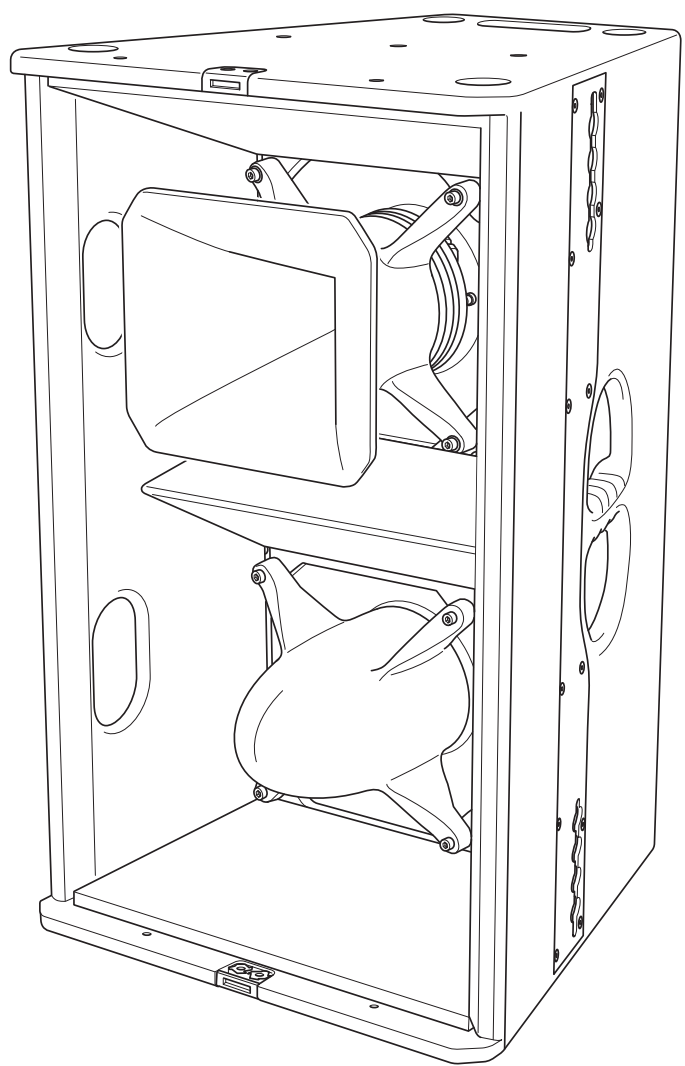


T24N | Operating Manual



Introduction

Thank you for choosing a high quality product "MADE IN GERMANY" from TW AUDIO.

The T24 was the first TW AUDIO loudspeaker and a benchmark for almost ten years for numerous users in the live and installations market. The innovative $2 \times 12"/1.4"$ horn in horn construction enables an outstanding dynamic and 143 db top acoustic pressure with an enclosure front surface of just 70×40 cm. In 2014 a substantial upgrade followed with the T24N.

Good just got better – and lighter. The specifically developed 12" neodymium chassis together with the new enclosure construction make the horn loaded loudspeaker full range capable just under 70 Hz. The new 1.4" mid high range driver with a 3" titanium membrane reproduces silky highs exact and free of distortion even on the highest levels. The standard fitted $60^\circ \times 40^\circ$ horn can be, without the use of tools, exchanged for a $90^\circ \times 50^\circ$ horn.

If you lend your product to another party, inform that party of the safety-related operating procedures and hand over this operating manual. If you require additional copies of this operating manual, they can be obtained free of charge from TW AUDIO at any time.

Instructions in the operating 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 setting up the device, read the operating manual carefully and keep this document in a safe place together with the T24N loudspeaker.

General information

Operating manual: OM-T24N
Version 1.1 en, 09/2016
© by TW AUDiO 2015; 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 make changes that take into account the latest engineering advancements.

TW AUDiO is pleased to receive suggestions for improvement and recommendations on this operating manual. Please send us any feedback you may have to the following e-mail address.

info@twaudio.de

TW AUDiO GmbH
Osterholzallee 140-2
71636 Ludwigsburg, Germany

Telephone: +49 (0) 71 41 - 48 89 89 0
Telefax: +49 (0) 71 41 - 48 89 89 99

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1. Safety | Intended use

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

The T24N loudspeaker was developed for professional use in 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.

TW AUDiO shall not be liable for any damage that ensues from unintended use.



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.



When working with heavy loads over 20 kg [44,09 lbs], use suitable aids (dollies, hoisting slings, etc.). Multiple people 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.



