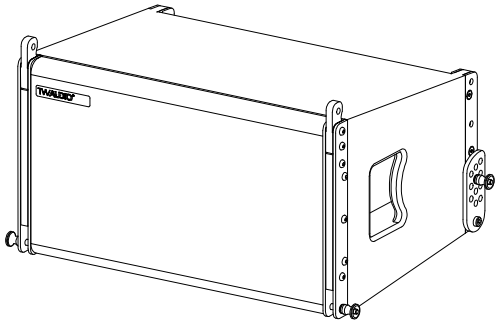
TWAUDIO®

VERA10 | Operation manual



Introduction

Thank you for choosing a high-quality product “MADE IN GERMANY” from the brand TW AUDiO.

Named for the VERtical Arrays in which these systems are used, our VERA line array solutions are transforming large-format sound reinforcement, led by the VERA10 series. The series is based on the VERA10 top, a compact line array element measuring just 50 cm (19.7“) in width yet scalable up to an array length of 18 elements.

This means that the VERA10 is arguably the most versatile component in the whole TW AUDiO range – with just two tops, a core VERA10 system can be created to deliver uncompromising high quality sound reproduction in an extremely compact format. Yet VERA10 has been designed and developed to deliver so much more.

The starting point was the desire to provide our customers with a single, flexible system that can be extended with a multitude of additional components to meet their specific requirements. Everything from gala events, touring roadshows, through to large, open-air or stadium rock concerts can be served with an investment in VERA10.

The modular design of the VERA10 series offers countless possibilities for every user. Whether flown or stacked, VERA10 offers you a fully flexible solution for delivering the very best in audio reproduction for every event, from small gigs to mid-sized indoor shows and even open-air concerts.

Within the VERA10 top element itself is a single 10“ loudspeaker and two 1“ high frequency drivers. Our compression chamber phase plug is positioned in front of the 10“ chassis while VERA10‘s optimised waveguide is coupled to the HF-drivers, all combining to deliver striking tonal depth with sparkling high end in 10 degree vertical dispersion.

Exchanging the mid-high horn allows the horizontal dispersion to be set to either 80 or 120 degrees. Additional versatility is achieved by the addition of the optional PWVERA10 passive crossover which makes it possible to switch between passive operation on a single amplifier channel and standard bi-amped, two-way active operation.

If you lend your product to another party, inform that party of the safety-related operating procedures and hand over this assembly guide. If you require additional copies of this manual, you can obtain them free of charge from TW AUDiO or download them from www.twaudio.de

Instructions in this user manual

Strictly adhere to the instructions contained in this operating manual that are marked as follows:

This symbol in combination with the signal word “Warning” identifies a potentially hazardous situation. Failure to comply with this safety instruction can lead to serious injury or even death.

This symbol in combination with the signal word “Warning” identifies a potentially hazardous situation for persons with a pacemaker. Failure to comply with this safety instruction can lead to serious injury or even death.

This symbol in combination with the signal word “Caution” identifies a potentially hazardous situation. Failure to comply with this safety instruction can lead to light or moderate injury.

This symbol in combination with the signal word “Note” identifies a potentially hazardous situation. Failure to comply with this safety instruction can lead to product damage.

This symbol in combination with the signal word “Tip” identifies additional information or notes that will simplify working with TW AUDiO products on the basis of practical experience.

Notes on the products

Read manual before use!

Before using the device, carefully read the operating manual and keep it with the VERA10 loudspeaker.

General information

Operation manual: OM-VERA10
Version 2.1 en, 12/2024
© by TW AUDiO 2024; all rights reserved.

All information contained in this operating manual was correct to the best of our knowledge at the time of printing.

Quality warranties or assurance of suitability for a certain type of use based on the technical specifications, dimensions and weights are not granted by TW AUDiO.

TW AUDiO also shall not assume liability for any secondary damage (property damage and/or personal injury) nor for the failure to comply with this operating manual!

TW AUDiO reserves the right to update this document based on recent developments.

