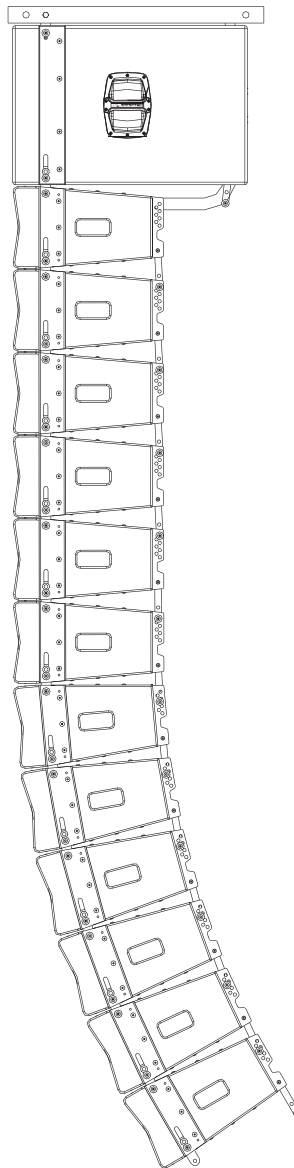
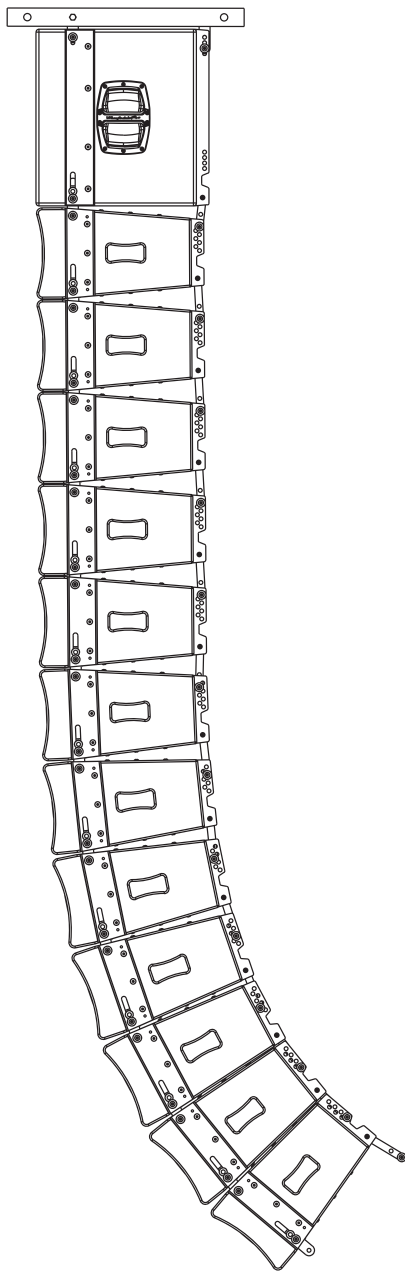




# WLA-28 & WLA-15B WLA-28SUB & WLA-218SUB WLA-218B OPERATING MANUAL AND USER GUIDE

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# IMPORTANT WARNINGS & SAFETY INSTRUCTIONS

- Read these instructions
- Follow these instructions
- Keep these instructions for future reference
- Heed all warnings
- Do not use this system near moisture or water
- Clean only with a dry cloth
- Install in accordance with these Wharfedale Pro operating instructions
- Follow the manufacturer's operating instructions for all peripheral devices such as amplifiers and processors
- Do not install near heat sources such as radiators, heat registers, stoves or any other apparatus that produces heat (for example lighting systems and amplifiers)
- Use only accessories specified or supplied by Wharfedale Pro
- Do not use shielded microphone/instrument cables to connect amplifiers and speakers, use only approved speaker cables with proper connectors
- Use caution with placement and operation of this speaker system, permanent hearing damage can be caused by prolonged exposure to excessive sound pressure levels
- Refer all servicing to qualified professionals. Servicing is required when the loudspeaker has been damaged in any way, such as impact damage, liquid ingress or foreign object damage. In addition the loudspeaker should be referred to qualified service personnel if there is any kind of malfunction.



Rigging, suspending and mounting should only be attempted by experience qualified professionals. Incorrect usage can result in damage to equipment and property, injury and even death. Under no circumstances should you attempt to rig, suspend or mount these speakers unless you are fully qualified and certified to do so by relevant local, state and national authorities. If you are not properly qualified or do not know of pertinent regulations consult qualified personnel for advice. Consult a structural engineer before suspending a speaker system and ensure that the total weight of your system can be held by the truss or mounting surface.



Inspect all mounting hardware before your line array is flown. If there is any damage or distortion to any mounting hardware do not fly the array until any damaged hardware is repaired or replaced. Only use Wharfedale Pro supplied Quick release Pins, contact your Wharfedale Pro Distributor if any quick release pins are lost or damaged.



## INTRODUCTION

Designed for the most demanding concert and installation audio professionals, the WLA-28 system sets new standards for astonishing acoustical performance in a compact size.

Line arrays are increasingly employed in a wider range of venues and applications. Frequently these venues have height or sightline restrictions that limit the placement and size of the array. Rising fuel costs are putting pressure on touring system providers to downsize their transportation requirements. At the same time, client and audience expectations for audio performance has never been higher. To meet these needs, Wharfedale Pro embarked on a program to develop the most compact, highest output line array speaker system available.

Each WLA-28 element uses a pair of high-power, 8" low-frequency drivers. Both cover low frequencies while only one extends into the mid range, thus maintaining horizontal dispersion control at a crossover. High frequencies are handled by a premium 3.2" diaphragm, neodymium compression driver, 100° x 10° multiple aperture diffraction waveguide. This creates a wide coverage with a superb stereo image and allows for more diverse placement.

The waveguide exit extends nearly to the top and bottom of the enclosure to create a continuous acoustical source with minimal discontinuities between adjacent elements resulting in greatly reduced destructive interaction.

Premium materials are used throughout the system. The enclosure is constructed of Baltic birch plywood and coated in an environmentally friendly, waterborne polymer finish that is field repairable. To keep the weight to a minimum and prevent rust, suspension fittings are made of aluminium.

An elegantly simple 4-point suspension system combined with light weight, compact size and excellent handling ergonomics mean that a one person crew can easily deploy an array. A single WLA-28 array fly frame suspends up to twelve line array elements or up to twelve line array elements plus one subwoofer. The WLA-28 system is equally at home in the air or ground-stacked.



# FEATURES

## WLA-28

- High sensitivity, Full Horn Loaded design
- 400W RMS/ 800W Program / 1600W Peak Power Handling
- Dual 8" woofer, 2.0" voice coils
- 1 x 1.4" exit HF compression driver
- 3.2" Titanium diaphragm, neodymium magnet compression driver
- 100° x 10° degree constant-directivity horn
- Nominal Impedance 16 Ohm
- Internal Passive Crossover Network
- External Crossover Bypass Switching
- Easily configured for full-range or bi-amp amplification
- Front hinged rigging system
- Captive rigging hardware with tethered quick release pins
- Comprehensive adjustable splay angles
- Integral, side plate adjustable rigging system, vertical splay adjustable in 1° increments from 0°-10°
- Trapezoid Baltic birch plywood enclosure
- 2 x Parallel Speakon Inputs
- Constant directivity waveguides

## WLA-15B

- 700W RMS / 1400W Program / 2800W Peak power handling
- Road tough modular subwoofer system
- Wharfedale Pro 15" cast frame woofer handling high power and long throw
- 4" voice coil woofer
- Nominal Impedance 8 Ohm
- High-voltage capacitors and inductors with heavy gauge wire enable crossover to deal with high power
- Strong internal bracing prevents bass loss and distortion from enclosure, vibration and resonance
- 2 x Parallel Speakon Inputs
- Durable paint finish

# FEATURES

## WLA-28SUB

- 1200W RMS/2400W Program/4800W Peak power handling
- Road tough modular subwoofer system
- Dual 15" woofers, 4.0" voice coils
- Nominal Impedance 4 Ohm
- Strong internal bracing prevents bass loss and distortion from enclosure vibration and resonance
- 2 x Parallel Speakon Inputs
- Durable black paint finish

## WLA-218SUB

- 1600W RMS/3200W Program/6400w Peak power handling
- High output subwoofer system
- Dual Wharfedale Pro 18" cast frames with high power handling
- long throw 4" voice coil woofers
- Strong internal bracing prevents bass loss and distortion from enclosure vibration and resonance
- Specially designed dual chamber enclosure allowing for use of single or dual amplifier channels via recessed switch on the connector plate
- 4ohm parallel, single channel or discrete 8 ohm dual channel configurations available
- Durable Black paint finish .
- 18mm Plywood construction

## WLA--218B

- 2000W RMS/4000W Program/8000w Peak power handling
- High output sub woofer system
- Dual 18" cast frames with high power handling
- long throw 4" voice coil woofers
- Strong internal bracing prevents bass loss and distortion from enclosure vibration and resonance
- 4ohm parallel.
- 2 x Parallel Speakon Inputs
- Black rhino paint finish .
- 18mm Plywood construction



## SPLAY ANGLES

The WLA can be configured with several different splay angles. The splay angles determine the amount of overlap between the individual units. This is used to determine the amount of summation or 'throw' for separate sections of the array. As the splay angle between boxes increases the summation decreases but the spectral variance due to interactions between the elements is also decreased.