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

- Direct sunlight
- Moisture
- Jolting
- Dust



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 approx. 90 dB SPL can lead to long-term hearing impairment.



Avoid:

- Feedback
- Distorted signals (clipping)
- Peaks that result when devices are switched on or hot plugged and unplugged.

These signals can result in overloading of the loudspeaker.



Ensure that the loudspeaker is not exposed to permanent thermal overloads. This 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 data carriers, EC cards and CRT displays. A distance of approx. one meter is sufficient to avoid damage.



Check loudspeakers and accessory parts regularly for visible wear. This is essential to ensure fault-free operation on a permanent basis. Replace worn parts promptly. Spare parts can be obtained from TW AUDiO.

2. Overview

2.1 Components

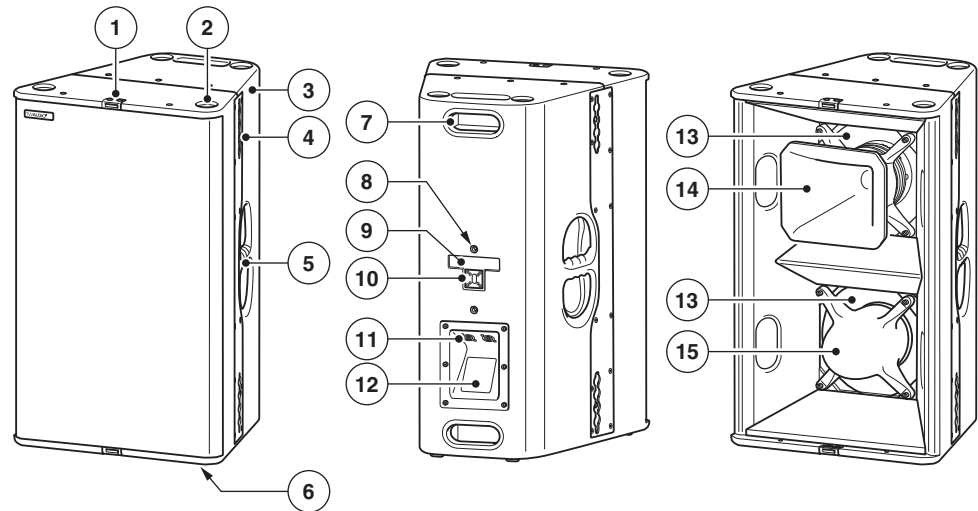


Figure 2.1 - Overview

1. Dolly latch base to attach the TW AUDiO T24N front dolly
2. Milling for rubberfeet for safely stacking loudspeakers
3. 15 mm multiplex housing – Warnex texture paint surface finish
4. Rigging plate for attaching accessory parts
5. Ergonomic carrying handles (left and right)
6. Rubber feet (4 pieces)
7. Handles (top and bottom)
8. M10 threaded insert for attaching accessory parts
9. Warning label
10. Switch for operating mode (passive, biamp)
11. Standard connection panel with two speakON® connectors
12. Type label
13. 12" cone drivers
14. Interchangeable horn with 1.4" compression driver
15. Phase plug

2.2 Variants

The T24N loudspeaker is available in a $60^\circ \times 40^\circ$ variant and in a $90^\circ \times 50^\circ$ variant. The specified degree values refer to the horizontal and vertical radiation characteristics of the horn. Different interchangeable horn cones can be installed for this purpose. The variant of the T24N loudspeaker can be identified on the outside of the horn cone (see figure 2.2).

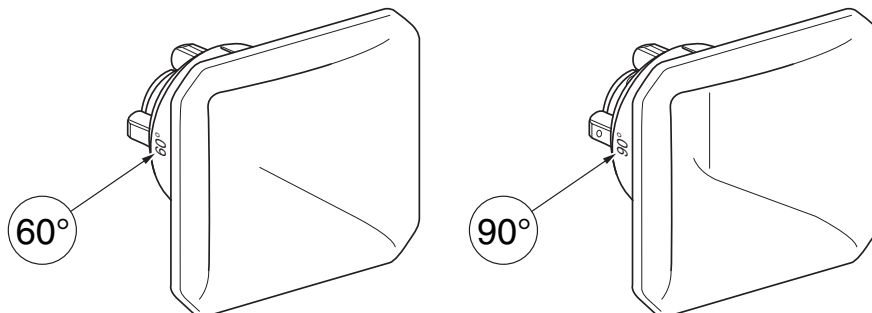


Figure 2.2 - Variants of the T24N horn cone



TIPP

The modular design of the high frequency unit allows a quick change between the different characteristics of dispersion.