TW AUDiO INTERNATIONAL GmbH
Osterholzallee 140-2
71636 Ludwigsburg (Germany)

Phone : + 49 (0) 71 41-48 89 89 0
Fax: + 49 (0) 71 41-48 89 89 99
E-Mail: info@twaudio.de
WWW: www.twaudio.de

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1. Safety | Intended use

Please adhere to the following safety instructions to avoid risks when operating loudspeakers.

The VERA10 loudspeaker was developed for use in professional sound systems. The loudspeaker may only be used by trained and qualified personnel.

Note the operating modes described in this operating manual. Other uses are not permissible.

Damage caused by improper use is not covered by TW AUDiO.

WARNING

Loudspeakers generate an electromagnetic field. Persons with pacemakers are not permitted to remain in the immediate vicinity of loudspeakers as the electromagnetic fields can cause pacemakers to malfunction.

WARNING

When working with heavy loads exceeding 20 kg (44 lbs.), use suitable aids (dollies, hoisting slings, etc.). Multiple persons may be required depending on the situation.

Ensure that the units are in a stable position and are firmly attached. A falling loudspeaker can result in serious personal injury and property damage.

When using and assembling TW AUDiO loudspeakers, only use materials specified by TW AUDiO. These tasks must be performed by qualified personnel. Adhere to the applicable safety regulations.

NOTE

When setting up loudspeakers, ensure that they are not exposed to the following ambient conditions:

- Direct sunlight
- Humidity
- Jolting
- Dust

WARNING

Keep away from the immediate vicinity of loudspeakers that are operated at high sound pressure levels. These loudspeaker systems are capable of endangering your health. Sound levels beginning as low as approximately 90 dB SPL can lead to long-term hearing impairment.

NOTE

Avoid:

- Feedback
- Distorted signals (clipping) and
- Peaks resulting from switching on devices, plugging in devices or unplugging devices during operation.

Such signals can lead to loudspeaker overload and ultimately to loudspeaker failure.

Ensure that the loudspeaker is not exposed to permanent thermal overloads. Thermal overloads may cause a fire and result in serious personal injury and property damage.

Note that TW AUDiO does not provide a warranty for damage that can be attributed to this type of overload and therefore cannot be held liable for any secondary damage.

A permanent magnetic field is present in the immediate vicinity of loudspeakers. Ensure that objects which react sensitively to magnetic fields are not located in the immediate vicinity of the loudspeaker. In particular, this applies to magnetic storage media, magnetic stripe cards such as debit cards and CRT displays. A distance of approximately one meter is sufficient to avoid damage.

Check loudspeakers and accessory parts regularly for visible wear. This is essential to ensure continuing fault-free operation. Worn parts should be replaced immediately. Spare parts are available from TW AUDiO.