For many venues a good compromise between throw and spectral variance can be reached by varying the splay angle across the length of the array. By varying the angular separation along the length of the array, a balance can be met for the required coverage. Smaller splay angles provide higher summation to cover more distant seating and bleachers. Larger splay angles provide lower summation with reduced spectral variance for close seating. Used correctly this can provide even coverage over long distances.

Each group of loudspeakers with different splay angle will require a separate channel of amplification and different EQ settings. This is due to the different summation effects by differing splay angles.

## LEVEL TAPERING

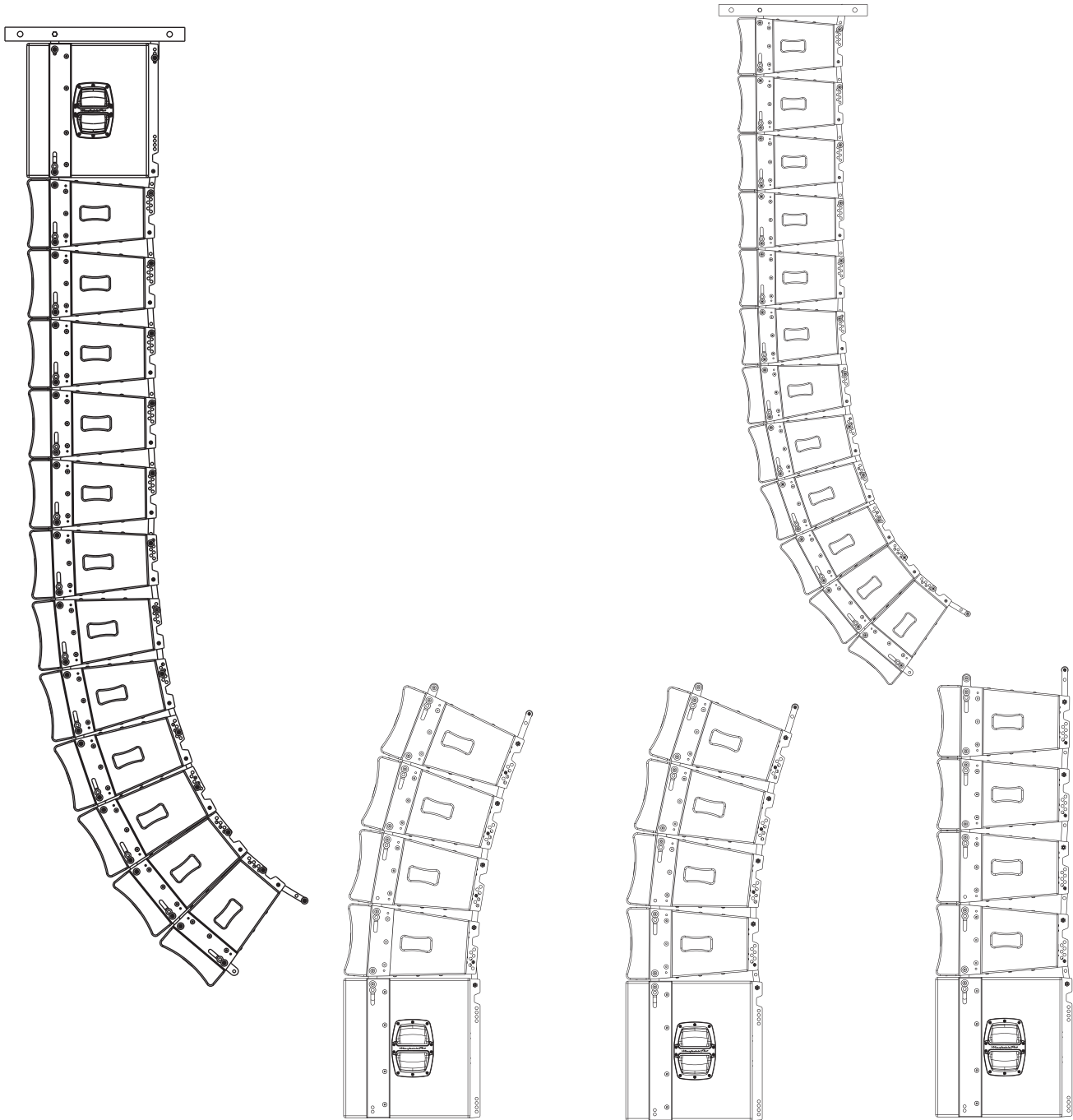
Tapering the level of enclosures has a beam steering effect which can be used in conjunction with angular separation between elements. The beam will be steered away from the 'on-axis' centre line of the array toward the cabs being driven at the highest level. The extent of the beam steering effect depends on the length of the array and the level difference between the top and the bottom of the array. This technique allows you to further tailor the vertical coverage to differently shaped venues, reducing the level variance between the front and rear of the venue.

Ideally the level of each enclosure is tapered gradually (e.g. 0.5dB or 1dB per element). This means you will require an amplifier channel per element in passive mode, or two amplifier channels per element in bi-amp mode. Groups of elements can be tapered in pairs or more, although a more gradual taper will give you smoother vertical pattern control.



# WLA-28 & WLA-15B FLEXIBLE ARRAYS

Arrays can be assembled using only WLA-28 line array modules or with WLA-15B subwoofers at the top of the array. The WLA-28 Fly Frame can be used to assemble arrays of up to 12 x WLA-28 modules alone.



