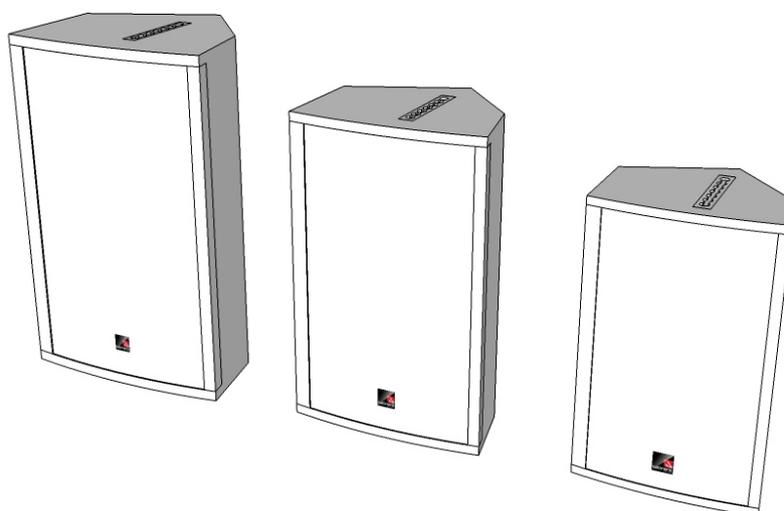




# Operation Manual

Version 2.0



**V Series**

**V-10, V-12, V-15**  
**Multi-purpose Loudspeaker**

Keep these important operating instructions.  
Check [www.tecnare.com](http://www.tecnare.com) for updates.



**General Information**

V Series Operation Manual

Ver.: 2.0\_UK 01/2017

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The information contained in this manual has been carefully checked for accuracy, at the time of going to press, however no guarantee is given with respect to the correctness.

Exel Acoustics SL accepts no responsibility for any errors or inaccuracies that may appear in this manual or the products and software described in it. Technical specifications, dimensions, weights and properties do not represent guaranteed qualities. As manufacturers we reserve the right to make alterations and modifications within the framework of legal provisions, as well as changes aimed at improving quality.

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## IMPORTANT SAFE INSTRUCTIONS

Before using our product, be sure to carefully read the manual and safe instructions. Keep this document with the device all time.

several enclosures on top of one another, use straps to secure them against movement.

- 1 Read these instructions.
- 2 Keep these instructions.
- 3 Heed all warnings.
- 4 Follow all SAFETY INSTRUCTIONS as well DANGER and OBLIGATION warnings.
- 5 Only use attachments / accessories specified by the manufacturer.
- 6 Use only with the cart, tripod, bracket or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart / apparatus combination to avoid injury from tip-over.
- 7 If the equipment is used in a manner not specified by the Exel Acoustic, the protection by the equipment may be impaired.
- 8 Read all the Product Information document before exploiting the system.
- 9 Read the Rigging Manual before installing the system. Use the rigging accessories described in the rigging manual and follow the associated procedures.

**CAUTION:** Rigging should only be done by experience professionals.

- 10 This speaker enclosure is capable of creating a strong magnetic field. Please use caution around the enclosure with data storage devices such as phones, computers or hard drivers.
- 11 Handles are for moving the system only.
- 12 **Beware of sound levels.** Never stand in the immediate vicinity of loudspeaker driven at high level. Professional loudspeaker systems are capable of causing a sound pressure level (SPL) detrimental to human health. Hearing damage can also occur with prolonged exposure to sound: 8h at 90 dB(A), 30 min at 110 dB(A), less than 4 min at 130 dB(A) *Source: European Directive relating to the assessment and management of noise 2002/49/CE*
- 13 When setting up the loudspeaker or loudspeaker stand, make sure they are standing on a firm surface. If you place

## SYMBOLS USED

		
Important operating instructions	Additional information	OBLIGATION. This instructions must be strictly followed
Pour indequer important Instructions	Information complémentaire	Obligation. Cela doit être strictement instructions Suivi
Wichtige Betriebsanweisung oder Gebrauchsanleitung	Informationen. Zusätzliche Informationen	Pflicht. Diese Anweisungen müssen strikt befolgt
Importantes instrucciones operativas	Información complementaria	Obligación. Estas instrucciones deben ser estrictamente seguidas

## **DECLARACIÓN DE CONFORMIDAD**

### **DECLARATION OF CONFORMITY**

#### **EXEL ACOUSTICS SL**

CL Encinar, 282. Polígono Industrial Monte Boyal. 45950 – Casarrubios del Monte (Toledo), España (Spain).

Declara que los productos **V Series** y sus respectivas opciones, cumple con las Directivas:

*Declare under our sole responsibility that devices in the **V Series** range of products, comply with relating Directives:*

- (1) Directiva de Baja Tensión - 2006/95/CE
- (2) Directiva de Compatibilidad Electromagnética - 2004/108/CE
- (3) Directiva RoHS - 2011/65/UE
- (4) Directiva RAEE - 2012/19/UE

- (1) *Low Voltage Directive 2006/95/CE*
- (2) *EMC 2004/108/CE*
- (3) *RoHS Directive 2011/65/UE*
- (4) *WEEE Directive 2012/19/UE*

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# 1 Introduction

## 1.1 Welcome to Tecnare

Thank you for choosing the high-quality Tecnare® **V Series System “Made in Spain”** from **EXEL ACOUSTICS SL**.

Please spare a little time to study the contents of this manual, so that you obtain the best possible performance from this unit.

All Tecnare® products are carefully engineered for world-class performance and reliability.

If you would like further information about this or any other Tecnare® product, please contact us. We look forward to helping you in the near future.

**As part of a continuous evolution of techniques and standards, Exel Acoustics SL as manufacturer of Tecnare® products reserve the right to change the specifications of its products and the content of its documents without prior notice.**

Updates and supplementary information are available on the Tecnare® website:

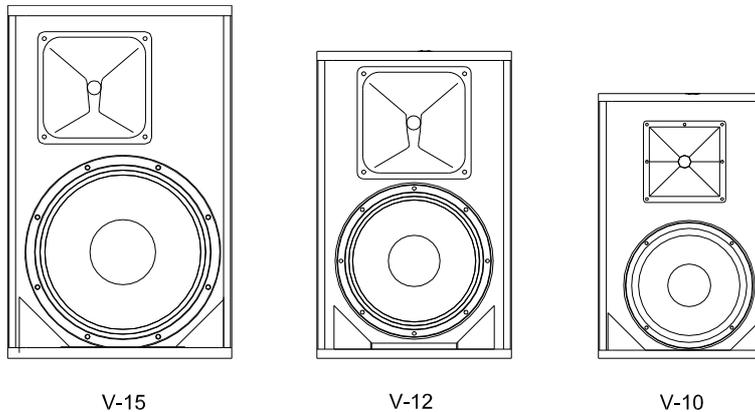
<http://www.tecnare.com>

Tecnare Technical Support is available at:

- (T): +34 918 170 110 - +34 918 171 001
- (e-mail): [support@tecnare.com](mailto:support@tecnare.com)

Thank you again for placing your confidence in Tecnare® products.