2. Overview

2.1 Components

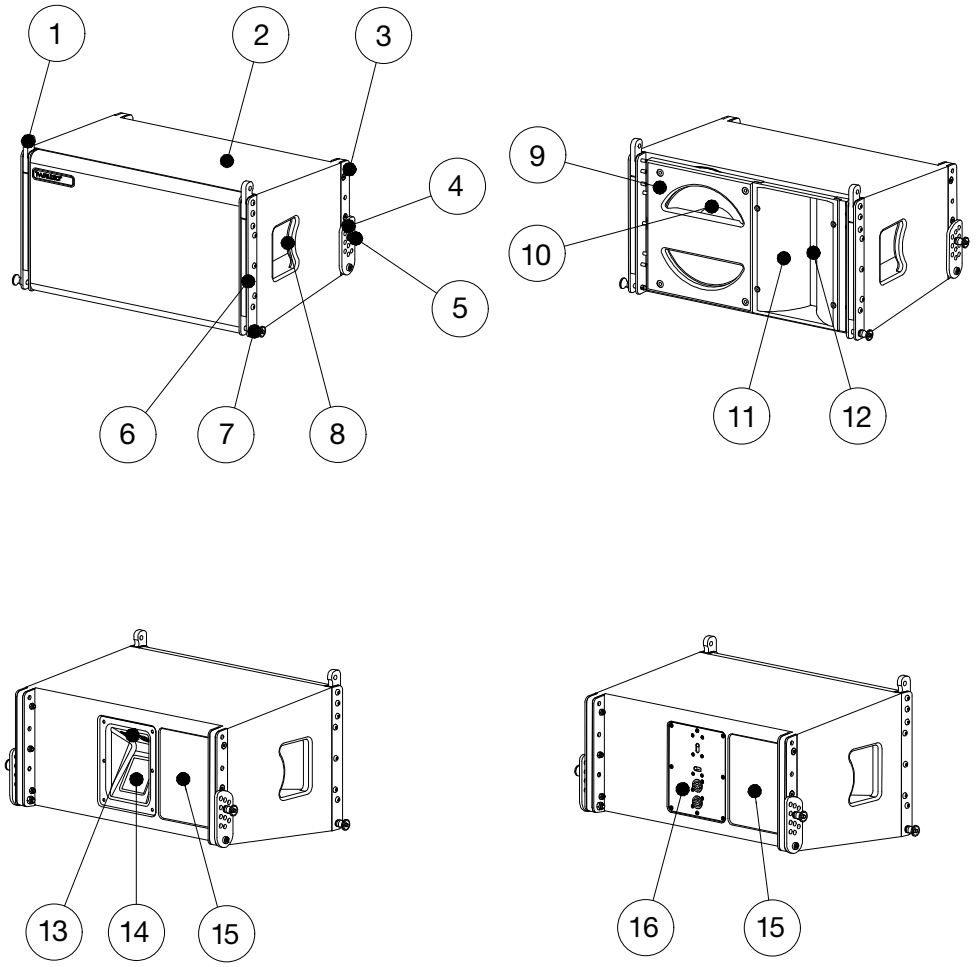

Figure 2.1 - Overview

1. Splay link
2. 15 mm multiplex enclosure – polyurea finish
3. VERA10 „rear“ rigging plate
4. Splay link
5. Locking pin 8×30
6. Ergonomic carrying handles (left and right)
7. Locking pin 8×20
8. VERA10 „front“ rigging plate
9. Phase plug
10. 10“ cone drivers
11. Waveguide with two 1“ compression drivers
12. Exchangeable horn
13. Standard connection panel with two speakON® connectors
14. Type label
15. Label plate
16. Passive crossover PWV10

2.2 Variants

The VERA10 loudspeaker comes in four different variants. These are differentiated by their horizontal coverage (80° or 120°) and are further subdivided into VERA10A (BIAMP model) and VERA10P (PASSIVE model).

2.2.1 Horn - horizontal coverage 80° / 120°

The VERA10 loudspeaker can be equipped with either an 80° × 10° horn or a 120° × 10° horn. The degrees refer to the horizontal and vertical radiation angles. The VERA10 horn variant can be identified by the legend printed on the horn (see figure 2.2).

The horn can be exchanged for the other type at any time. See section 4.2 „Exchanging the horn“.