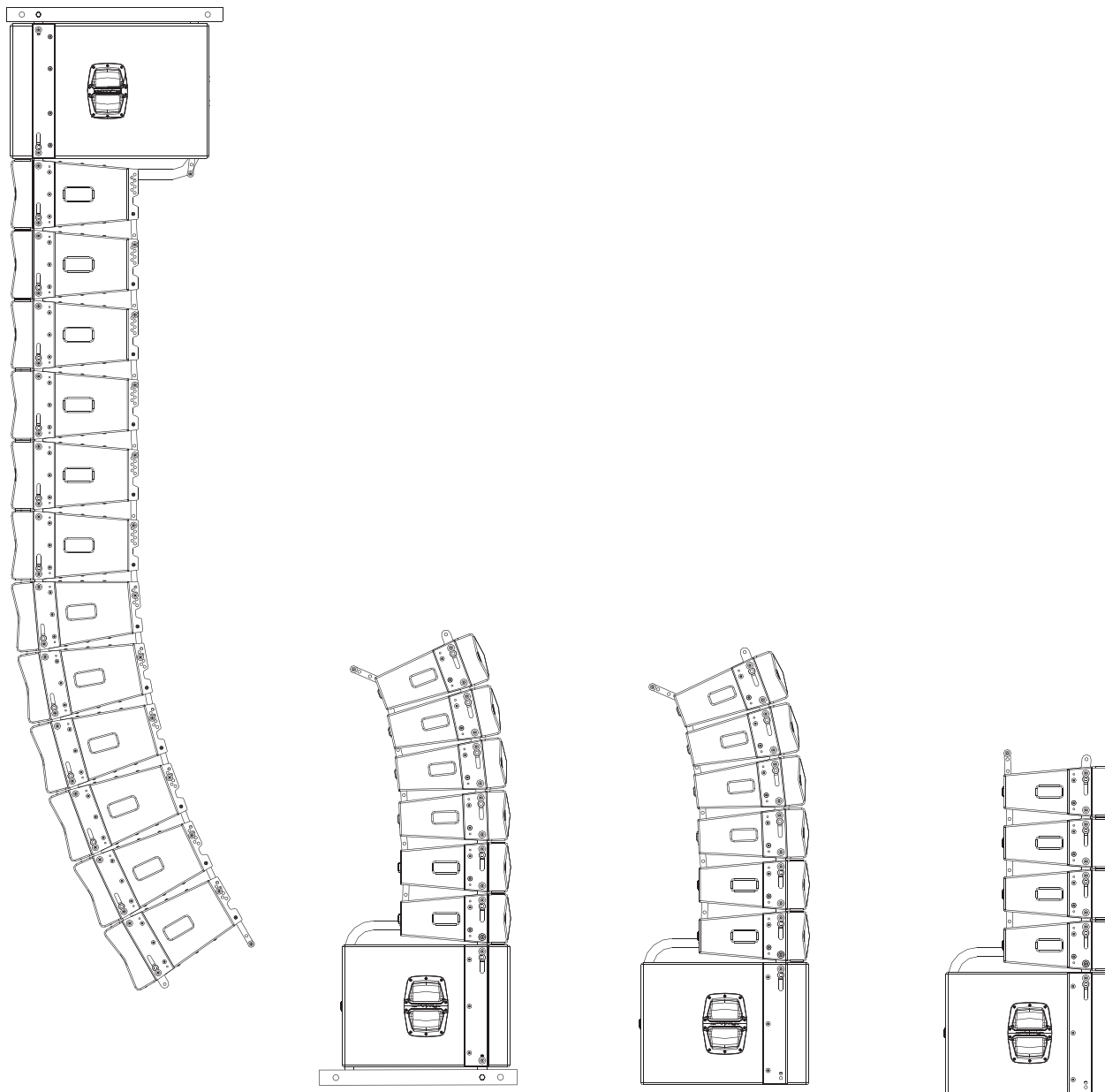
## OPTIMISED GROUND STACKING

WLA-28 rigging doubles up as an optimised ground stacking system, using the WLA-15B subwoofer as a base. Arrays of WLA-28 line array elements can be aimed downwards by as much as 10° to cover audience areas close to a stage, as well as upward by as much as 10° in order to better cover distant balcony seating areas.



# WLA-28 & WLA-28SUB FLEXIBLE ARRAYS

Arrays can be assembled using only WLA-28 line array modules or with WLA-28SUB subwoofers at the top of the array. The WLA-28SUB Fly Frame can be used to assemble arrays of up to 12 x WLA-28 modules and a WLA-28SUB.



## OPTIMISED GROUND STACKING

WLA-28 rigging doubles up as an optimised ground stacking system, using the WLA-28SUB subwoofer as a base. Arrays of WLA-28 line array elements can be aimed downwards by as much as 10° to cover audience areas close to a stage, as well as upward by as much as 10° in order to better cover distant balcony seating areas.



## AIR ABSORPTION

The high frequency performance of the medium and long throw sections of the line array will be limited by air absorption. As the distance from the source increases, the mid and high frequencies will be reduced. The amount of absorption at a given frequency is function of pressure, temperature and relative humidity. By far the most important factor is the relative humidity, although temperature does have a significant effect.

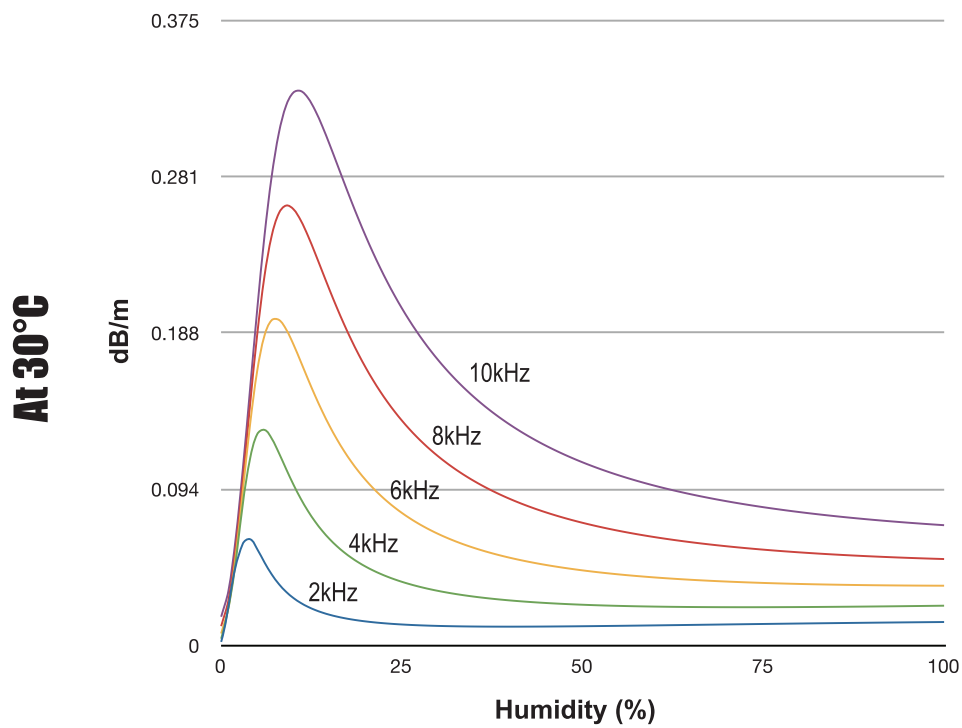
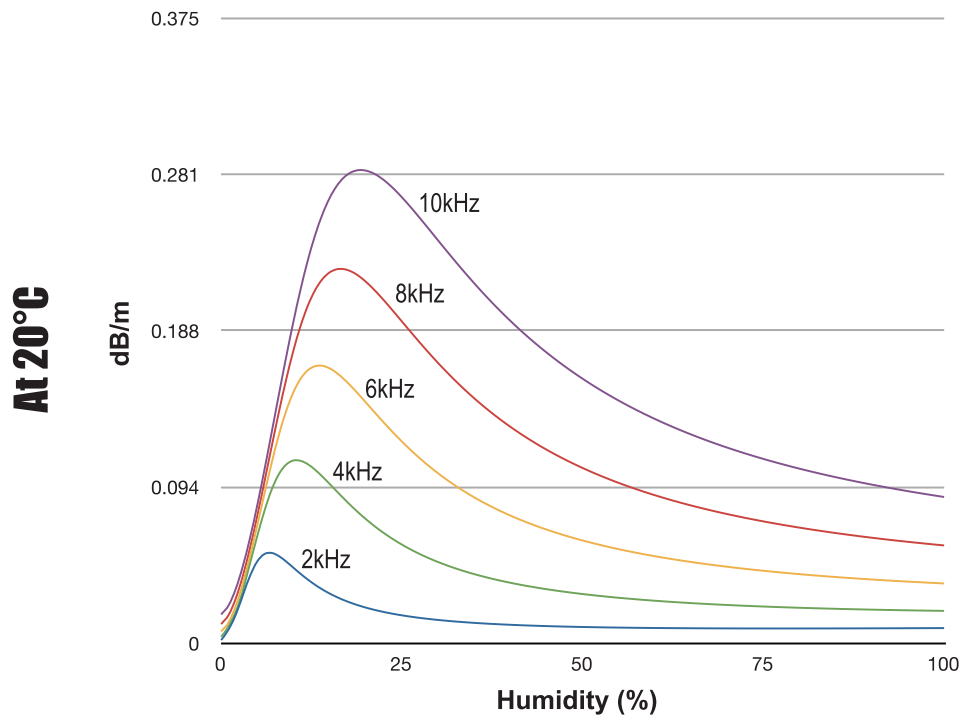
To achieve minimal spectral variance across the coverage of the array, the groups of loudspeakers covering the middle to rear of the venue will require equalization to compensate for this effect. Air absorption is difficult to predict with any great accuracy, and in any case the relative humidity of the venue is likely to change when the audience arrive or the weather changes. It is important that the venue is monitored during the event as the equalization applied during the design stage with an empty venue may not be suitable during the event.

As a general guide, boost above 8kHz for a long throw group of loudspeakers and 12kHz for a medium throw group of loudspeakers.

The chart overleaf shows attenuation in dB/m for a given frequency and humidity. It is important to note that the effects of air attenuation are linear, unlike the level of attenuation from distance from the inverse square law. For example, at 100m a source would be 40dB down compared to it's SPL at 1m. Assuming 50% relative humidity and 20° the level at 10kHz will be an additional 16dB below this (approximately 56dB down).