## 1.2 Overview



**V Series** means **Versatile** loudspeakers, ideally suited to all kinds of live performance, including stage monitoring.

V Series are synonymous with exceptional sound quality and reliability and are designed for the most discerning musician and audio systems contractor.

V10, V12 and V15 are suitable for distributed sound reinforcement in theatre, congress centre, concert hall, trade show, corporate A/V, houses of worship, club, or television applications.

When used with some Tecna<sup>®</sup> Subwoofer can also be used for side fill, drum fill or small-to-medium format front-of-house (F.O.H.) applications. In addition to these applications, the V Series is specifically optimized for use as a high-performance stage monitoring solution.

The V Series system range and components are formed from:

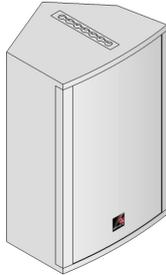
- **V-10, passive/active compact loudspeaker, 90°H x 60°V, 52Hz to 20kHz;**
- **V-12, passive/active multipurpose loudspeaker, 55° to 100°H x 60°V, Rotatable horn, 48Hz to 17kHz;**
- **V-15 passive/active compact High-Power loudspeaker, 55° to 100°H x 60°V, rotatable horn, 42Hz to 17kHz;**

All models are equipped with a pole mount socket and multiple M8 and M10 attachment points and additional installation-friendly features and utilize a rugged grille design and system appearance suitable for nearly all indoor environments.

The line will include a optionally U-brackets, ceiling brackets and a wall mount bracket accessory that provides safe, flexible and simple means of installing for all full-range models in fixed installation as well as in touring applications.

## 1.3 The V Series Loudspeaker

### FEATURES

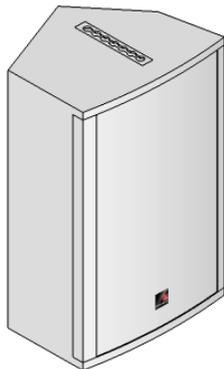


#### **V-10**

The Tecnare V-10 loudspeakers are comprised of:

- One 10-inch driver
- one 1-inch HF compression driver.
- Built-in rigging points (eyebolt) and top rigging track
- A Pole mount socket

The V-10 is a lightweight 2-way passive loudspeaker that used a 10" low-mid frequency transducer in a bass-reflex cabinet and a 1" compression driver on a rotatable horn. The internal passive crossover network uses a custom filters.

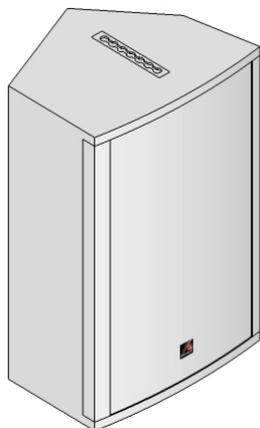


#### **V-12**

The Tecnare V-12 loudspeakers are comprised of:

- One 12-inch driver
- one 1.4-inch HF compression driver on a rotatable CD horn
- Built-in rigging points (eyebolt) and top rigging track
- A Pole mount socket

The V-12 is a multipurpose 2-way passive loudspeaker that used a 10" low-mid frequency transducer in a bass-reflex cabinet and an one 1.4" compression driver on a rotatable horn. The internal passive crossover network uses a custom filters.



#### **V-15**

The Tecnare V-15 high-power loudspeakers are comprised of:

- One 12-inch driver
- one 1.4-inch HF compression driver on a rotatable CD horn
- Built-in rigging points (eyebolt) and top rigging track
- A Pole mount socket

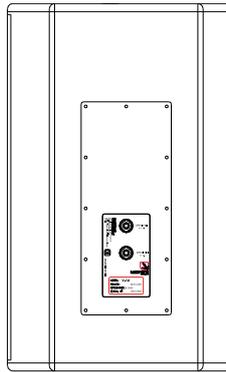
The V-15 is a high-power 2-way passive loudspeaker that used a 15" low-mid frequency transducer in a bass-reflex cabinet and a 1.4" compression driver on a rotatable horn. The internal passive crossover network uses a custom filters.

## 1.4 Connections

**V Series** loudspeakers utilize Neutrik® SpeakON® connectors. There are two NLT4 connectors on the rear of each V Series enclosure. These connectors mate with Neutrik® NL-4 or NL-4 compatible in-line cable connectors. The pins 1+/1- of both connectors are wired in parallel to link multiple loudspeakers on a single amplifier output. Remember that parallel connection reduces the total impedance ( $\Omega$ ) seen by the amplifier.



The total impedance of loudspeaker connected in parallel must not drop below the minimum operating impedance of the amplifier.



The following subsections describe the electrical connections of V-10, V-12 and V-15.

IN speakON® point	1+	1-	2+	2-
Connection	IN +	IN -	NC	NC

The V Series uses the pin assignment 1+/1+.

Using one as the input, the second connector allows for direct connection to a second cabinet.

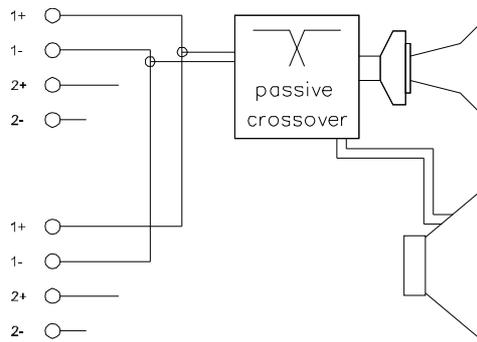


Fig.1.- Wiring diagram

## 1.5 Processing and Amplification

Only operate Tecnare loudspeaker with a correctly configured Tecnare preset. Tecnare offer a complete solution that guarantees the highest level of performance. A complete range of controllers, amplified and amplified controller with DSP are available to get this objective. Otherwise, there is a risk of damaging the loudspeaker components.