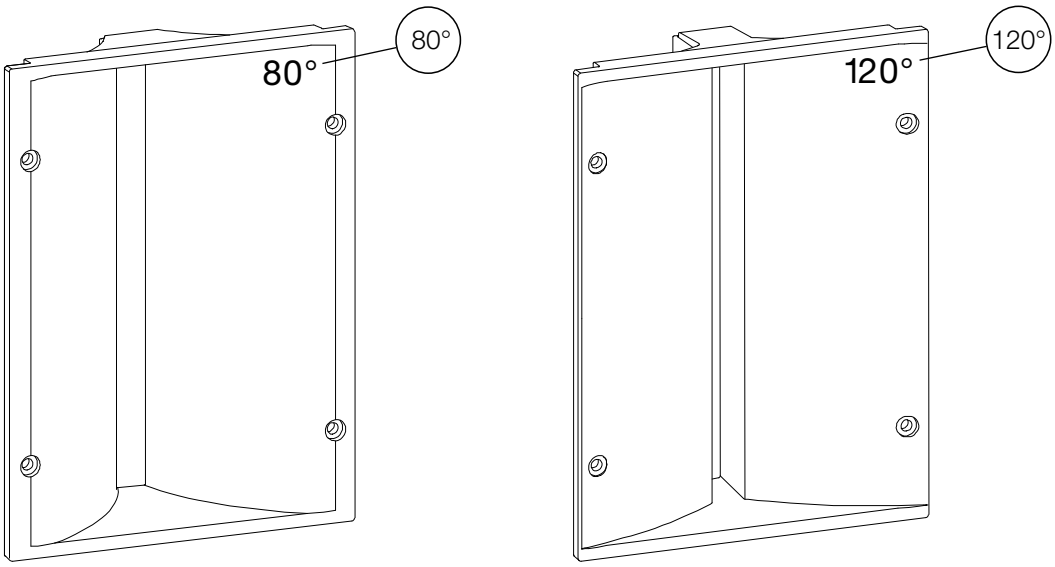

Figure 2.2 - VERA10 horn variants

2.2.2 VERA10A / VERA10P models

The standard model of the VERA10 loudspeaker is the VERA10A, which can only be operated in the „biamped“ mode. It is supplied with a standard connection panel and requires two amplifier channels for operation. The compression driver and cone driver are separated by the DSP of the amplifier.

The VERA10P model can additionally be switched to the „passive“ mode. This enables operation with only one amplifier channel, for which the enclosure contains a passive crossover. The built-in passive crossover features two selector switches described in section 2.3.

2.3 Operating modes

The passive version (VERA10P) features two selector switches on the rear (figure 2.3.1 and 2.3.2) for switching between two different operating modes and for attenuating the high frequency range (see figure 2.1, no. 16).

2.3.1 Horizontal selector switch

In the „PASSIVE“ mode, the loudspeaker is operated on a passive audio crossover with a single amplifier channel.

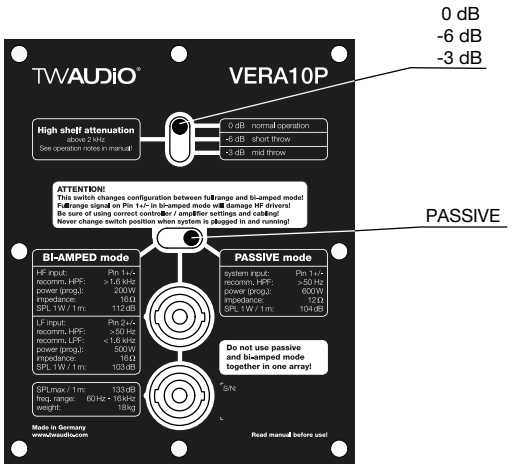

Figure 2.3.1.1 - Operating mode „PASSIVE“

In the „BIAMP“ mode, the internal passive crossover bypasses the signal path and the individual routes of the loudspeaker must be driven separately by two DSP channels.

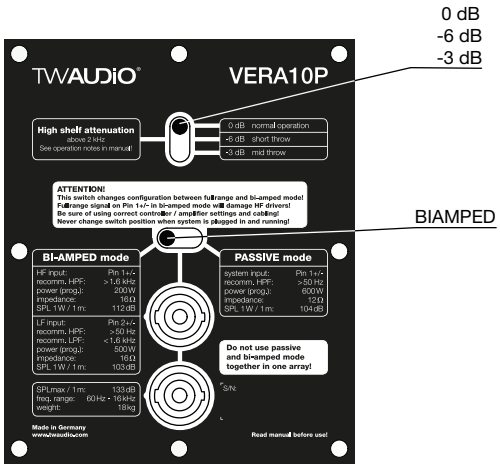

Figure 2.3.1.2 - Operating mode „BIAMPED“

NOTE

Never change the operating mode while the loudspeaker is connected. In addition to setting the switch, the corresponding preset on the amplifier must be changed.