# AIR ABSORPTION

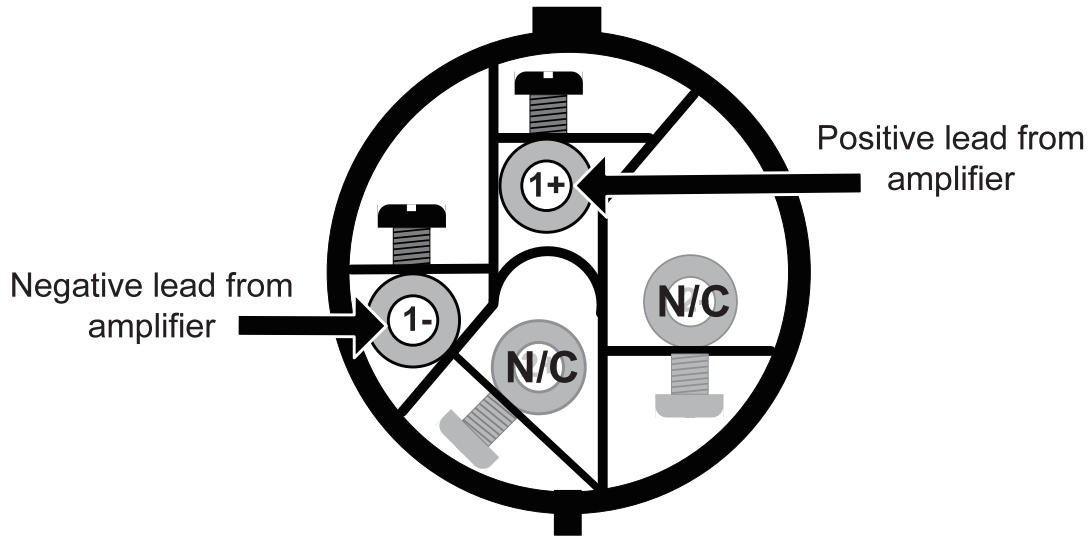


A switch on the WLA-28 input panels selects between either of two operating modes: Passive mode (single amplifier) or Biamp mode (separate low and high frequency amplifiers). In passive mode, the internal crossovers of the WLA-28 loudspeakers divide the audio signal into the separate frequency ranges for each driver. In Bi amp mode one amplifier is used to power the low frequency drivers and another is used for the high frequency section.

The LMX-204 is ideal for WLA-28 passive mode operation and for adding a WLA-15B&WLA-28SUB subwoofer. The Wharfedale Pro Versadrive Series provides control for Bi Amp use. Both controllers provide optimum equalization, filtering and driver protection for all the WLA series loudspeakers.

The WLA-15B, WLA-28SUB, WLA-218B, WLA-218SUB subwoofers do not have internal crossovers. This function must be supplied by external electronic devices such as the Wharfedale Pro Versadrive Series or LMX-204.

# PASSIVE MODE



**LINE ARRAY WLA-28**

**BI-AMP**  
±1 LF: 16Ω  
±2 HF: 8Ω

**BI-AMP**

**PASSIVE**

400 WATTS CONTINUOUS  
800 WATTS PROGRAM

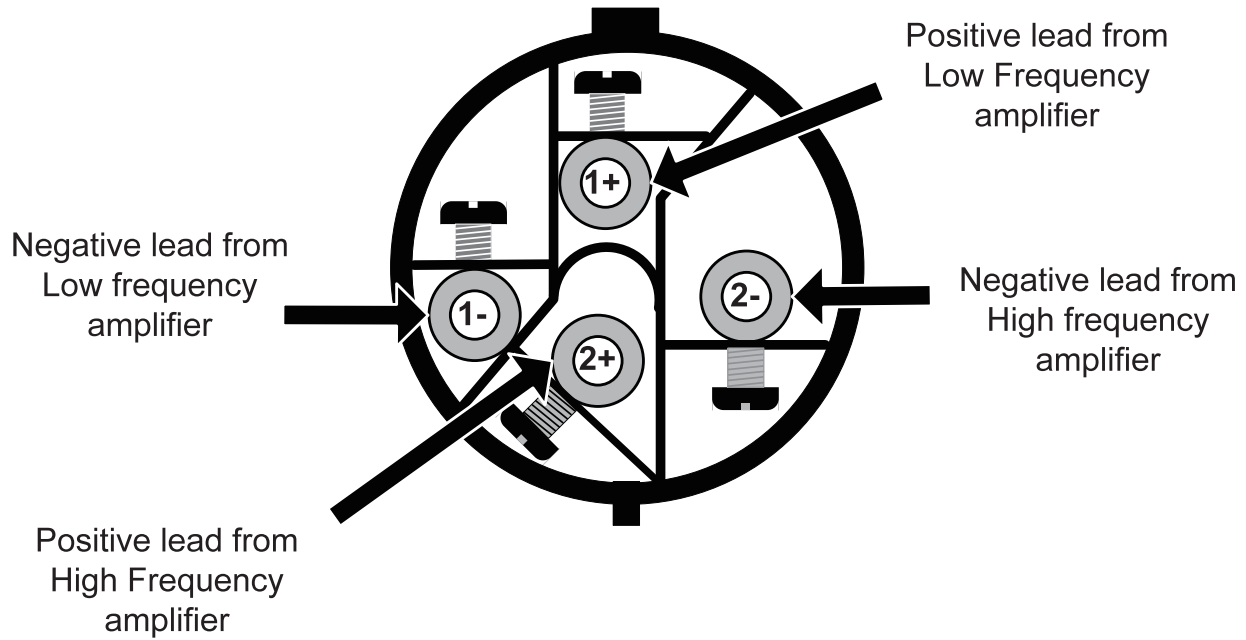
*Wharfedale Pro*

**CE**  
Made in China

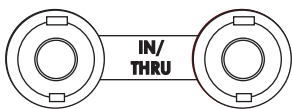
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# BI-AMP MODE




**LINE ARRAY WLA-28**



**BI-AMP**  
±1 LF: 16Ω  
±2 HF: 8Ω


**PASSIVE**  
±1 IN: 16Ω  
±2 N/C

**BI-AMP**



**PASSIVE**

400 WATTS CONTINUOUS  
800 WATTS PROGRAM



CE

Made In China

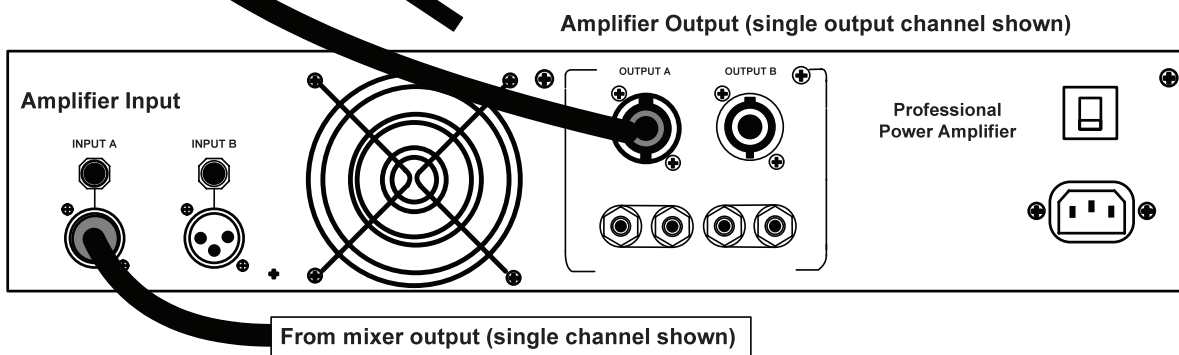
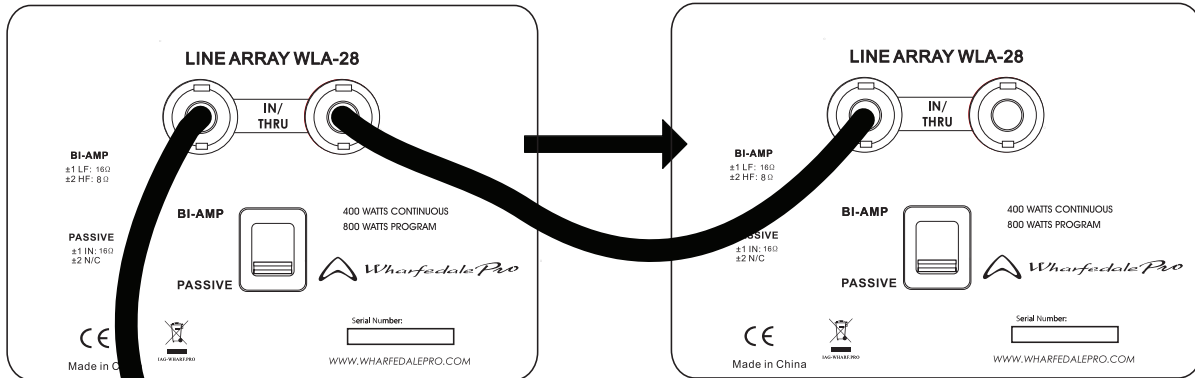
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# PARALLEL WIRING

Enclosure#1

Enclosure#2



## WLA-28&WLA-28SUB Fly Frames

The WLA-28 and WLA-28SUB fly frame is certified to hold a total weight (including third party hardware) of 450kg. Up to 12 WLA-28 and 1 WLA-15B elements can be flown with a safety factor of 12.

Only use the Wharfedale Pro WLA-28 Fly Frame. Ensure that only rated, certified hardware such as tumbuckles, shackles and chains are used.

The WLA-28 and WLA-28SUB fly frame is certified to hold a total weight (including third party hardware) of 450kg. Up to 12 WLA-28 and 1 WLA-28SUB elements can be flown with a safety factor of 12.