The entire high frequency unit consists of the horn cone (1), the horn base (2), the driver plate (3) and the compression driver (4).

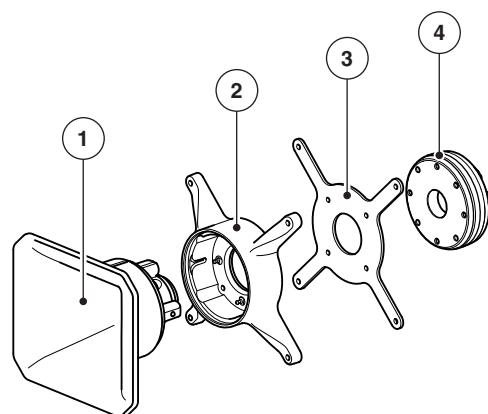


Figure 2.3 - High frequency unit

2.3 Operating modes

The T24N loudspeaker has a switch (see figure 2.4) on the back for switching between two different operating modes (see figure 2.1, no. 10).

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

In the "BIAMP" mode, the internal passive crossover is being by-passed, therefore the low-frequency section (2x12") and high-frequency (1x1,4") section must be driven separately by individual processed amplifier channels.

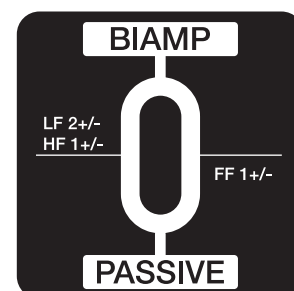


Figure 2.4



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.

Operating with an incorrect preset can damage parts of the loudspeaker.

3. Technical data

3.1 Data sheet

	Operating mode	
	Biamp	Passive
Components	2 × 12" LF/1 × 1.4" HF	
Frequency response	65 – 18,000 Hz	
Power handling, program/peak	1400/2800 W LF 220/440 W HF	1400/2800 W
Impedance	4Ω LF 8Ω HF	4Ω
Coverage angles (h × v)	60° × 40° or 90° × 50°	
Max. SPL/1 m	143 dB	
Dimensions (h × w × d)	706 × 440 × 440 mm [27,80 × 17,32 × 17,32 in]	
Weight	33.1 kg [72,9 lbs]	
Finish	Warnex texture paint	

3.2 Wiring diagram

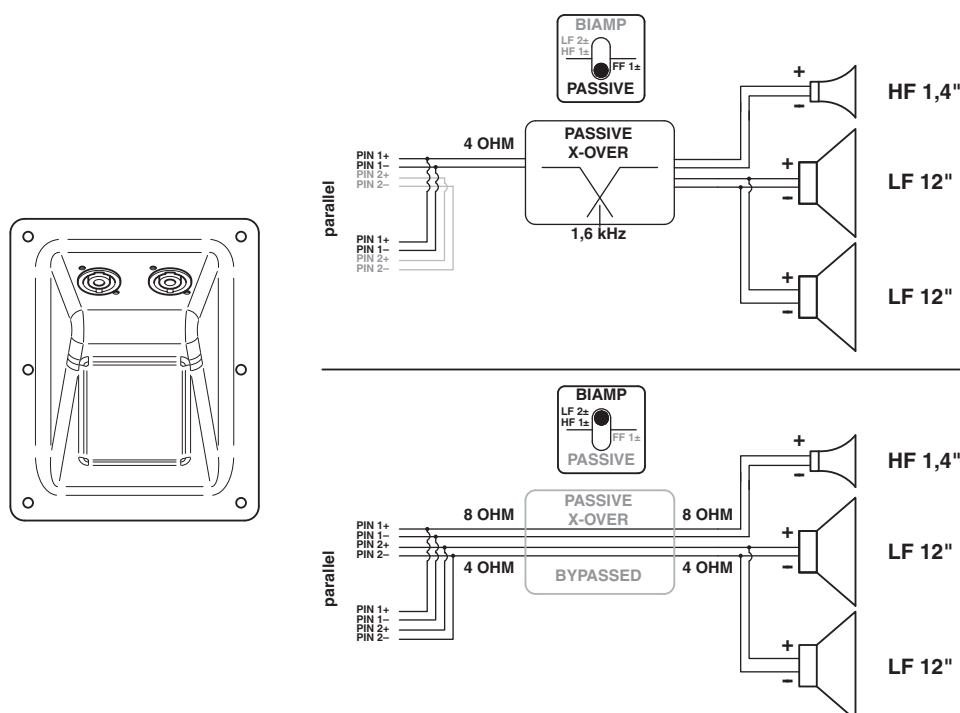


Figure 3.2 - Wiring diagram

4. Setting up the loudspeaker

4.1 Setup



Ensure that the loudspeakers are in a stable position to prevent personal injury and property damage. Secure stacked loudspeakers properly so that they can be tipped by 10° in any direction without toppling. Ensure that no thoroughfares are crossed when laying loudspeaker cables. Use cable protectors or similar if necessary.