Using a wrong, out dated or a preset not provided by TW AUDiO can lead to destruction of the speaker.

2.3.2 Vertical selector switch

The „High shelf attenuation“ vertical selector switch lowers the frequency range above 2 kHz independent of the VERA10P operating mode.

In the „0 dB normal operation“ mode, the frequency response is not attenuated above 2 kHz.

In the „-6 dB short throw“ mode, the frequency response above 2 kHz is attenuated by 6 dB.

In the „-3 dB mid throw“ mode, the frequency response above 2 kHz is attenuated by 3 dB.

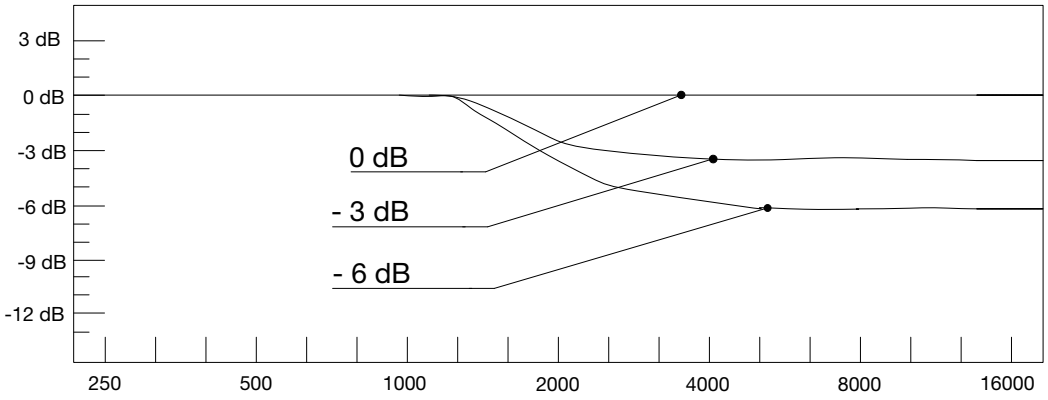

Figure 2.3.2 - High frequency range attenuation

3. Technical data

3.1 Data sheet

	Variant		
	VERA10A	VERA10P	
Component	1x 10“ LF / 2x 1“ HF		
Frequency response	60 - 16000 Hz		
Power handling (program/peak)	500 / 1000 W LF 200 / 400 W HF	BIAMP Mode	PASSIVE Mode
		500 / 1000 W LF 200 / 400 W HF	600 / 1200 W
Impedance	16 Ω LF 16 Ω HF	16 Ω LF 16 Ω HF	12 Ω
Coverage (h x v)	80° x 10° or 120° x 10° HF-horn		
Max. SPL / 1 m	133 dB		
Dimensions (h x w x d)	275 x 500 x 355 mm [10,83 x 19,69 x 13,98 in]		
Weight	16 kg [35,3 lbs]	18 kg [39,7 lbs]	
Finish	Polyurea-coating		

