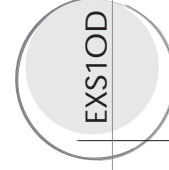
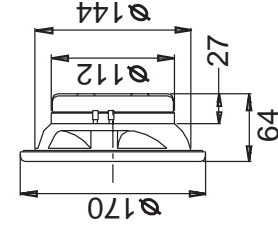
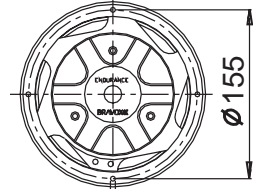
SVC - Single voice coil

DVC - Double voice coil

-2- EXTREME DUTY SUBWOOFERS & MIDBASS

BRAVOX

DIMENSIONS

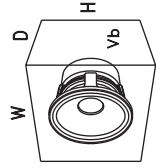


-7- EXTREME DUTY SUBWOOFERS & MIDBASS

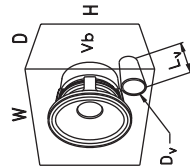
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RECOMMENDED ENCLOSURES

SEALED ENCLOSURE



VENTED ENCLOSURE



	Sealed Enclosure			Vented Enclosure		
	Response	Volume Net Int	External Dimensions H x W x D	Volume Net Int	Port	
					Dv	Lv
EXS 10D-2	Normal	0.88 ft3 24.9 l	13" x 17" x 10" 330mmx432mmx254mm	1.27 ft3 36.0 l	4" 102mm	17" 432mm
	Enhanced Bass	0.57 ft3 16.2 l	12" x 14" x 9" 305mmx356mmx229mm	1.27 ft3 36.0 l	4" 102mm	12" 305mm
EXS 10D-4	Normal	0.88 ft3 24.9 l	13" x 17" x 10" 330mmx432mmx254mm	1.27 ft3 36.0 l	4" 102mm	17" 432mm
	Enhanced Bass	0.57 ft3 16.2 l	12" x 14" x 9" 305mmx356mmx229mm	1.27 ft3 36.0 l	4" 102mm	12" 305mm
EXS 12D-2	Normal	1.23 ft3 34.8 l	15" x 20" x 10" 381mmx508mmx254mm	1.63 ft3 46.2 l	4" 102mm	16" 406mm
	Enhanced Bass	0.79 ft3 22.3 l	14" x 16" x 9" 356mmx406mmx229mm	1.63 ft3 46.2 l	4" 102mm	8" 203mm
EXS 12D-4	Normal	1.55 ft3 44.0 l	16" x 21" x 11" 406mmx533mmx279mm	1.76 ft3 50.0 l	4" 102mm	16" 406mm
	Enhanced Bass	0.79 ft3 22.3 l	14" x 16" x 9" 356mmx406mmx229mm	1.76 ft3 50.0 l	4" 102mm	8" 203mm
EXS 15D-2	Normal	1.63 ft3 46.2 l	16" x 22" x 11" 406mmx559mmx279mm	2.02 ft3 57.4 l	4" 102mm	15" 381mm
	Enhanced Bass	1.25 ft3 35.4 l	16" x 19" x 10" 406mmx483mmx254mm	2.02 ft3 57.4 l	4" 102mm	7" 178mm
EXS 15D-4	Normal	2.02 ft3 57.4 l	17" x 23" x 12" 432mmx584mmx305mm	2.12 ft3 60.1 l	4" 102mm	14" 356mm
	Enhanced Bass	1.25 ft3 35.4 l	16" x 19" x 10" 406mmx483mmx254mm	2.12 ft3 60.1 l	4" 102mm	6" 152mm

* Enclosure dimensions listed are external dimensions which assume the use of 0.75inch (19mm) thick material

-6- EXTREME DUTY SUBWOOFERS & MIDBASS

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MAIN FEATURES

OVERMOLDED TPR EXTRA WIDE SURROUND

TPR/Santoprene injection molded surround provides high bass output and low distortion

TPR INJECTED SPIDER

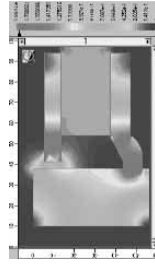
TPR/Santoprene injection molded spider, fatigue proof for long term mechanical stability

HEAVY DUTY DOUBLE VOICE COIL

High Temp 500° F dual voice coil on Fiberglass former for high SPL, low distortion and extreme power handling

COMPUTER OPTIMIZED MAG-NET SYSTEM

FEA (Finite Element Analysis) computer optimized magnet design guarantees high SPL with low distortion



HIGH STIFFNESS PARABOLIC CONE

Poly/Mica/Glass Spheres (PMGS) mold injected faceted cone (patented). High stiffness for light, clean and extremely defined bass.

MONOBLOC CAST FRAME

High Stiffness Cast Frame, provides distortion free bass reproduction and increases power handling, due to heatsink effect.

