

C R E S C E N D O

E V O L U T I O N 3 1 2

12 INCH SUBWOOFER

TECHNICAL PAPER

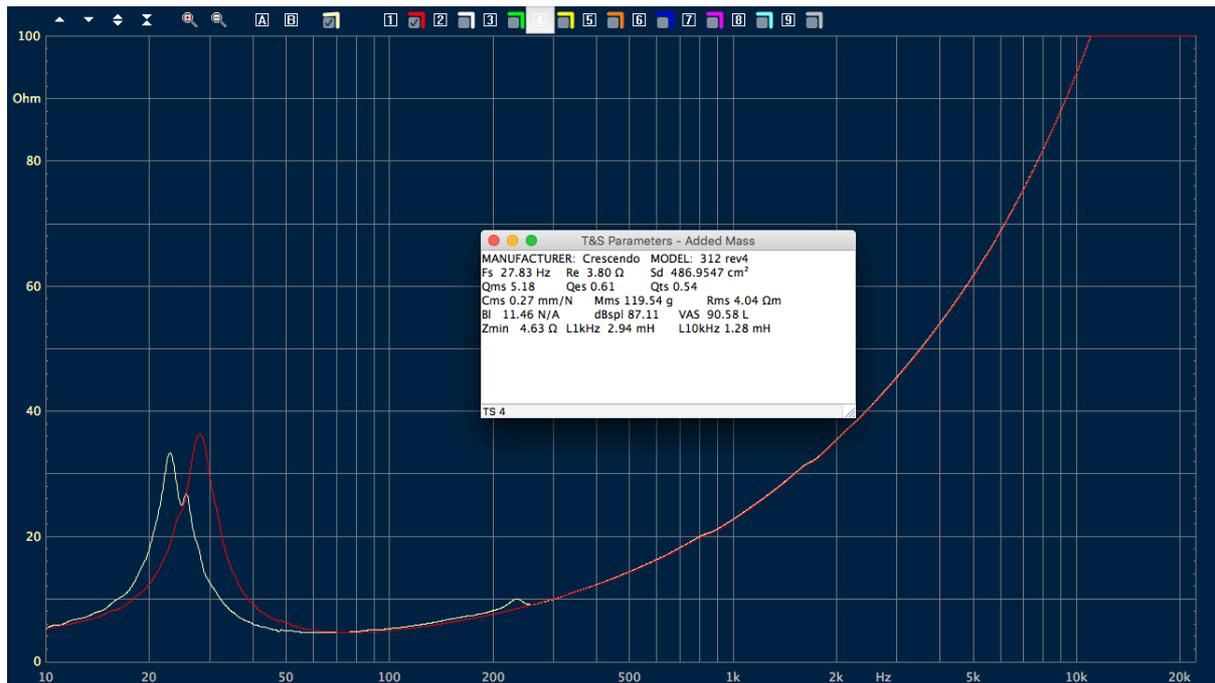
Specification:

- 300 mm (12 inch) outside diameter
- 250 mm (10 inch) cone / piston diameter
- 50 mm (2 inch) 4 layer voice coil
- 150 x 70 mm double magnet
- 4 ohm impedance
- 22 mm linear excursion
- 300 - 500 Watt RMS
- Polypropylene (PP) cone material
- Overhung design for high sensitivity
- Computer aided design to balance excursion vs sensitivity and predict distortion / saturation
- Long excursion suspension means loud and low
- Custom tooling ventilated basket to improve piston area for louder bass
- Ported pole to eliminate distortion (strange sound on bass guitar) and improve piston area
- Aluminum front ring and custom tooling large opening hexagon grill included for cosmetic & protection
- Thiele Small Parameter is optimized for to work best on both sealed or ported box

Thiele Small Parameter:

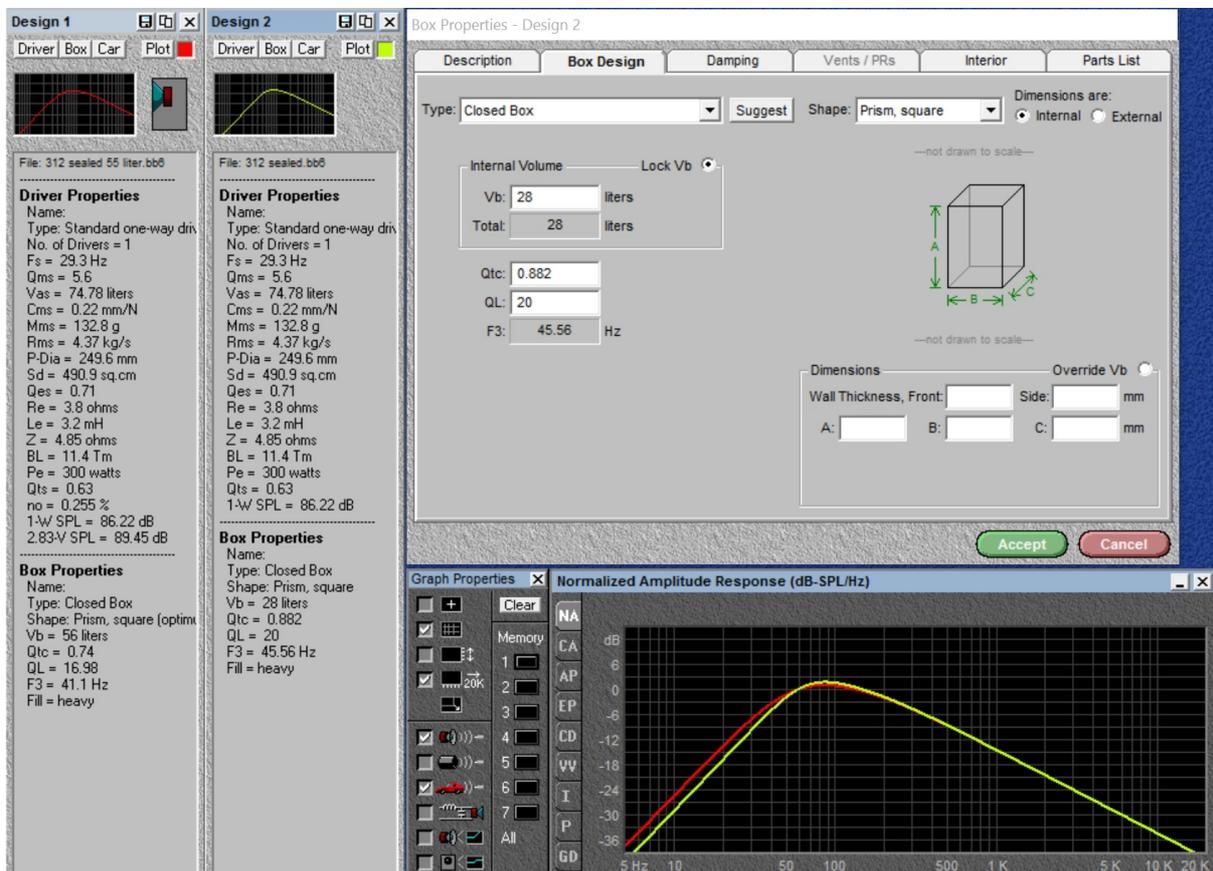
MANUFACTURER: Crescendo MODEL: 312 rev4
Fs 27.83 Hz Re 3.80 Ω Sd 486.9547 cm²
Qms 5.18 Qes 0.61 Qts 0.54
Cms 0.27 mm/N Mms 119.54 g Rms 4.04 Ω m
Bl 11.46 N/A dBspl 87.11 VAS 90.58 L
Zmin 4.63 Ω L1kHz 2.94 mH L10kHz 1.28 mH

Impedance Curve:



Sealed Box:

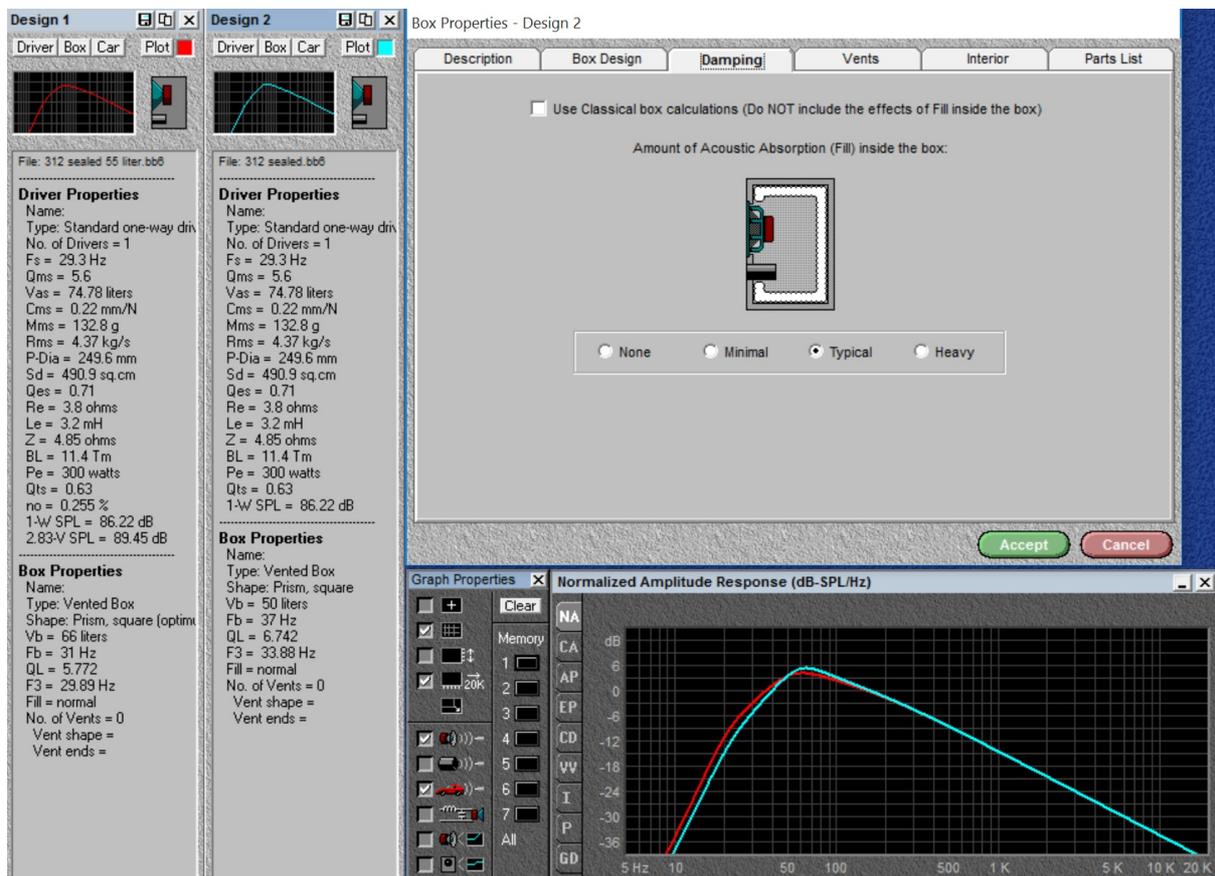
- Sealed box optimum volume is 28 liters (1 cu ft), which is decent for all kind of music.
- Jazz music lover who expect more low bass can increase box volume to 56 liters (2 cu ft) and will receive additional 3 dB more output at 20 Hz (3 dB equals double the amplifier power).
- Please see Picture 1: red curve is Evo 312 in 56 liters sealed box while green curve is Evo 312 in 28 liters sealed box.
- Please see Picture 1: damping should be FULL with dacron but not until DENSE.



Picture 1

Ported Box:

- Ported box optimum volume is 66 liters (2.3 cu ft), which is decent for all kind of music.
- Beat music lover who expect more loudness can reduce box volume to 50 liters (1.8 cu ft) and will receive additional 2 dB kickbass at 63 Hz. Note: 3 db more output is equal to double the amplifier power.
- Please see Picture 2: red curve is Evolution 312 in 66 liters ported box while light blue curve is Evolution 312 in 50 liters ported box.
- Please see Picture 2: damping is only 1 sheet of dacron on each wall and should not cover subwoofer back part and port mouth



Picture 2

Port Calculation for 66 liters ported box:

- Round with 2 flared ends: diameter 100 mm and length 298 mm (below picture)

Description	Box Design	Damping	Vents	Interior	Parts List
<div style="border: 1px solid gray; padding: 10px;"> <p>No. of Vents: <input type="text" value="1"/></p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Vent Cross Section Shape</p> <p><input checked="" type="radio"/> Round </p> <p><input type="radio"/> Rectangle</p> <p><input type="radio"/> Other</p> </div> <div style="width: 45%;"> <p>Vent End Type</p> <p><input type="radio"/> One Flush End</p> <p><input type="radio"/> Two Flush Ends</p> <p><input type="radio"/> No Flush Ends</p> <p><input type="radio"/> One Flared End</p> <p><input checked="" type="radio"/> Two Flared Ends </p> </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 45%;"> <p><input type="button" value="Suggest Minimum Vent Area for Xmax"/></p> <p><input type="checkbox"/> Lock Vent Dimensions Fb = 31 Hz</p> </div> <div style="width: 45%;"> <p>Diameter (Dv): <input type="text" value="100"/> mm</p> <p>Length (Lv): <input type="text" value="298"/> mm</p> <p>QLv: <input type="text"/></p> </div> </div> </div>					

- Round with 1 flared end: diameter 100 mm and length 285 mm (below picture)

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<div style="border: 1px solid gray; padding: 10px;"> <p>No. of Vents: <input type="text" value="1"/></p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Vent Cross Section Shape</p> <p><input checked="" type="radio"/> Round </p> <p><input type="radio"/> Rectangle</p> <p><input type="radio"/> Other</p> </div> <div style="width: 45%;"> <p>Vent End Type</p> <p><input type="radio"/> One Flush End</p> <p><input type="radio"/> Two Flush Ends</p> <p><input type="radio"/> No Flush Ends</p> <p><input checked="" type="radio"/> One Flared End </p> <p><input type="radio"/> Two Flared Ends</p> </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 45%;"> <p><input type="button" value="Suggest Minimum Vent Area for Xmax"/></p> <p><input type="checkbox"/> Lock Vent Dimensions Fb = 31 Hz</p> </div> <div style="width: 45%;"> <p>Diameter (Dv): <input type="text" value="100"/> mm</p> <p>Length (Lv): <input type="text" value="285.3"/> mm</p> <p>QLv: <input type="text"/></p> </div> </div> </div>					