Ensure that all truss, structures and flying hardware are capable of suspending the entire array, plus flying hardware, to a suitable safety factor.



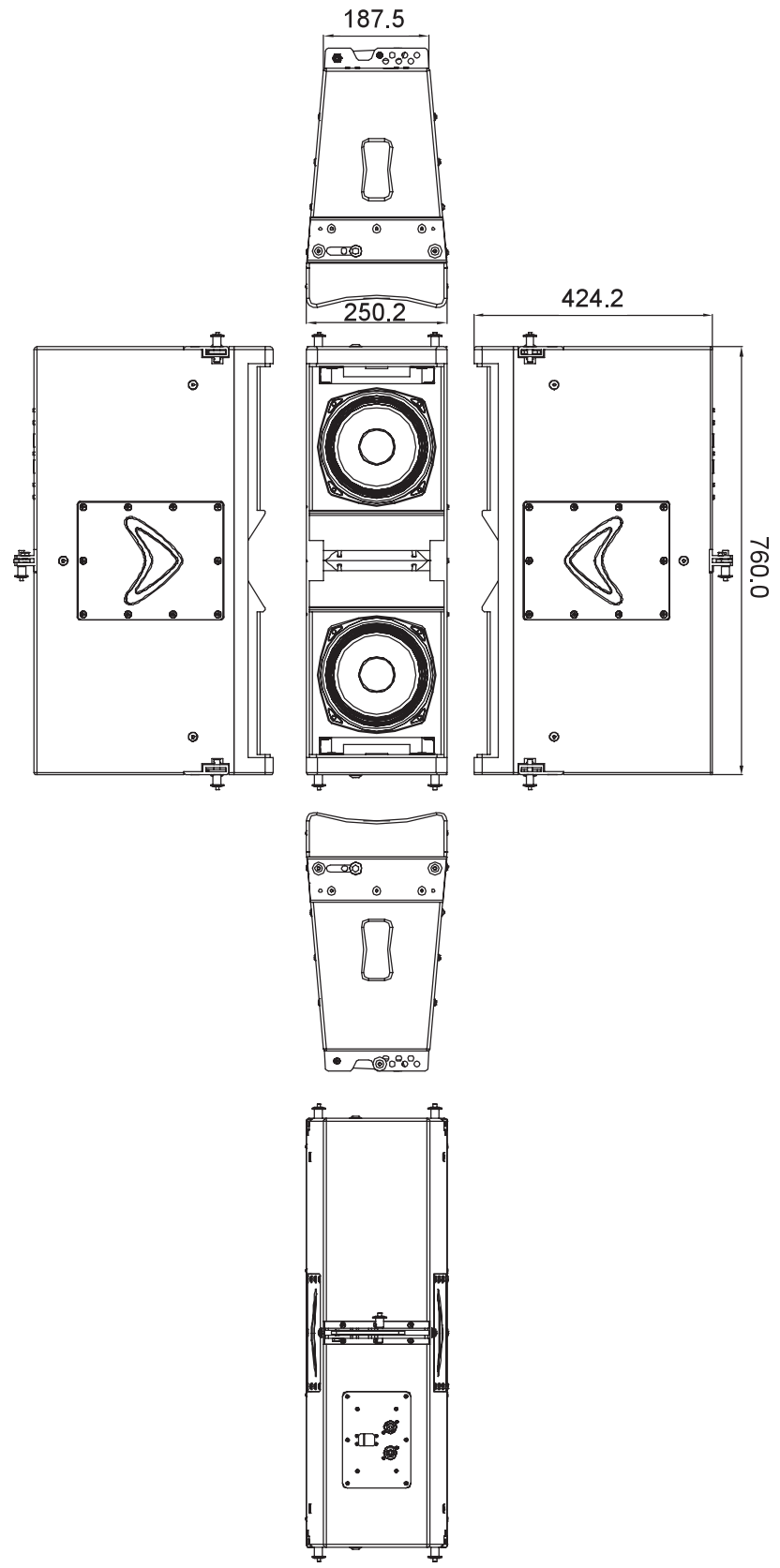
Rigging, suspending and mounting should only be attempted by experienced qualified professionals. Incorrect usage can result in damage to equipment and property, injury and even death. Under no circumstances should you attempt to rig, suspend or mount these speakers unless you are fully qualified or do not know of pertinent regulations consult qualified personnel for advice. Consult a structural engineer before suspending a speaker system and ensure that the total weight of your system can be held by the truss or mounting surface.



Inspect all mounting hardware before your line array is flown. If there is any damage or distortion to any mounting hardware do not fly the array until any damaged hardware is repaired or replaced. Only use Wharfedale Pro supplied quick release pins and contact your Wharfedale Pro distributor if any quick release pins are lost or damaged.