### 1.5.1 Processing

There are two options using our digital controllers. Our [DP2696](#) or [DP4896](#). The options vary depending on the final application. *Refer to DP2696 or DP4896 user manual.*

Preset for DP Series processors have been developed for the V Series. You may obtain the settings from the DP Series at <http://www.tecnare.com> website.

### 1.5.2 Amplification

To power *V Series*, Tecnare recommends amplifiers with the power ratings enough to feed the loudspeakers. For high power or live applications, it is recommended to oversize the amplifiers relative to the nominal AES output of the loudspeakers. A lower power amplifier will not reduce the chances of driver damage due to over-excitation, and may actually increase the risk of thermal damage due to sustained clipping.

In certain specific cases it is possible to slightly under-power the subs or loudspeakers as long as the amplifier will not be driven to its limits.

In any case, the Tecnare processors should be deployed in front of the amp to ensure that the amplifiers to not go into clip.

The **DP4896** processors also include:

- Virtual Xover Limiter for passive systems
- Thermal protection from power surges or overload
- Xmax Excursion displacement protection

The **T20-44** amplifier is the ideal companion for maximum performance of the V Series loudspeakers. This amplifier controller with DSP offer a complete both preset and protection solution for any application.

## 2 Loudspeakers Configurations

### 2.1 Configurable Asymmetrical Horn

The **V Series** loudspeakers are designed for standing, vertical and horizontal operation. A variety of accessories is available from Tecnare® to securely attach the loudspeaker, e.g. on stands or suspended horizontally or vertically from trusses and motor lifts.

In some situations, it may be advantageous to switch the coverage of the high frequency range. For this purpose the Asymmetrical Dispersion Constant Directivity horn is an important feature of the **V Series**. The horn can be rotated in four different positions and can be useful for specialized applications such as complex arrays, systems designed with CAD software and stage monitoring.



Ensure that the loudspeakers are securely attached to prevent personal injury and property damage.

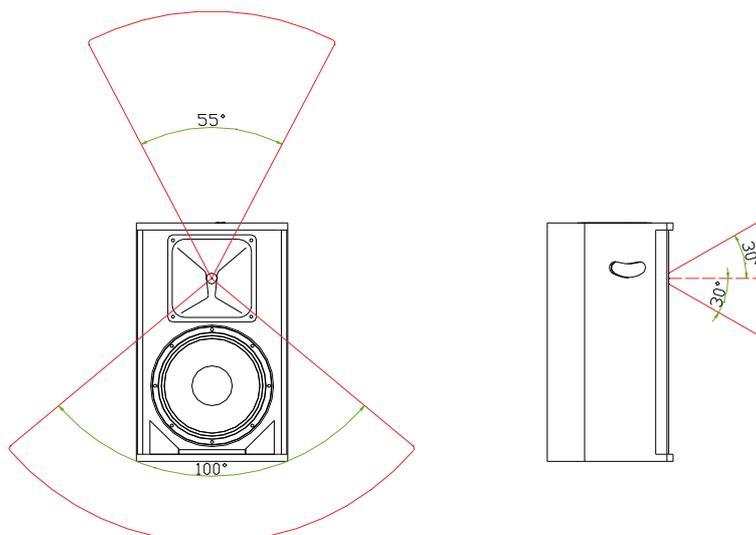


NOTE

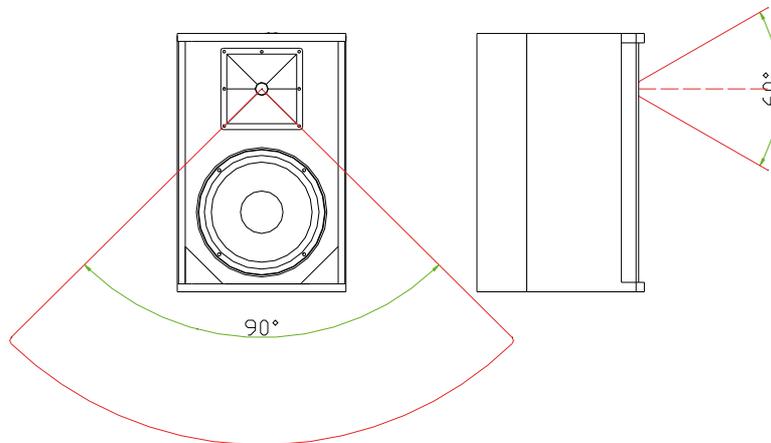
TECNARE recommends using only the accessories specified by TECNARE to secure the loudspeakers.

### 2.2 Front of House configuration

Good coverage of audiences often requires a conflicting combination of wide coverage ("short-throw") for the closest listeners (below cabinet axis) and narrow coverage ("long-throw") for distant areas (on or above axis). The **V-12** and **V15** loudspeaker horizontal horn coverage varies from "short-throw" to "long-throw" along the vertical axis to precisely match these practical requirements in a single system. For the majority of applications, the asymmetrical horn should be used with its "wide" dispersion side directed towards the floor, but all four cabinet orientations are usable.



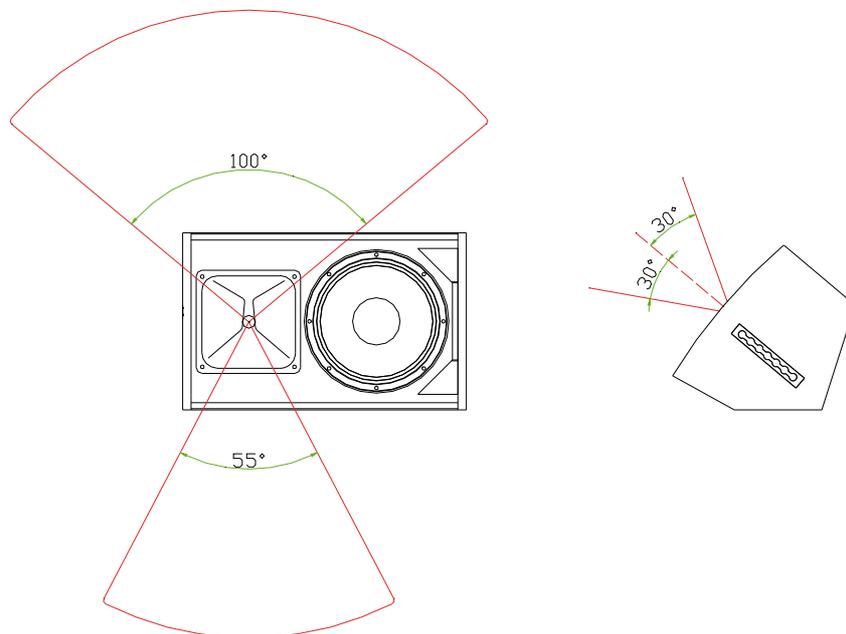
The horn of V-10 loudspeaker is mounted at the factory in such a way that the horizontal coverage is 90° and the vertical coverage is 60°. You can easily re-orient the V-10 rotatable horn to its 60° x 90°.