- Rectangle with 1 flared end: opening 40 x 200 mm and length 325 mm (below picture)

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<div style="border: 1px solid gray; padding: 10px;"> <p>No. of Vents: <input type="text" value="1"/></p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Vent Cross Section Shape</p> <p><input type="radio"/> Round</p> <p><input checked="" type="radio"/> Rectangle </p> <p><input type="radio"/> Other</p> </div> <div style="width: 45%;"> <p>Vent End Type</p> <p><input type="radio"/> One Flush End</p> <p><input type="radio"/> Two Flush Ends</p> <p><input type="radio"/> No Flush Ends</p> <p><input checked="" type="radio"/> One Flared End </p> <p><input type="radio"/> Two Flared Ends</p> </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 45%;"> <p><input type="button" value="Suggest Minimum Vent Area for Xmax"/></p> <p><input type="checkbox"/> Lock Vent Dimensions Fb = 31 Hz</p> </div> <div style="width: 45%;"> <p>Height (Hv): <input type="text" value="40"/> mm</p> <p>Width (Wv): <input type="text" value="200"/> mm</p> <p>Length (Lv): <input type="text" value="324.7"/> mm</p> <p>QLv: <input type="text"/></p> </div> </div> </div>					

Port Calculation for 50 liters ported box:

- Round with 2 flared ends: diameter 100 mm and length 271 mm (below picture)

The screenshot shows the 'Vents' tab of a software interface. The 'No. of Vents' is set to 1. Under 'Vent Cross Section Shape', 'Round' is selected. Under 'Vent End Type', 'Two Flared Ends' is selected. The 'Diameter (Dv)' is 100 mm and the 'Length (Lv)' is 270.7 mm. A 'Suggest Minimum Vent Area for Xmax' button is visible, along with a 'Lock Vent Dimensions' checkbox and a frequency value of Fb = 37 Hz.

- Round with 1 flared end: diameter 100 mm and length 258 mm (below picture)

The screenshot shows the 'Vents' tab of a software interface. The 'No. of Vents' is set to 1. Under 'Vent Cross Section Shape', 'Round' is selected. Under 'Vent End Type', 'One Flared End' is selected. The 'Diameter (Dv)' is 100 mm and the 'Length (Lv)' is 258 mm. A 'Suggest Minimum Vent Area for Xmax' button is visible, along with a 'Lock Vent Dimensions' checkbox and a frequency value of Fb = 37 Hz.

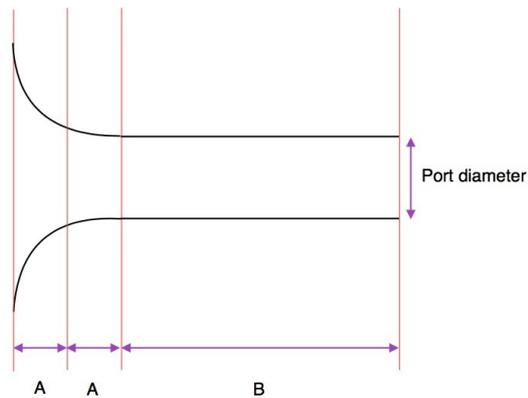
- Rectangle with one flared end: opening 40 x 200 mm and length 297 mm (below picture)

The screenshot shows the 'Vents' tab of a software interface. The 'No. of Vents' is set to 1. Under 'Vent Cross Section Shape', 'Rectangle' is selected. Under 'Vent End Type', 'One Flared End' is selected. The 'Height (Hv)' is 40 mm and the 'Width (Wv)' is 200 mm. The 'Length (Lv)' is 296.8 mm. A 'Suggest Minimum Vent Area for Xmax' button is visible, along with a 'Lock Vent Dimensions' checkbox and a frequency value of Fb = 37 Hz.

Port knowledge:

- Flare is needed to reduce port noise at high volume level.
 - Double flare is the best
 - Single flare is minimum required
 - No flare is not acceptable
- Round port diameter for Evolution 312 is minimum 100 mm (4 inch) and maximum 125 mm (5 inch). Rectangle port is minimum 40 mm x 20p0 mm.
- Measuring port length:
 - Half of the flare length is calculated as port length calculation while the rest is not calculated.

PORT LENGTH CALCULATION FOR AERO PORT



B = normal port length
A = half of aero port length
Port length calculation = B + A