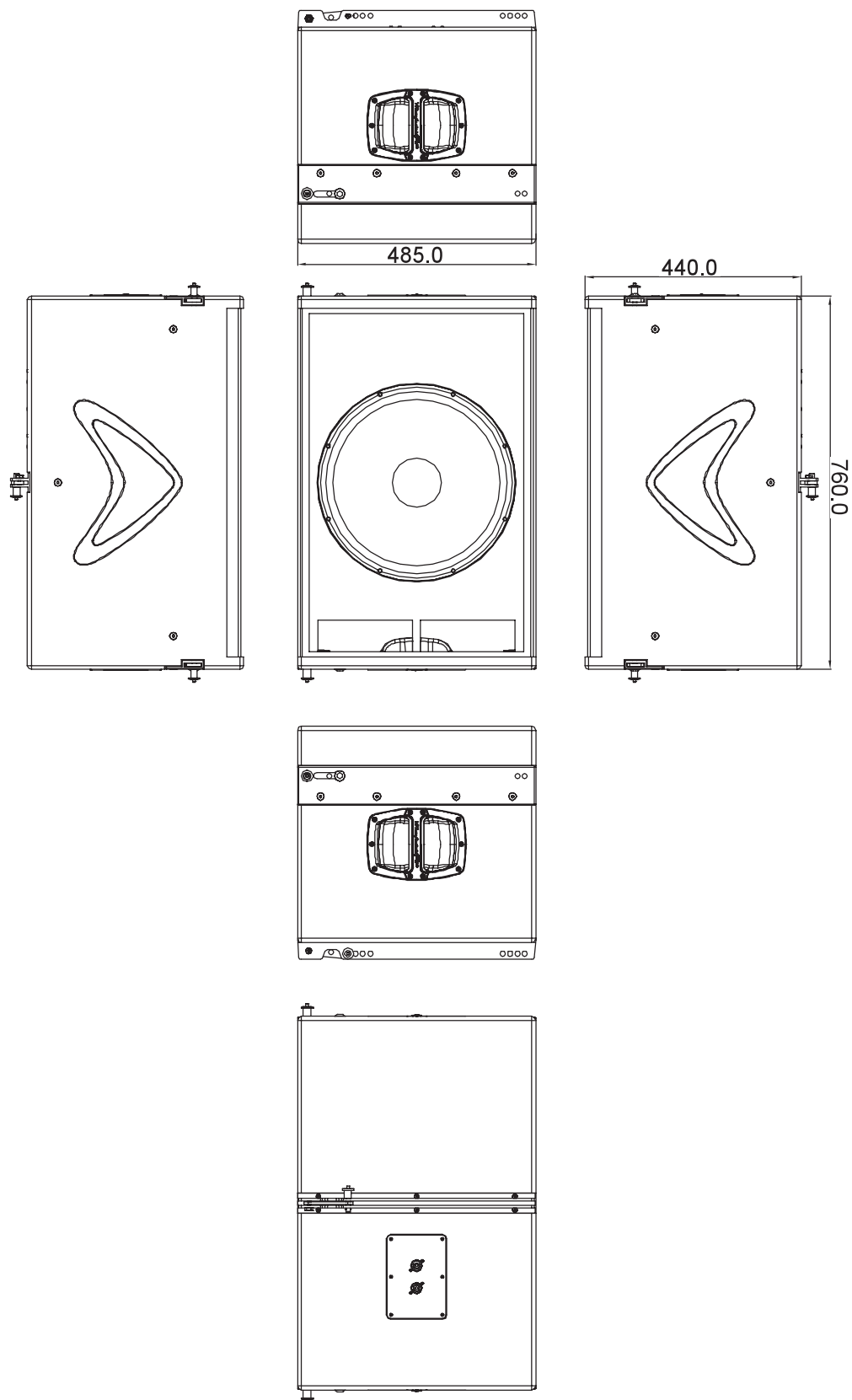
# DIMENSIONAL DRAWINGS-WLA-28





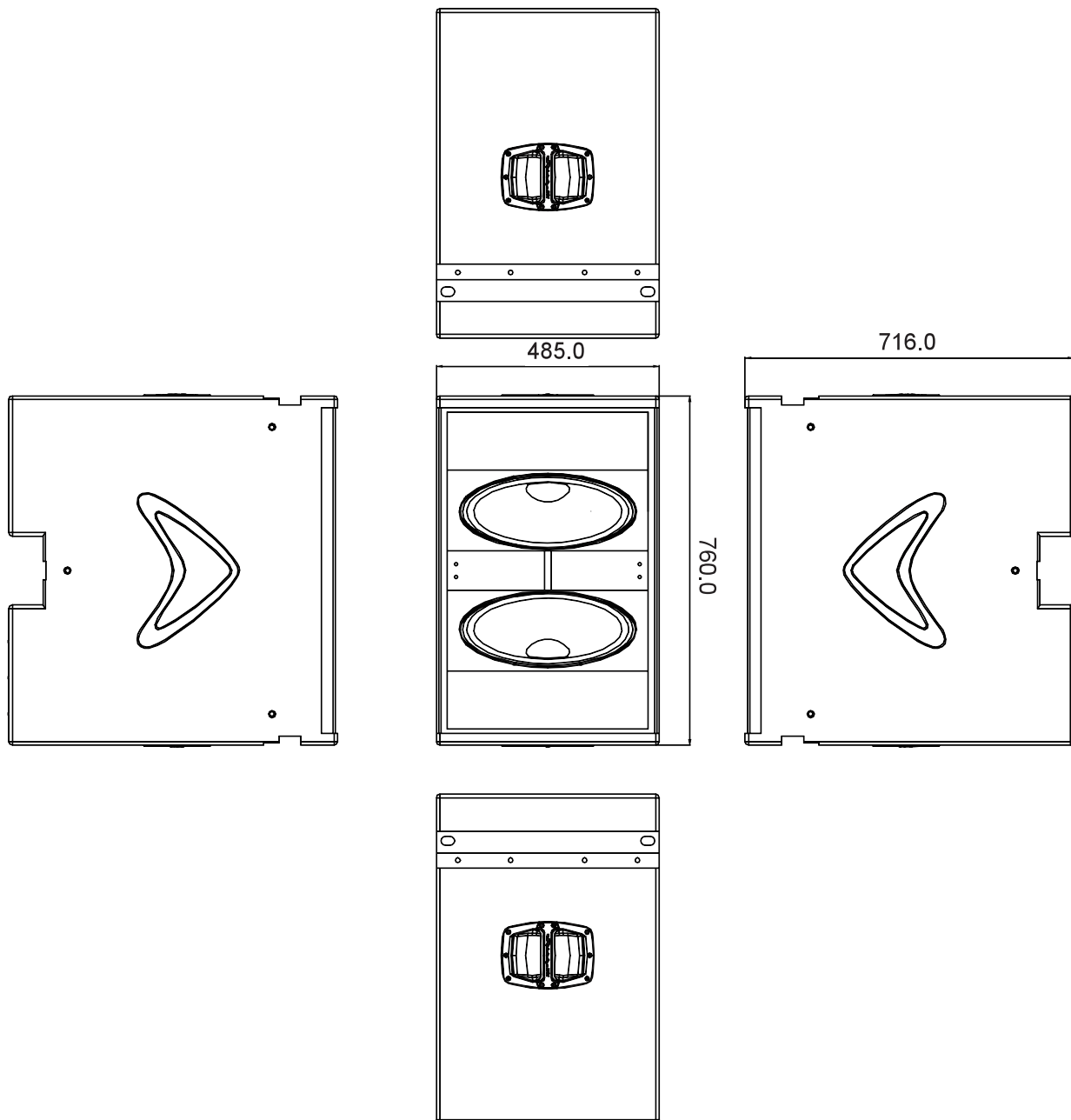


# DIMENSIONAL DRAWINGS-WLA-15B



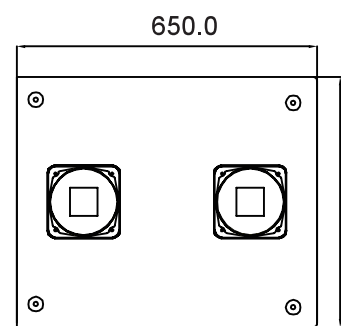
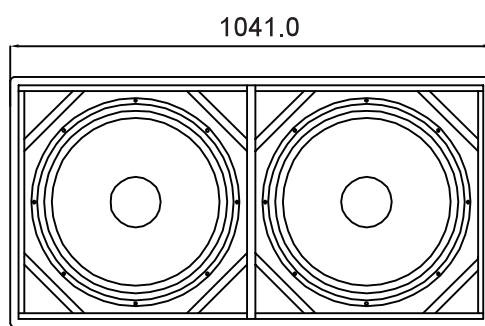
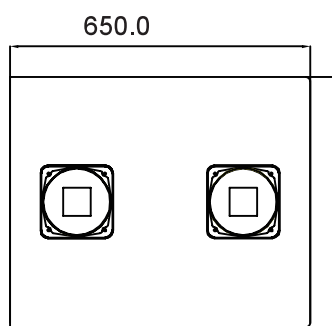
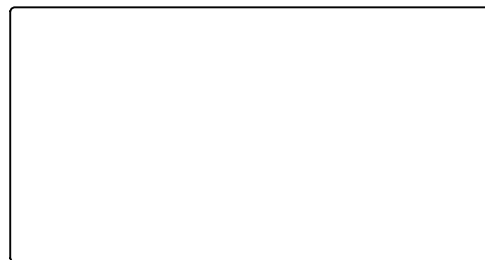
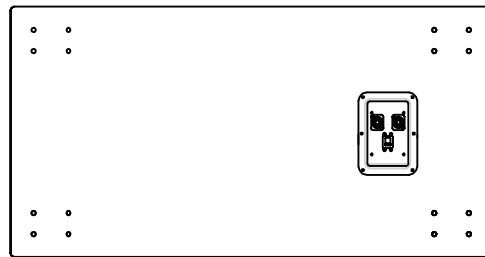