### 2.3 Stage Monitor Configuration

For stage monitors the required coverage is always wider when performers are close to the wedge (above the horn axis) than when they move away from it (below the horn axis). For floor monitor use the horn must be rotated with its "wide" dispersion side directed towards the top of the cabinet in wedge position as shown in the below figure.

The specific dispersion pattern, the HF driver and the very high power handling all contribute to the exceptional performance of the V Series as a wedge monitor.



## 2.4 Rotating the Horn

Access to the horn for configuration and checking is easily made by removing the front grille.

1. Place the V Series loudspeaker with the wedge inclined toward you with the front grille facing up. Ensure that the working surface is clean with a non-slip finish.
2. To remove the front grill of the loudspeaker, use a 4 mm hex key. Remove the six fixing screws placed at both side loudspeaker enclosures.
3. Remove the two brackets carefully that holding the grille.
4. Release the four screws of the horn using a hex key. Pull the horn and the compression driver upward out of the loudspeaker enclosure.
5. Check that the seal between the enclosure and horn is properly seated.
6. Rotate the horn carefully on the desired position and reinsert the horn and driver back into the recess. Screw it onto the enclosure using medium-strength thread locker.
7. Screw the front grill back on.

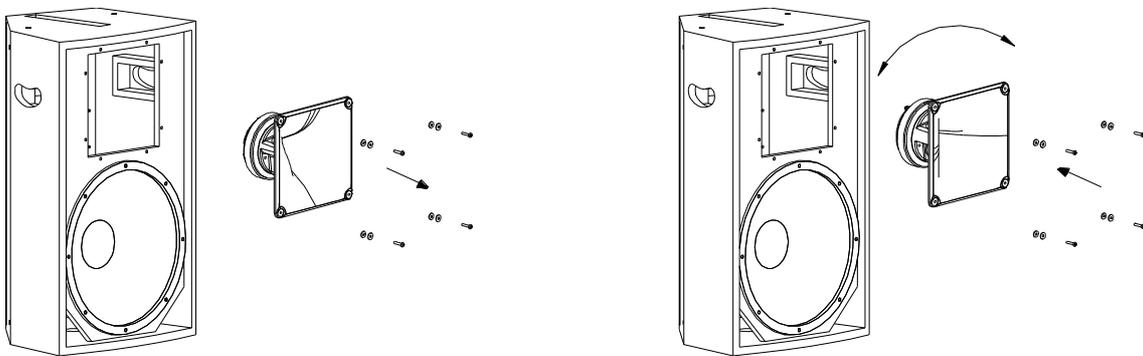


Fig.2.- Change of configuration on V-12 and V-15

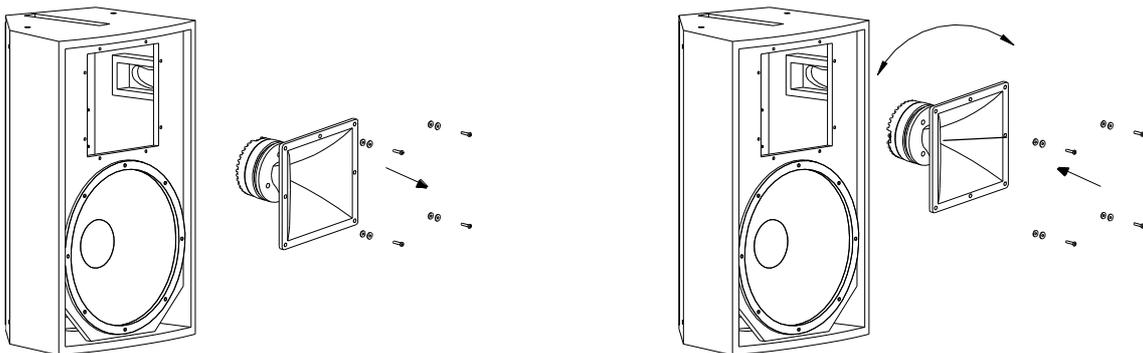


Fig.3.- Change of configuration on V-10

## 3 Amplifier selection for V Series

### 3.1 Recommended Amplifier Power

Tecnare recommends amplifiers in agreement with table below:

Model	Full-Range/ Parallel	Model recommended
V-10	200 to 700 W @ 8Ω	PA900/PA2100/PA4.450/T-Series
V-12	300 to 1.000 W @ 8Ω	PA900/PA2100/PA3000/PA4.450/T-Series
V-15	400 to 1.100 W @ 8Ω	PA900/PA2100/PA3000/PA4.450/T-Series

### 3.2 Recommended Speaker Cables

Choosing the right wire gauge for your installation is utmost importance to ensure you will get the maximum potential of your system.

The two primary things resistance affects in the amplifier-to-loudspeaker connection are: insertion loss and damping factor, both of which are dependent upon cable resistance. Too small a cable section will increase both its serial resistance and its capacitance; this reduces the electrical power delivered to the loudspeaker and can also induce response (damping factor) variations.

#### INSERTION LOSS

Insertion loss is the measure of the loss of load power at the speaker due to excessive resistive losses of the cable or any additional component attached between the amplifier and the loudspeaker. We typically express this loss in decibels (dB) using the following formula:

$$IL = 20 \bullet \log \left( \frac{R_{load}}{R_{load} + R_{cable}} \right)$$

#### DAMPING FACTOR

Damping factor is a ratio of rated loudspeaker impedance (ZL) to the source impedance (Zs). In this case our source impedance is (Rcable + Ramplifier).

$$\text{Damping Factor} = Z_L / Z_s$$

The table below indicates the cable valor recommended by Tecnare®.

cable cross-section			Recommended maximum length					
			8 Ω		4 Ω		2 Ω	
mm <sup>2</sup>	SWG	AWG	m	ft	m	ft	m	ft
2,5	15	13	30	100	15	50	10	33
4	13	11	50	160	25	80	17	53
6	11	9	74	240	37	120	25	80
10	9	7	120	390	60	195	40	130

**IMPORTANT**



Long speaker cables induce capacitive effects – up to hundreds of pF depending on the quality of the cable - with a low-pass effect on high frequencies. If long speaker cables must be used, ensure that they do not remain coiled while in use.

