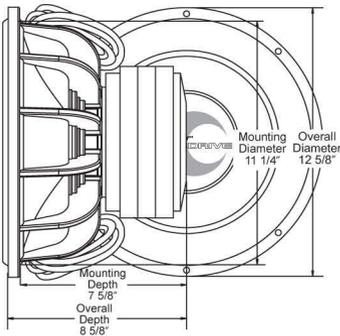


Lanzar® OPTIDRIVE

SPECIFICATIONS

Lanzar® Opti-Series

Woofer for small enclosures



Performance Parameters	OPTI1233D		Physical & Installation Parameters	
Power (Watts RMS)	3000W	3000W	Voice	3" BACCAR
Power (Watts Peak)	6000W	6000W	Magnet	125oz x 3
Individual Impedance	1.3 ohm	1.3 ohm	Cone	Black Laminated Pulp
Nom. Impedance	1 ohm	3 ohm	Surround	Foam
Re (ohms)	0.65	2.6	Spider	Polyester Cotton Composite
Fs (Hz)	52	52	Dustcap	Mica
Qms	4.251	4.969	Frame	Cast Aluminum
Qes	0.908	0.966	Terminals	Direct Connect 8 Gauge Wire
Qts	0.748	0.809		
X-Max(mm)	15.5	15.5		
Vas(cu. ft.)	0.531	0.533		

Lanzar continually strives to improve the performance and value of its products. All specifications are subject to change.

Suggested enclosure parameters

speaker model		Sealed 		Vented 	
		Small	Large	Small	Large
OPTI 1233D	Enclosure volume, cu. ft. Sealed or vented	1.0	NA	1.5	1.8
	Vent length, inches			10	10
	Vent diameter, inches			5	5
	Enclosure Frequency, Hz	64			
	Fb Tuning Frequency of the Vented Enclosure	NA		45.83	41.84
	F3 Systems 3dB Down Piont (Sealed)	52			

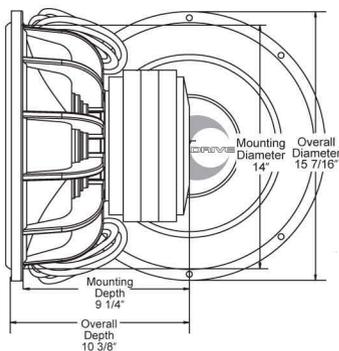
Lanzar® OPTIDRIVE

SPECIFICATIONS

Lanzar® Opti – Series

Woofer for small enclosures

Performance Parameters	OPTI1533D		Physical & Installation Parameters	
Power (Watts RMS)	3000W	3000W	Voice	3" BACCAR
Power (Watts Peak)	6000W	6000W	Magnet	125oz x 3
Individual Impedance	1.3 ohm	1.3 ohm	Cone	Black Laminated Pulp
Nom. Impedance	1 ohm	3 ohm	Surround	Foam
Re (ohms)	0.65	2.6	Spider	Polyester Cotton Composite
Fs (Hz)	50	50	Dustcap	Mica
Qms	5.803	6.586	Frame	Cast Aluminum
Qes	1.44	1.44	Terminals	Direct Connect & Gauge Wire
Qts	1.154	1.182		
X-Max (mm)	13	13		
Vas (cu. ft.)	1.083	1.072		



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Suggested enclosure parameters

speaker model		Sealed 		Vented 	
		Small	Large	Small	Large
OPTI 1533D	Enclosure volume, cu. ft. Sealed or vented	2.0		2.0	3.0
	Vent length, inches			8	8
	Vent diameter, inches			5	5
	Enclosure Frequency, Hz	62			
	Fb Tuning Frequency of the Vented Enclosure			42.31	35.55
	F3 Systems 3dB Down Piont (Sealed)	45			

Lanzar® Opti SERIES Woofer Specifications

choose this type of enclosure for:

- Increased bass response
- Enhanced efficiency
- Tuneable enclosure

VENTED ENCLOSURES

Vented enclosures, also known as "bass reflex" or "ported enclosures," utilize a tuned vent, called a "duct" or "port." This vent captures the energy of the woofer's backwave to increase bass response and efficiency. The tuning frequency of the enclosure can be altered by changing either the size or the length of the vent. This means that the user can modify the bass output without changing the enclosure. Because the port supplies a portion of the bass to the listener, the port and the speaker must both vent into the vehicle's interior. Here are some general guidelines for utilizing vents on your enclosure:

- Vents can be of any shape. Use a material that is easy to work with when constructing the ducts. Cardboard mailing tubes or PVC pipe work well as port tubes. Remember to keep the port opening, inside and outside of the enclosure, free of obstructions for a distance equal to or greater than the port diameter.
- Typically, the larger the vent, the less duct noise created from the air being moved in and out. As the vent gets larger in diameter, the same tuning frequency can only be maintained by extending the length of the duct. The duct may extend beyond the outside of the enclosure or bend internally in order to achieve the desired length. Ultimately, the limitations of the size and length of the duct will be determined by the physical dimensions of the enclosure and installation area.
- When installing vents in the enclosure, try to keep the vent at least one vent diameter from any wall and at least two vent diameters from the woofer. There are pressure differences that exist surrounding the woofer and in proximity to the enclosure wall that can keep the vent from performing as designed.
- Because of lack of space in the enclosure, reducing the size of the vent or allowing the duct to protrude out of the enclosure are options that the occasional installation may require. Another method to get a duct to fit in an enclosure would be to use PVC pipe for the duct and a PVC elbow to create a bend in the duct. The length of the duct should be measured at its center to determine the length.

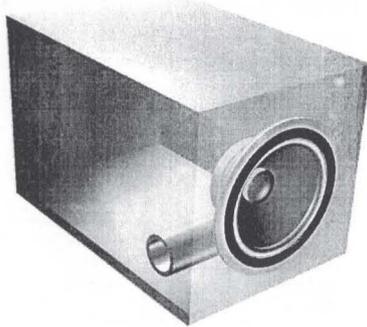


FIG 2: Example of a vented enclosure

choose this type of enclosure for:

BandPASS ENCLOSURES

- Control of both low end response and high end cutoff
- Increased efficiency and lower distortion
- Can eliminate need for crossovers or electronics in signal path

Bandpass enclosures can be constructed in many different configurations. Often referred to as 4th, 5th, 6th, 7th, or 8th order enclosures, these enclosures are named based on the sum of their highpass and lowpass orders. The common characteristics between all bandpass enclosures is that one can control both the low end response and the high end cutoff. This capability allows the user tremendous flexibility when tailoring a sound system to a particular vehicle.

Another benefit of the bandpass enclosure can be increased efficiency. Typical passband efficiency gains are in the 3db range, but gains over twice that amount can be achieved in some configurations. Lower distortion is also attainable because bandpass systems can integrate their own acoustic low pass filter, making it possible to eliminate low end passive inductors or electronic crossovers from the signal path.

Yet another benefit in bandpass enclosures is ease of installation. With a bandpass enclosure, all of the sound is delivered through a vent (s). This can be a big help in dealing with space limitations by only requiring enough area to vent the enclosure into the vehicle, not the entire woofer opening.

Critics of bandpass enclosures feel that because all of the sound is delivered through a vent, sound quality may suffer (when compared to other direct firing enclosures). A consideration when contemplating using a bandpass enclosure is the complexity of the enclosure. The box is more difficult to build and accessibility to the woofer for servicing is limited.

In a 4th order bandpass enclosure (12db slope for highpass and lowpass), the woofer low frequency tuning is determined by the volume of the rear sealed enclosure. The vent determines the frequency for the acoustic low pass filter, while the volume of the front compartment determines the response curve in the passband. The greater the volume of the front compartment the greater is the rise in the mid passband. Conversely, the smaller the front compartment the greater is the dip. By adding a series inductor to a 4th order bandpass enclosure it becomes a 5th order enclosure with a 18db lowpass rolloff.

A 6th order bandpass (or "dual vented") bandpass enclosure will have a rear chamber vent. This enclosure works similarly to a 4th order enclosure, with the efficiency and low frequency control of a vented system added. Similarly to other vented enclosures, the enclosure provides little control for the woofer below the tuned frequency of the vent. With both 6th order bandpass or vented enclosures a sub sonic or low frequency filter can aid in reducing inaudible and often excessive cone excursions, thereby minimizing premature driver failure.

All rules applying to building sealed or vented enclosures apply to constructing bandpass enclosures. The enclosures must be sealed, vents must be unobstructed and kept away from enclosure walls.

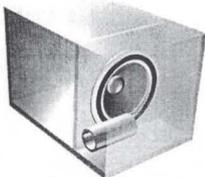


FIG 3: Example of a sealed bandpass enclosure

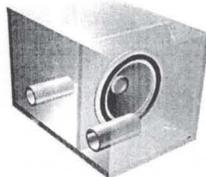


FIG 4: Example of a vented bandpass enclosure

Lanzar Woofer Manual