# DIMENSIONAL DRAWINGS-WLA-28 SUB



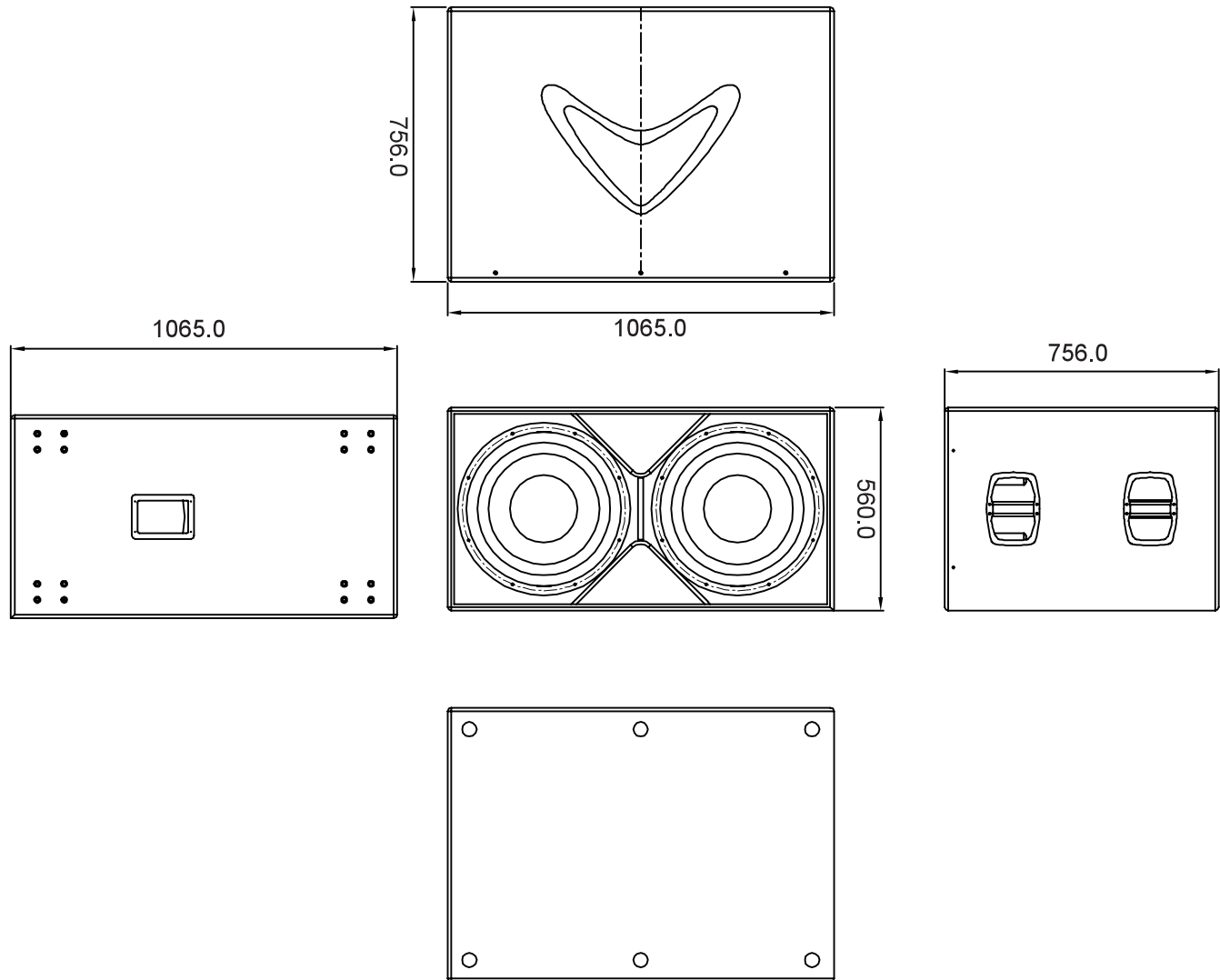


# DIMENSIONAL DRAWINGS-WLA-218 SUB



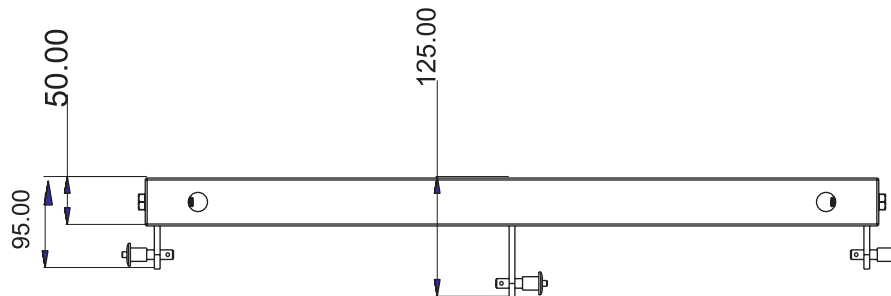
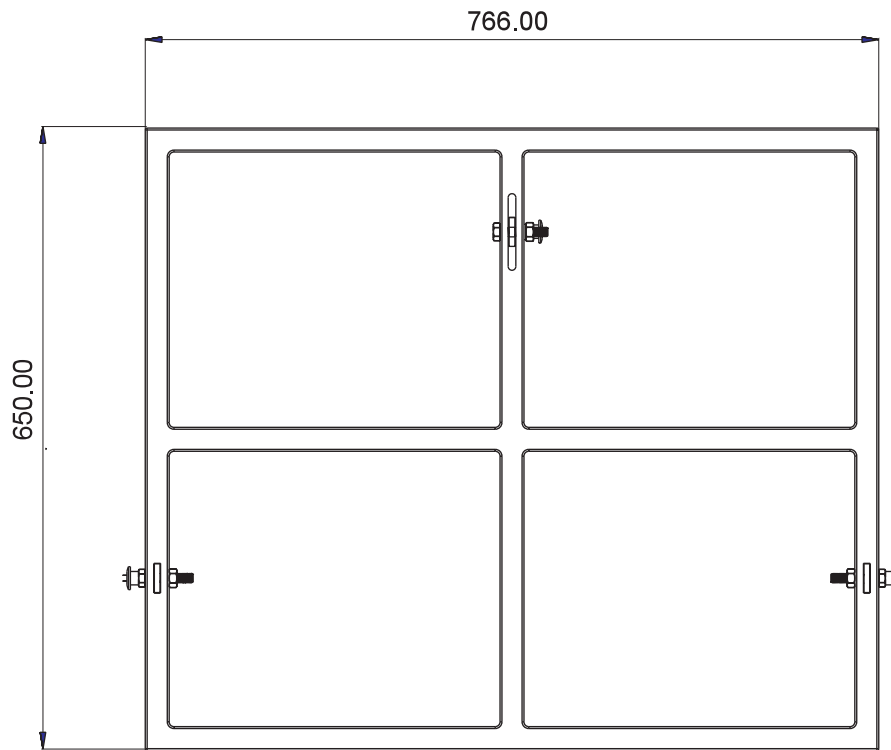
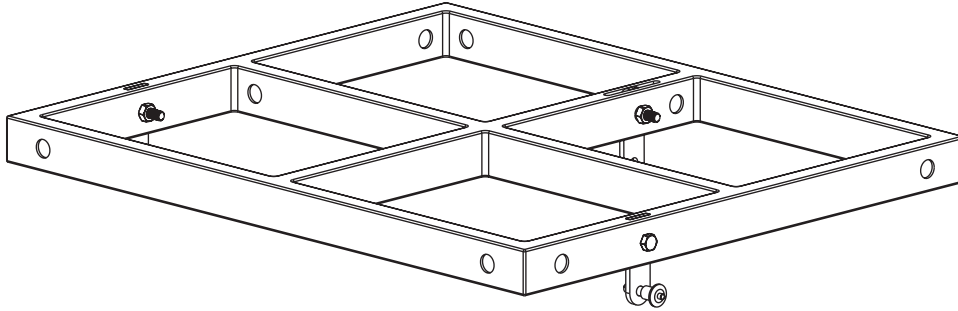


# DIMENSIONAL DRAWINGS-WLA-218B





# DIMENSIONAL DRAWINGS-WLA-28 FLY FRAME

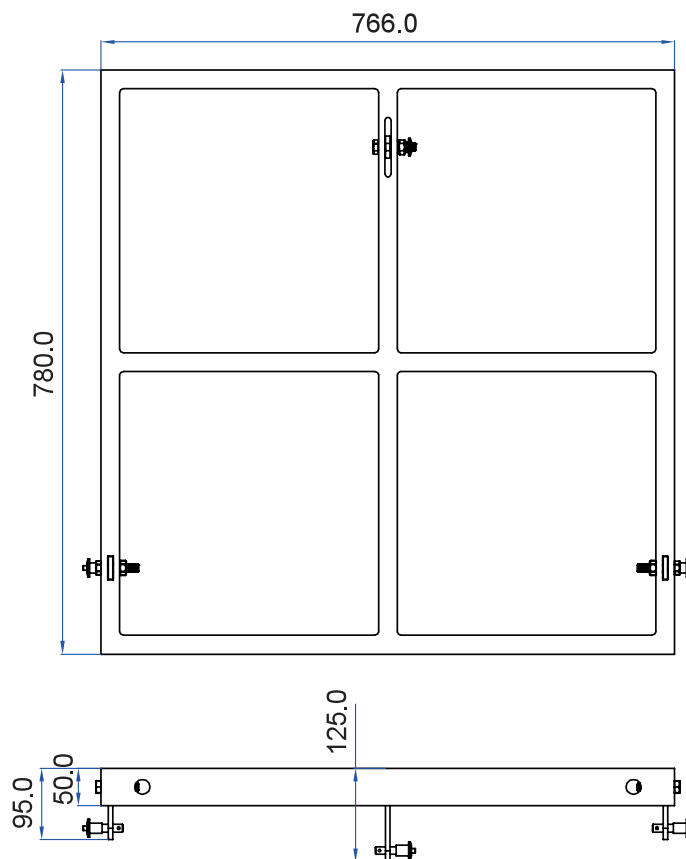
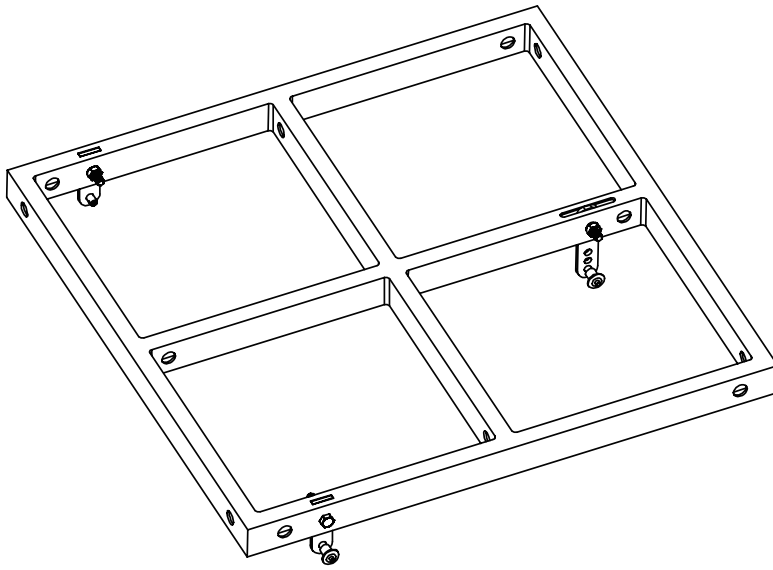


The WLA-28 Fly Frame is certified to hold a total weight (including third party hardware) of 450kg. 12 x WLA-28 and 1 x WLA-15B can be flown with a safety factor of 12.