## 4 Recommended configuration for V Series

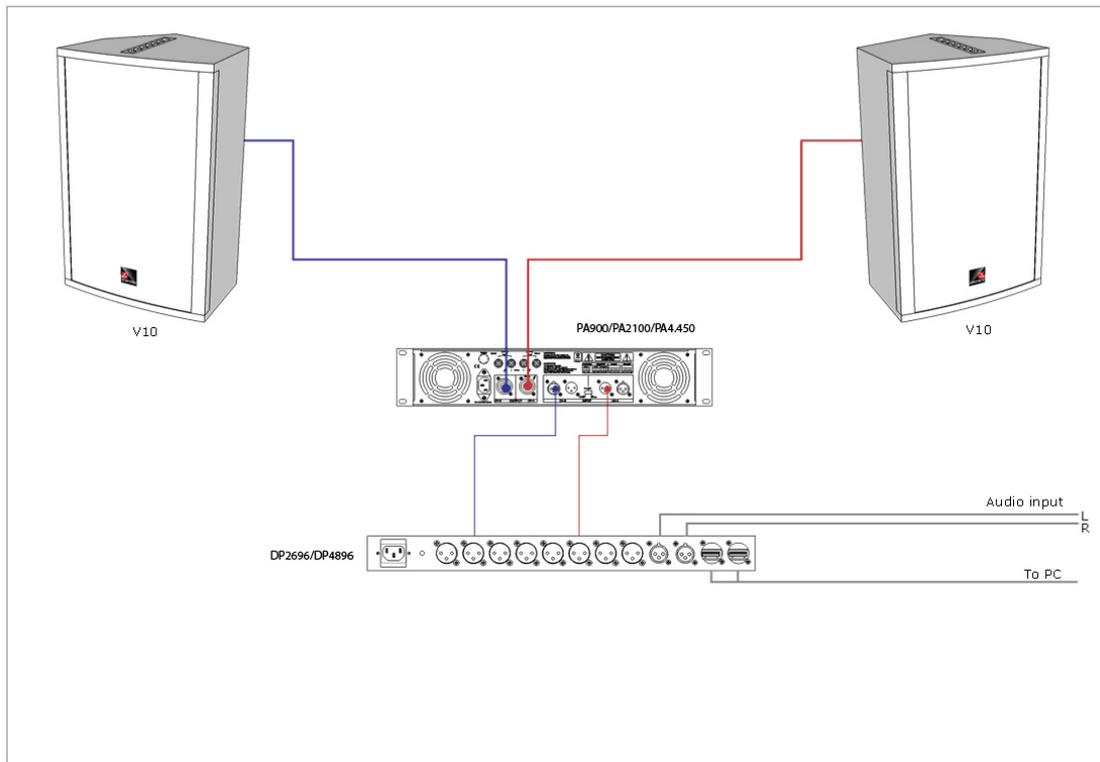


Fig.4.- 1 x V-10 L/R configuration

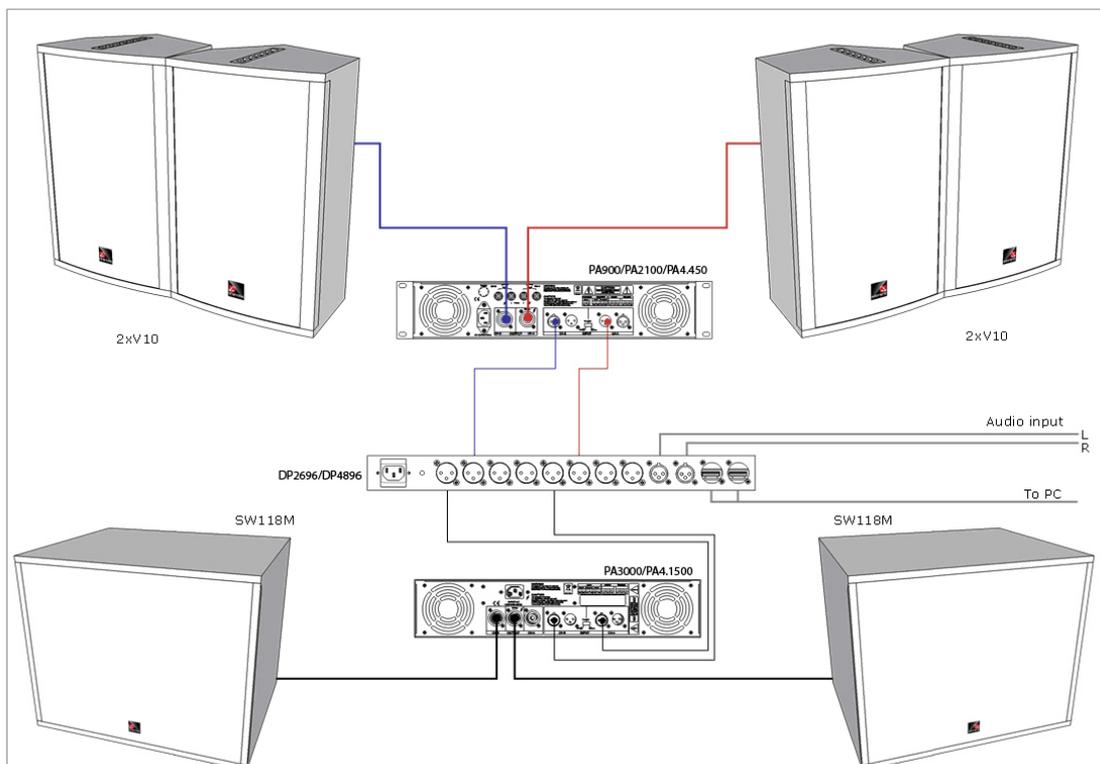


Fig.5.- 2 x V-10 + SW-118M L/R configuration

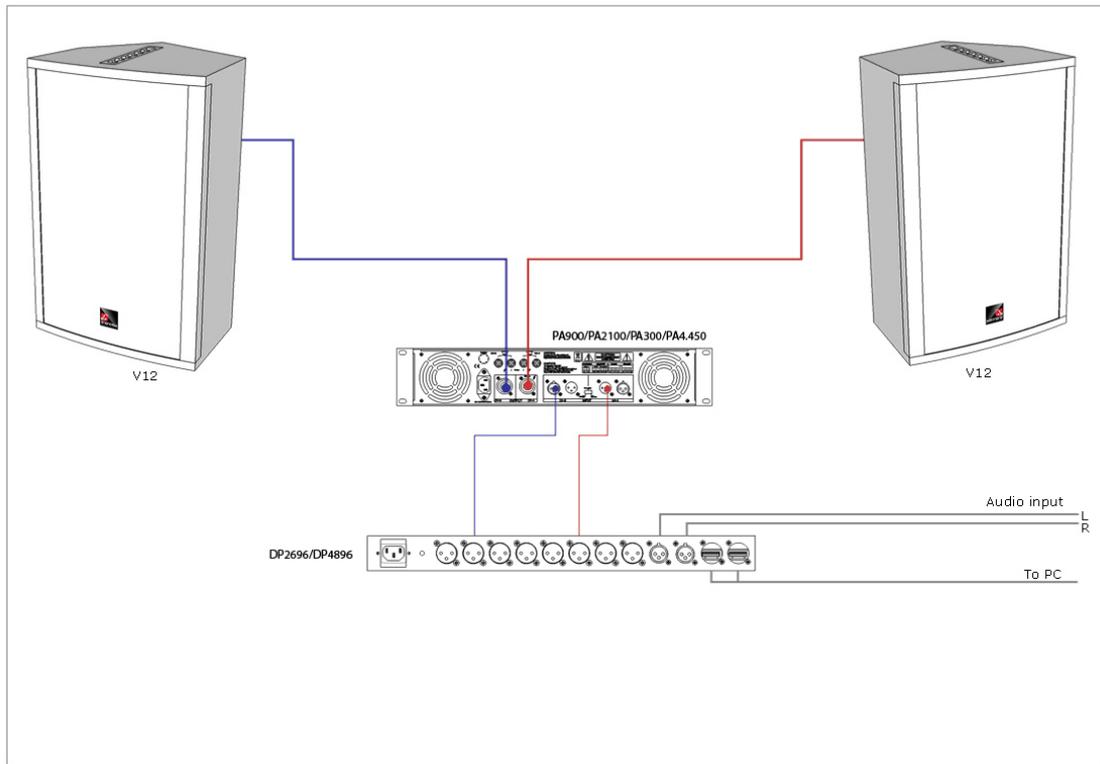


Fig.6.- 1 x V-12 L/R configuration

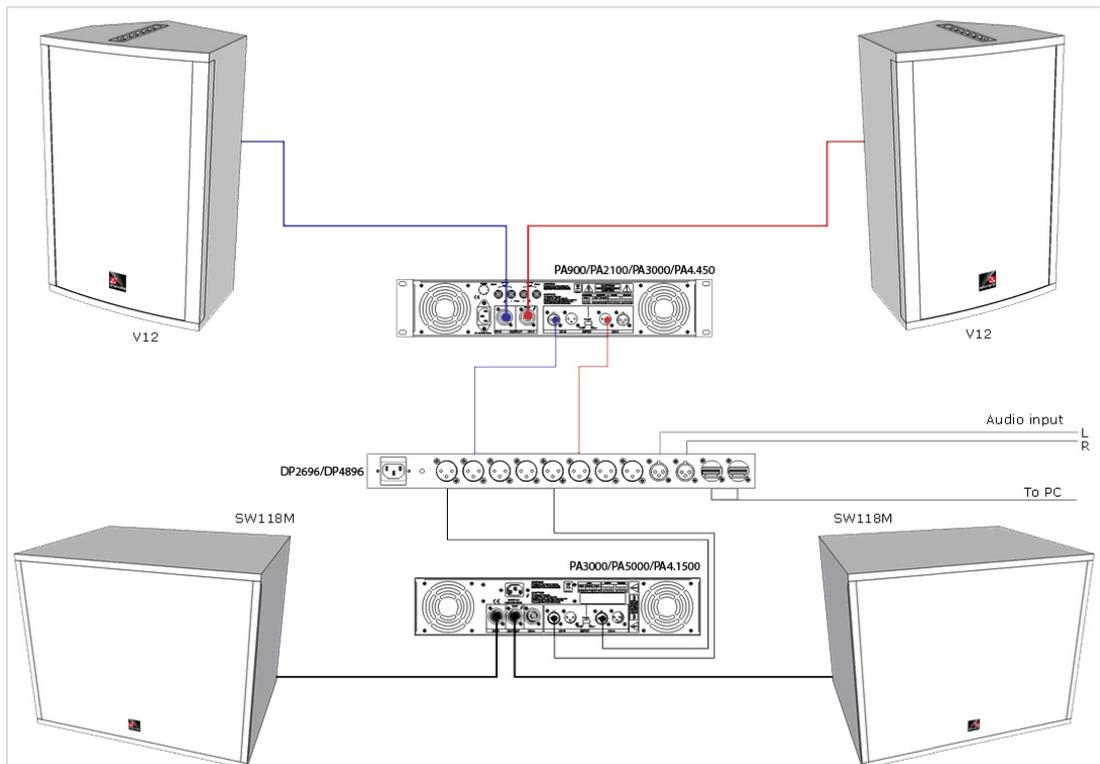


Fig.7.- 1 x V-12 + SW-118M L/R configuration

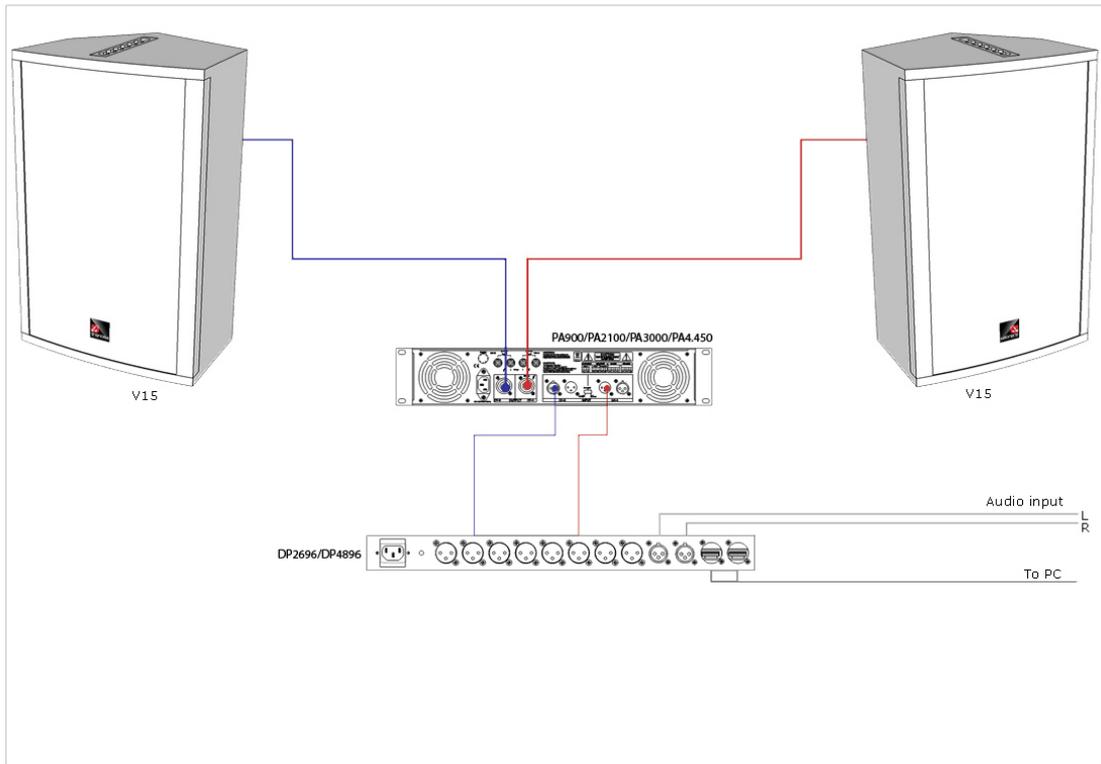


Fig.8.- 1 x V-15 L/R configuration

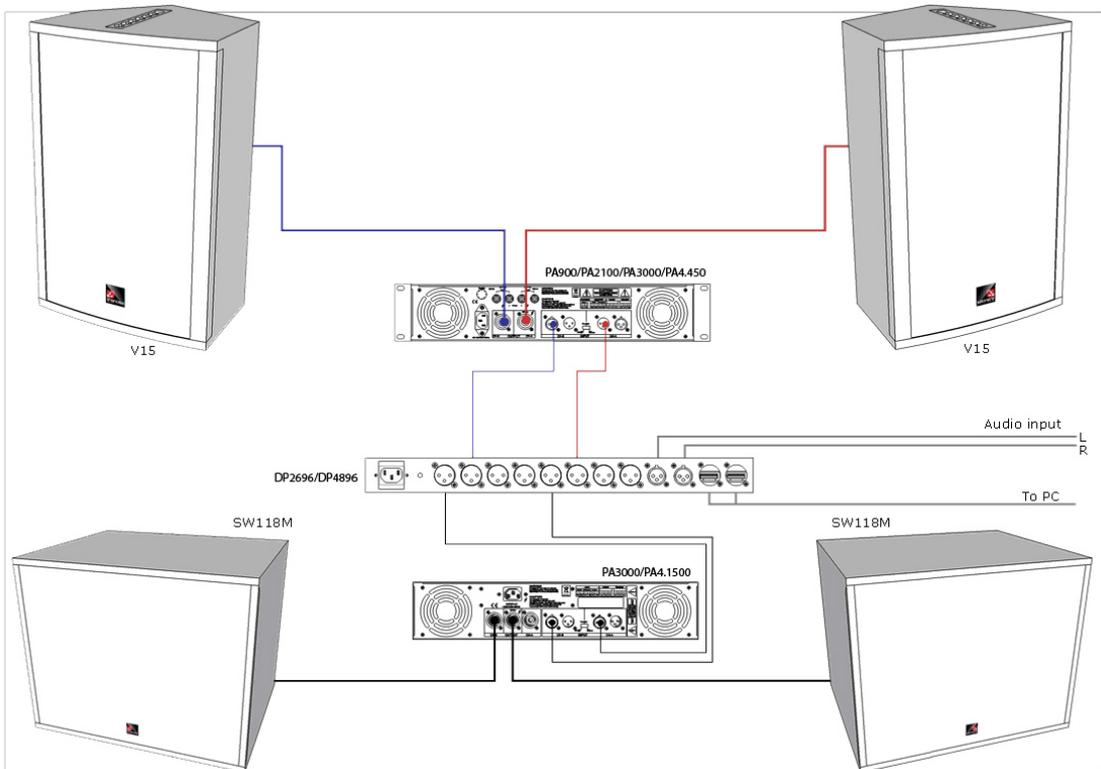


Fig.9.- 1 x V-15 + SW-118M L/R configuration

## 5 Flying and Suspension

Tecnaire V Series offers 3 kind optional accessories for suspendable: TUB U-Bracket, Double Stud Ring, and TSC-350 Wall Mount.

Before attempting to suspend your speakers, read and understand the following safety information.