3.2 Wiring diagram

3.2.1 Variant: VERA10A

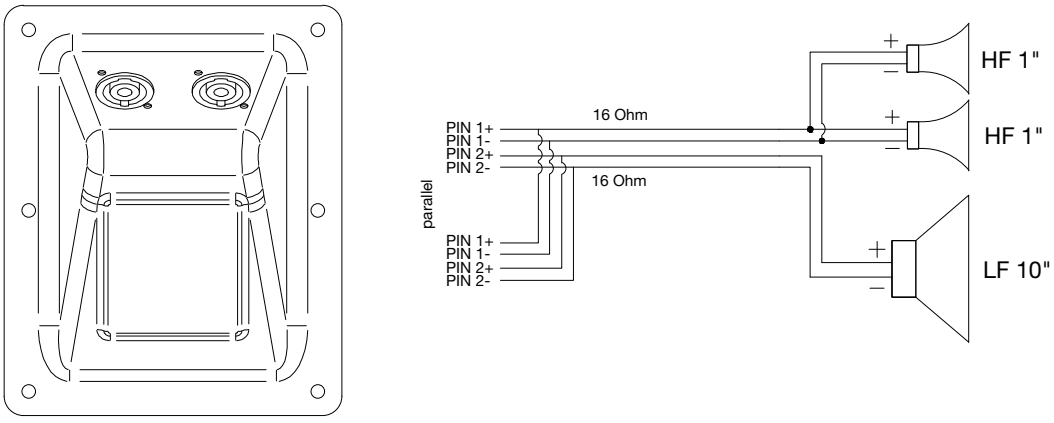

Figure 3.2.1 - Wiring diagram VERA10A

3.2.2 Variant: VERA10P

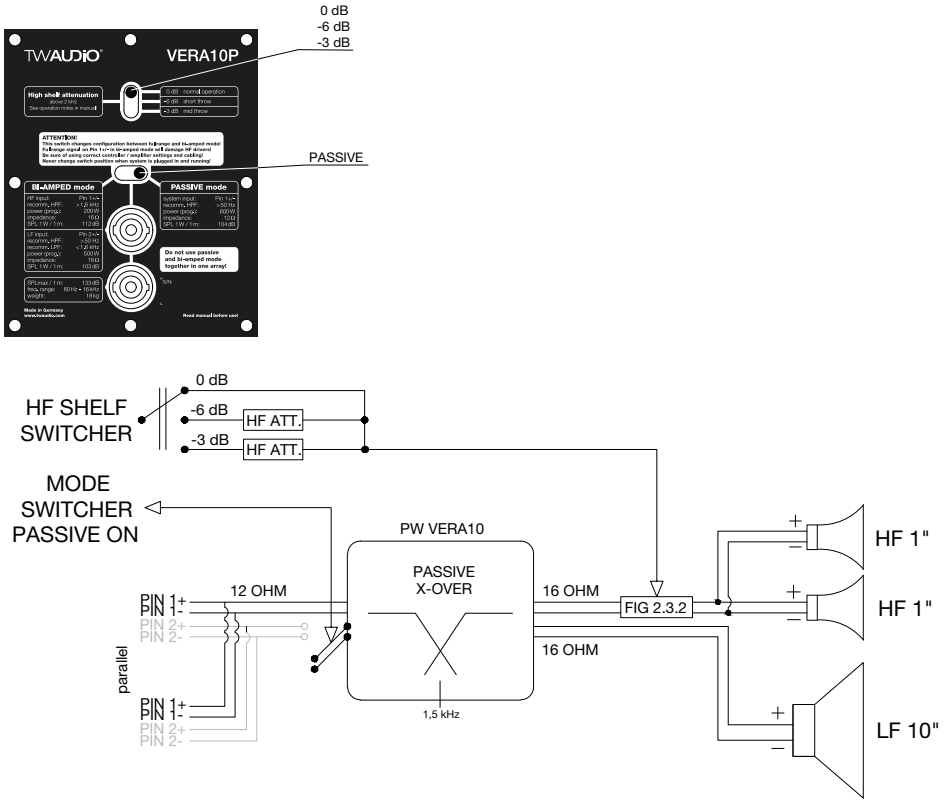

Figure 3.2.2.1 - Wiring diagram VERA10P - PASSIVE Mode

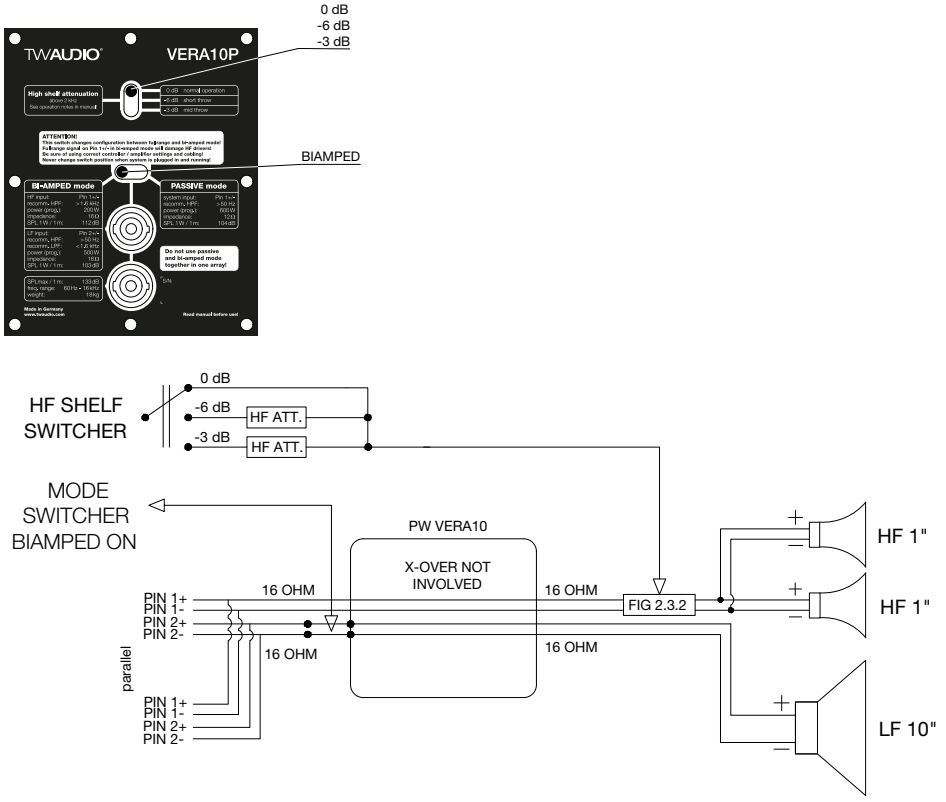

Figure 3.2.2.2 - Wiring diagram VERA10P - BIAMPED Mode

4. Commissioning

4.1 Setup

The VERA10 loudspeaker has been designed for horizontal operation in stacked and flown vertical arrays. TW AUDiO provides a wide range of accessories to securely attach the loudspeaker.

WARNING

Make sure that all system structures are located on a firm, level surface and that the surface can bear the total weight!

WARNING

Make sure the speakers are securely fastened to prevent personal injury and property damage. Secure stacked loudspeakers properly so that they can be tipped by 10° in any direction without toppling.

NOTE

TW AUDiO recommends using only the accessories specified by TW AUDiO for securing and mounting loudspeakers.

4.2 Exchanging the horn

Depending on the variant, either the 80° × 10° or the 120° × 10° horn (see section 2.2.1) is built into the VERA10 loudspeaker. For some applications, it may be advantageous to exchange the horn for the other variant in order to change the horizontal coverage. Proceed as follows.

1. Place the VERA10 loudspeaker on its back with the front grill facing up. Ensure that you are working on a clean and non-slip surface. To secure the speaker against lifting and slipping, ask a second person for assistance.
2. To remove the front grill a 3 mm hex key is required. Use it to remove the four mounting screws on the left and right side of the speaker enclosure. (two on every side).
3. Release the four screws of the horn using a 3 mm hex key.
4. Pull the horn upward out of the loudspeaker enclosure.
5. Check that the sealing lip between the waveguide and horn is properly seated.
6. Insert the new horn in the opening. Screw it onto the enclosure using mediumstrength thread locker.
7. Screw the front grill back on.

4.3 Operation

Operation of the VERA10A speaker requires a DSP-Controller. For this purpose, only presets developed by TW AUDiO are recommended. The TW AUDiO system racks are ideally suited for this purpose.

NOTE

Before connecting the loudspeaker to the amplifier, ensure that the right preset has been loaded.

Using a wrong, out dated or a preset not provided by TW AUDiO can lead to destruction of the speaker.

NOTE

Make sure that the amplifier's specifications meet the requirements. Using an amplifier that doesn't meet the specifications can destroy the loudspeaker.