EXTEND POLE

EPP (Extend Pole Piece) provides higher power handling and lower distortion

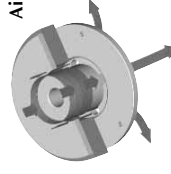
GOLD PLATED TERMINALS

Gold plated terminals for maximum power transfer from your amplifier

PERIPHERAL VENTING

PVC (Peripheral Voice Coil Cooling) allows rapid removal of heat around voice coil for extreme high power handling

Air flow



-3- EXTREME DUTY SUBWOOFERS & MIDBASS

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INSTALLATION - ENCLOSURES

BRAVOX EXTREME DUTY SUBWOOFERS have been specially designed to produce outstanding results in both small volume sealed and small volume vented enclosures. While it is possible for the advanced installer to use the Thiele/Small parameters provided in the chart at page 2 to design their own enclosures (for more on “doing it yourself”, check out Vance Dickason’s Loudspeaker Design Cookbook, 6th Edition at www.audioXpress.com), all this work has been done for you and provided in the recommended enclosure charts. The choice of which type of enclosure, vented or sealed, is strictly up to you. As a rule, sealed enclosures provide better transient (read that “quicker”) bass response than their vented counterparts, although the vented enclosures generally provide more deep bass. Your choice should be based on the amount of space available and the size of the vehicle. In general, smaller vehicles (Corvettes to Camry’s) probably work best with sealed enclosures while larger vehicles such as SUV’s, Vans, large trucks or RV’s can benefit from the kind of performance available from vented enclosures. However, both enclosure types will work in any situation.

SEALED ENCLOSURES

This enclosure is made up of a totally closed, air-tight box. This type of enclosure gives excellent, tight bass response, as well as providing an effective control of loudspeaker excursion, maintaining it within reasonable limits and generally providing lower distortion and very high volume levels. If you build your own enclosure, **BRAVOX** recommends that you glue and screw all joints using enough glue to ensure that all joints are air-tight.

VENTED (BASS REFLEX) ENCLOSURES

Vented enclosures are not air-tight and incorporate an additional opening known as a port or vent, which is generally fabricated from either plastic or cardboard tubing. The port augments the sound coming out of the woofer and is in most cases capable of going lower in frequency than the same woofer in a sealed box. Even though vented enclosures are not air-tight, you should follow the same procedure as with sealed boxes and glue and screw together all joints.

-4- EXTREME DUTY SUBWOOFERS & MIDBASS



CONSTRUCTION AND INSTALLATION

The Table in page 6 gives the internal volume (Vb) in liters and cubic feet for sealed and vented enclosures, each specifically designed for the **EXTREME DUTY SUBWOOFERS**. For sealed enclosures there are options for normal and for “enhanced” bass response (note: the normal response enclosure provides more accurate bass while the smaller “enhanced” bass enclosures are somewhat less accurate, but have marginally increased power handling). Intermediate volumes to those shown on the table may also be used, with corresponding results between a normal response and one with enhanced bass response. For vented enclosures there are two options for normal and “enhanced” bass response, but in this case, rather than changing the volume of the enclosure, a different tuning (vent length) is used.

The dimensions shown in the tables are intended as a guideline and specific dimensions (HxWxD) may be changed provided the internal volume of the enclosure is maintained. Please note that the internal volumes shown in the table already take in account volume occupied by driver and port. For best performance the walls of the enclosure should be rigid and not vibrate as a result of the internal pressures generated by the loudspeakers. **BRAVOX** recommends constructing enclosures from medium-density fiberboard (MDF) with a minimum thickness of 3/4”. For larger 12” and 15” subwoofers it is desirable to use 1” thick MDF. In larger enclosures over 1 cubic foot, internal bracing that joins opposite walls can be incorporated and the final enclosure should be as rigid as possible. All joints should be glued and fastened with screws.

Additionally, internal joints can be covered with a small bead of silicone adhesive to ensure that the enclosure is completely air-tight.

EXTREME DUTY SUBWOOFERS are all moderately heavy for their size and should be fastened to the enclosure with self-threading screws with adequate length and diameter, utilizing all the mounting holes in the frame. To avoid air leakage, a foam rubber gasket or similar sealing method should be applied between the loudspeaker and the enclosure. The external surface of the enclosure may be painted or fabric-covered, to suit the consumer.

Since low frequency sounds are not directional, subwoofer enclosures can generally be placed anywhere within the car, without compromising stereo imaging. While the trunk is the most obvious location, locating them behind the seats is another possibility. However, different placement locations of subwoofer enclosures can sometimes influence the overall quality of bass/midbass response. As interior acoustics are different for each vehicle, you may wish to experiment with various mounting locations before permanently mounting the woofer.

-5- EXTREME DUTY SUBWOOFERS & MIDBASS