### 5.1 Important Safety Warning



The information in this section has been assembled from recognized engineering data and is intended for informational purposes only. None of the information in this section should be used without first obtaining competent advice with respect to applicability to a given circumstance. None of the information presented herein is intended as a representation or warranty on the part of Tecnaire. Anyone making use of this information assumes all liability arising from such use.

Correct use of all rigging hardware is required for secure system suspension. Careful calculations should always be performed to ensure that all components are used within their working load limits before the array is suspended. Never exceed the maximum recommended load ratings.

Before suspending any speaker system always inspect all components (enclosure, rigging frames, pins, eyebolts, track fittings, etc.) for cracks, deformations, corrosion, missing, loose or damaged parts that could reduce strength and safety of the array.

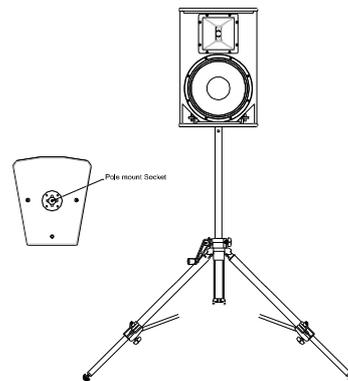
Do not suspend the speaker until the proper corrective action has been taken.

Use only load-rated hardware when suspending V Series Loudspeaker.

### 5.2 Tripod Use

The V-10, V-12 and V-15 models are equipped with a pole mount socket for use with a standard 35mm tripod.

Do not use the tripod on non-flat floors and be careful not to raise the cabinet too high on the tripod, as it may become unstable.