# DIMENSIONAL DRAWINGS-WLA-28 SUB FLY FRAME

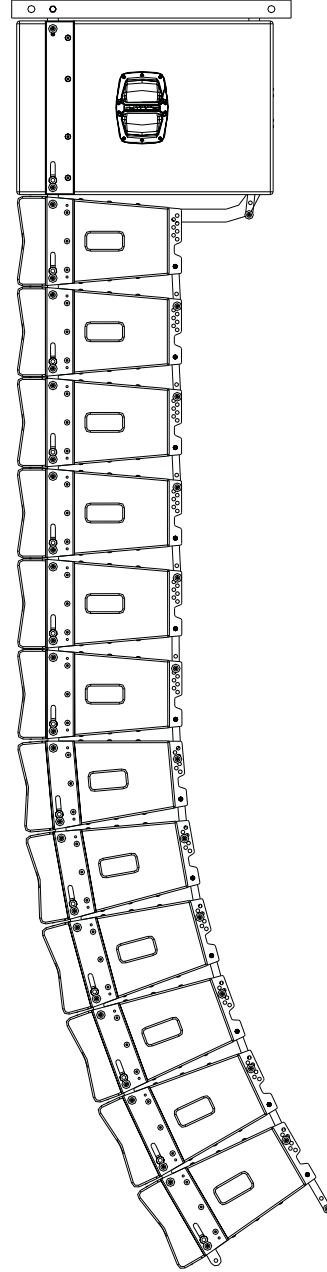
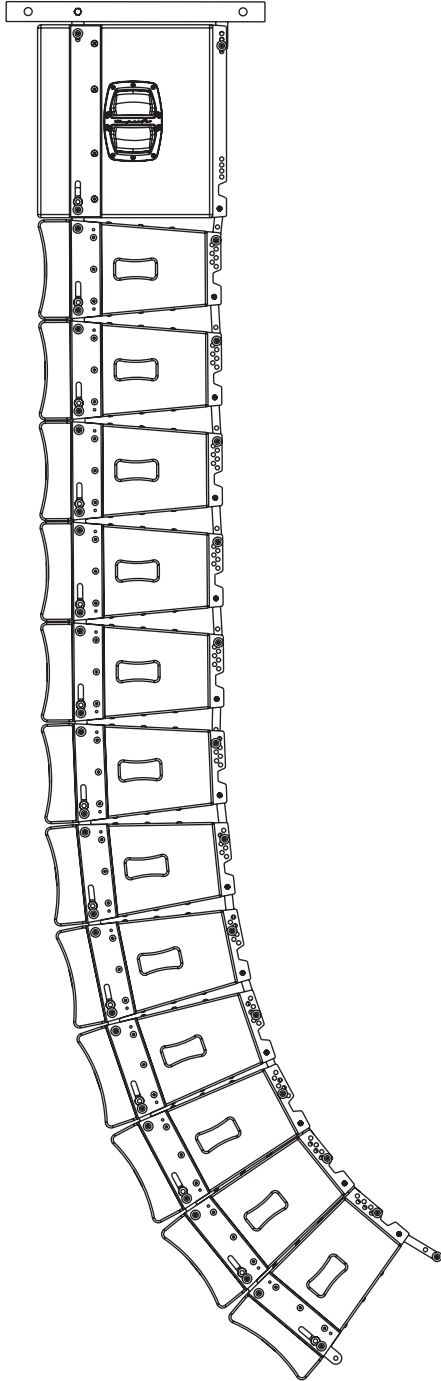


The WLA-28 WLA-28SUB fly frame is certified to hold a total weight(including third party hardware) of 450kg. Up to 12 WLA-28 and 1 WLA-28SUB elements can be flown with a safety factor of 12.





# EXAMPLE ARRAYS



# SPECIFICATION

Model Name	WLA-28	WLA-15B
Features	2 x 8" 2-way	15" Subwoofer
Cabinet Format	10° Line Array Angle	Rectangle
Frequency Response (-10dB)	65Hz - 20kHz	35Hz - 1.5kHz
Sensitivity 1w @ 1m	100dB	99dB
Max SPL	132dB	133dB
Nominal Coverage	100° x 10°	
Power (RMS / Program / Peak)	400W / 800W / 1600W	700W / 1400W / 2800W
Nominal Impedance	LF: 8Ω x 2 HF: 8Ω	8Ω
Crossover Frequency	1.8KHz	
<b>HF Section</b>		
Coil Size	3.2"	
Exit Size	1.4"	
HF Diaphragm Material	Titanium	
<b>LF Section</b>		
Driver Size	8" x 2	15"
Coil Size	2"	4"
<b>System</b>		
Finish	Rhino Rock Black Paint	Rhino Rock Black Paint
Construction Material	Plywood	Plywood
Construction Material Thickness	15mm	15mm
Handles	2	2
Grille	1.2mm black steel	1.2mm black steel
Bi Amp Mode Switch	Yes	No
Inputs	2 x NL4 Speakon	2 x NL4 Speakon
Attachment Points	Integral side plate adjustable rigging	Integral non adjustable
Splay angle range	0° - 10°	Integral non adjustable
Product Dimensions (H x W x D)	250 x 424 x 760mm	485 x 440 x 760mm
Carton Dimensions (H x W x D)	375 x 545 x 855mm	545 x 580 x 860mm
Net Weight	27kg	38.5kg
Gross Weight	33kg	46.5kg



Model Name	WLA-28SUB	WLA-218SUB	WLA-218B
System Type	Passive	Passive	Passive
Configuration	Dual Subwoofer	Dual Chamber Subwoofer	Dual Subwoofer
Frequency Response (+/-3dB)	39-900HZ	30-1.5KHZ	30-1KHZ
Frequency Range (- 10 dB)	39-1.5KHZ	30-1.5KHZ	25-800HZ
Sensitivity 2.83v/1m	108 dB	100dB	109dB
Calculated Maximum SPL @1m	145 dB	138dB	148dB
System Rated Impedance	4Ω	Parallel:4Ω Discrete:8Ω x2	4Ω
<b>Low Frequency Transducer</b>			
LF Size (mm / inches)	381mm / 15"	470mm / 18"	470mm / 18"
LF Voice-Coil Size (mm / inches)	100mm / 4.0"	102mm / 4"	102mm / 4"
LF Magnet Material	ferrite	ferrite	ferrite
LF Frame Material	aluminium	aluminium	aluminium
Rated Impedance	2x8Ω	2x8Ω	2x8Ω
LF Power re:AES2-2012	2X600W	2x800W	2x1000W
System Continuous Power (w)	1200W	1600W Parallel / 800W Discrete	2000W
System Programme Power (w)	2400W	3200W Parallel / 1600W Discrete	4000W
System Peak Power (w)	4800W	6400W Parallel / 3200W Discrete	8000W
<b>Crossover frequency</b>			
Input Connector	2xSpeakon	2xSpeakon	2xSpeakon
Rigging	Integral, non-adjustable	NO	NO
pole mount	NO	NO	NO
handles	yes	4 on Sides	4 on Sides
<b>Enclosure</b>			
cabinet type	square	square	square
Enclosure Material and finish	15mm,18mm plywood	18mm plywood	18mm plywood
Colour Options	black paint	black paint	black paint
Grille Material & Finish	steel	steel	steel
<b>Dimensions - Unpacked (mm / inches):</b>			
Height	485mm/19.1"	541mm / 21.3"	560mm / 22.0"
Width	760mm/29.9"	1041mm / 41"	1065mm / 41.9"
Depth	716mm/28.2"	650mm / 25.6"	756mm / 29.8"
<b>Dimensions - Packed (mm / inches):</b>			
Height	575mm/22.6"	626mm / 25.6"	638mm / 25.1"
Width	850mm/33.5"	1126mm / 44.3"	1138mm / 44.8"
Depth	806mm/31.7"	722mm / 28.4"	829mm / 326.0"
<b>Weight</b>			
Net Weight (kg / lbs)	61.2Kg/134.6lbs	78.9kg / 173.5lbs	74.3.0kg / 164.05lbs
Gross Weight (kg / lbs)	66.0Kg/145.2lbs	86kg / 189.6lbs	88.2kg / 194.0lbs



### **WHARFEDALE PRO LIMITED WARRANTY**

Wharfedale Pro products are warranted of manufacturing or material defects for a period of one year from the original date of purchase. In the event of malfunction, contact your authorized Wharfedale Pro dealer or distributor for information.

\*Be aware that warranty details may differ from country to country. Contact your dealer or distributor for information. These terms do not infringe your statutory rights.







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