Please note the technical data in section 3.1 on page 11.

4.4 Connecting the cable

To create a cable connection with an amplifier rack from TW AUDiO, proceed as follows.

NOTE

Ensure that the cable cross sectional area is sufficient (at least 1.5 mm^2) to avoid power losses. TW AUDiO recommends using the loudspeaker cables available from TW AUDiO.

When connecting the cables to the loudspeaker, ensure that polarity (+/-) and pin assignment (1/2) are correct. Incorrect connection can lead to a significant change in the loudspeaker's sound characteristics and may damage the driver.

The pin connections of the VERA10 loudspeaker can be found in section 3.2 ("Connection diagram") on page 11 and 12.

The internal wiring of the VERA10 loudspeaker allows for parallel connection of multiple loudspeaker units.

Please note that parallel connections will decrease the total impedance of your loudspeaker configuration.

The total impedance and the resulting power of the speaker configuration must match the output power of the amplifier.

5. Transport and storage

To transport the unit with a single person, TW AUDiO recommends using the VERA DL10 dolly. Alternatively, the VERA10 can also be transported in the CaseVERA10 flight case.

When transporting and storing the unit, it is important to ensure that the surface and front grill of the loudspeaker are not damaged. Moisture can penetrate through exposed wood surfaces and cause the wood to swell. A bent or broken front grill will no longer adequately protect the sensitive speaker membranes.

In addition, appreciable dust deposits may considerably impair the functionality of a loudspeaker membrane. For this reason, the loudspeakers should be transported and stored in a safe, careful, dry and largely dust-free manner.

The following accessory parts for transport and storage are available from TW AUDiO:

- VERA DL10 (dolly for up to 12 VERA10)
- CaseVERA10 (flight case for 2x 2 VERA10 elements)

The original packaging is unsuitable as permanent storage and transport packaging.

6. CE Conformity Declaration

Copy and translation of the original CE Conformity Declaration:

We hereby declare that the below-referenced components by virtue of their design and construction, and in the configuration placed on the market by us, satisfy the safety and health requirements of the applicable EC directives. This declaration becomes invalid in case of modifications that have not been approved by us.

This declaration applies to the following components

- VERA10A-80
- VERA10A-120
- VERA10P-80
- VERA10P-120

as well as all model variants based on these, provided that they correspond to the original factory models and have not been technically modified in any way.

Applicable directives:

- 2001/95/EG
- 2011/65/EU

Applicable national standards and technical specifications:

- DIN EN 18800
- DIN EN ISO 12100
- DGUV Vorschrift 17 und 18
- EN 50581: 2013-02

Berlin, Germany, January 1st, 2021

Bernhard Wüstner

7. Disposal

It is prohibited to dispose of used electrical equipment with household refuse.

All TW AUDiO INTERNATIONAL GmbH products are so-called B2B-products. This means that they are

symbol shown here may only be disposed of by TW AUDiO.

The loudspeaker owner is legally responsible for proper disposal of used devices that do not bear this symbol. This pertains to all products delivered prior to March 29, 2010. Nevertheless, TW AUDiO will also be happy to assist you in this case.

If you have any question regarding the disposal of used devices, please contact us under the following telephone number:

+49 (0) 71 41 - 48 89 89 0

Thus, TW AUDiO is in strict compliance with the Waste Electrical and Electronic Equipment Directive (2012/19/EU) for the protection of our environment.

TW AUDiO is registered under the following WEEE-reg.-no. with the German National Register EAR as a B2B-manufacturer and distributor of electrical devices:

DE93295191

In countries outside of the European Union, comply with local regulations.

TW AUDiO INTERNATIONAL GmbH
Osterholzallee 140-2
71636 Ludwigsburg (Germany)

Phone: + 49 (0) 71 41-48 89 89 0
Fax: + 49 (0) 71 41-48 89 89 99
E-Mail: info@twaudio.de
WWW: www.twaudio.de