### 5.3 Flying

Only experienced installers with adequate knowledge the equipment and local safety regulations should fly speaker boxes. It is the user's responsibility to ensure that the systems to be flown (including flying accessories) comply with state and local regulations.

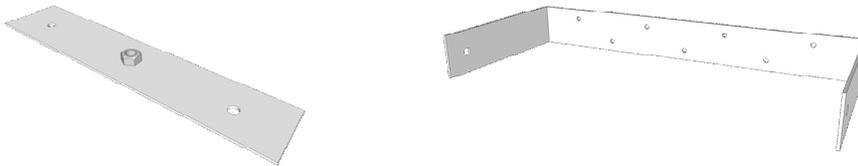


**CAUTION:**  
DO NOT SUSPEND THE CABINETS FROM HANDLES

## ELEMENT FOR FLYING AND WALL-MOUNTING

### 5.3.1 U-Bracket Accessories

V10, V-12 and V-15 could be flying with TUB brackets.

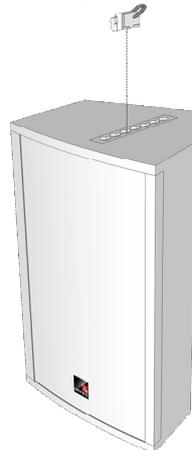


The LP-Plate and TUB bracket is an optional accessory for wall mounting mainly for horizontal placement.

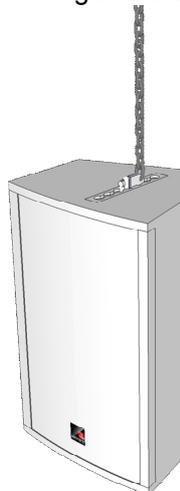
Please, refer to BR operation manual to get more information.

### 5.3.2 Flow Vertically Procedure

1. Place the Double Stud Ring into the cargo rigging track



2. Join the Double Stud Ring to the chain and climb



### 5.3.3 Mounted on the wall Procedure

Items required:

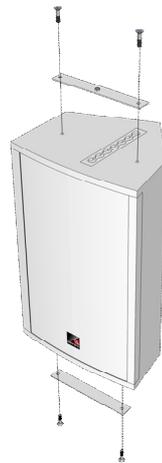
- LP\_V10/LP\_V12/LP\_V15
- TUB\_V10 / TUB\_V12 / TUB\_V15



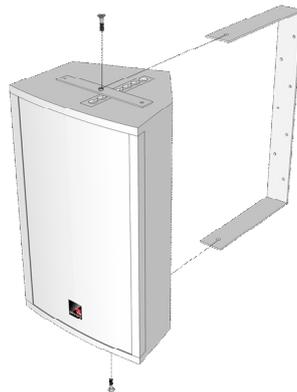
**IMPORTANT** Ensure that the surface – wall or ceiling – is strong enough to hold 4 times V cabinet weight and that the screws 12mm diameter and corresponding plugs required to fix the “U” bracket on the wall or under the ceiling are properly dimensioned.

**Procedure:**

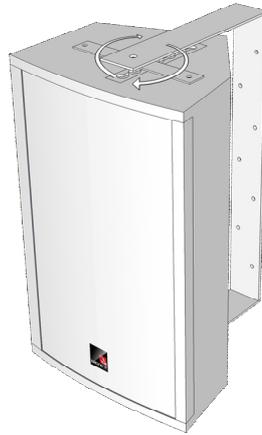
1. Remove the two up-side screws from the box.
2. Fill each screw hole with locktite<sup>®</sup> 243 (*Not provided*) or equivalent
3. Place the LP\_V accessory and secure it with 2 screws.



4. Hold the TUB\_V10 / TUB\_V12 / TUB\_V15 to the wall.
5. Place the unit to the TUB accessory and secure it with the screws.



6. Position the V loudspeaker to desired angle.



#### 5.3.4 Flying with Eyebolts

V Series loudspeakers feature several internal steel angles, with 2 mounting threads each. This angles provides different flying points. Eyebolt flying points are factory sealed with M8 and M10 screws, which are replacement with eyebolt (*not provided*) on the flying points as required. It is specially recommended for fixes d installations where the boxes are permanently fixed.

#### 5.3.5 Over on SW118M



## 6 Technical specifications

Model	V-10	V-12	V-15
<b>Frequency Range</b>	52 Hz to 20 kHz	48 Hz to 17 kHz	42 Hz to 17 kHz
<b>Components</b>	LF:10" / HF:1"	LF: 12" / HF: 1.4"	LF:15" / HF:1.4"
<b>Nominal Dispersions</b>	90° x 60° Rotatable Horn	55 to 100° x 60° Rotatable Horn	155 to 100° x 60° Rotatable Horn
<b>Impedance</b>	8 ohm	8 ohm	8 ohm
<b>Axial Sensitivity (1w/1m)</b>	97 dB SPL	100 dB SPL	101 dB SPL
<b>Calculated SPL</b>	124dB / 130dB	128dB / 134dB	130dB / 136 dB
<b>Power Handling AES</b>	350 w	520 w	720 w
<b>Peak Power Handling</b>	700 w	1040 w	1050 w
<b>Dimensions (H x W x D)</b>	523 x 340 x 290 (mm) 20.67" x 13.38" x 11.42"	645 x 390 x 392 (mm) 25.39" x 15.35" x 15.43"	715 x 445 x 395 (mm) 28.15" x 17.5" x 13.34"
<b>Net Weight</b>	14,4kg. (31.75lbs.)	24kg. (49.29lbs.)	28,3kg. (62.40lbs.)
<b>Construction</b>	Birch Plywood	Birch Plywood	Birch Plywood
<b>Connectors</b>	2 x NL4 Speakon®	2 x NL4 Speakon®	2 x NL4 Speakon®
<b>Color</b>	Grey Poliurea	Grey Poliurea	Grey Poliurea
<b>Accessories</b>	LP-10+TUB-V10, TSC-350 Soft cover, Double Stud Ring	LP-12+TUB-V12, TSC-350 Soft cover, Double Stud Ring	LP-15+TUB-V15, TSC-350 Soft cover, Double Stud Ring

Application information is presented for guidance only. Exel Acoustics SL reserves the right to make any necessary changes to the products and the published specifications. As part of the ongoing development program Exel Acoustics SL tries to maintain the highest degree of product compatibility.



*Reinventing The Rules*



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**V Series** Operation manual

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