TW AUDiO recommends using only the accessories specified by TW AUDiO to secure the loudspeakers.

The T24N loudspeaker is designed for upright operation. A variety of accessories is available from TW AUDiO to securely attach the loudspeaker, e.g. on stands or suspended from trusses and motor lifts. Horizontal operation is not an intended use.

4.2 Rotating the horn and exchanging the horn cone

The horn of the T24N loudspeaker is positioned such that the horizontal coverage is 60° and the vertical coverage is 40°. In some situations, it may be advantageous to change the output characteristics of the high-frequency range. For this purpose, you can rotate the horn together with driver or exchange the horn itself into 90° × 50° variant. Proceed as follows.

4.2.1 Rotating the horn

1. Place the T24N loudspeaker on the back side with front grill facing up. Ensure that you work on a clean and non-slip surface.
2. To remove the front grill of the loudspeaker, use a 3-mm hex key. Remove the four screws on the top and bottom of the loudspeaker enclosure (two on each side).
3. Pull the horn cone up and out of the horn base.
4. Unplug the black connector from the enclosure.
5. Release the fixing screws of the horn base.



6. Rotate the horn base by 90°. Ensure that you hold onto it firmly at all times. This will prevent damage to the woofer membrane. Now tighten the horn base again. For this purpose, use a 6-Nm torque wrench.



7. Plug the black connector back in. Ensure that the cable connection of the driver does not touch the membrane of the woofer. Otherwise, this component could be damaged.
8. Insert the horn cone back in the horn base. To do so, firmly push the horn cone to enable the catch mechanism to engage in the horn base. Then check that the horn cone is firmly seated in the horn base.
9. Screw the front grill back on hand-tight.

4.2.2 Exchanging the horn cone

1. Place the T24N loudspeaker on the back side with front grill facing up. Ensure that you work on a clean and non-slip surface.
2. To remove the front grill of the loudspeaker, use a 3-mm hex key. Remove the four fixing screws on the top and bottom of the loudspeaker housing.
3. Pull the horn cone up and out of the horn base.
4. Insert the other horn cone back in the horn base. To do so, firmly push the horn cone to enable the catch mechanism to engage in the horn base. Then check that the horn cone is firmly seated in the horn base.
5. Screw the front grill back on hand-tight.

4.3 Connecting cables

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



Ensure that the cable cross section is sufficiently large (at least 2.5 mm²) to avoid power losses. TW AUDiO recommends using the loudspeaker cables available from TW AUDiO.

Ensure that the polarity (+/-) and pin connection (1/2) of the cables are correct. An error here will result in a significant change in the loudspeaker sound characteristics and may damage the compression driver.

The connection assignment of the T24N loudspeaker can be found in section 3.2 "Wiring diagram" on page 5.

The two speakON NL4 connectors on the back side of T24N allows to link multiple T24Ns on a single amplifier output. Note that parallel connection reduces the total impedance seen by the amplifier.

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

4.4 Operation

A T24N loudspeaker can only be operated with a DSP controller. TW AUDiO only recommends using presets developed by TW AUDiO. The TW AUDiO system racks are ideal for this purpose.



Ensure that the preset that matches the chosen operating mode (see section 2.3) is recalled before connecting the loudspeaker to the amplifier.

Operating with an incorrect preset can damage parts of loudspeaker.



Ensure that the amplifier is properly sized according to requirements. Undersizing or oversizing may damage the loudspeaker.

Please note the technical data in section 3.1.

5. Transport and storage

Because the T24N loudspeaker weighs over 20 kg [44,09 lbs], two people are needed to move and transport the unit.



The FDB30 front dolly and the Twin Case can be used to transport the T24N loudspeaker by a single person.

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 prevent the loudspeaker membrane from working properly. 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:

- CaseT24 (flightcase for two T24N)
- CoverT24 (protective cover)
- FDB30 (front dolly)

The original packaging is not suited for permanent storing and transporting.

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:

- T24N-60
- T24N-90

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/EC
- 2011/65/EU

Applicable national standards and technical specifications:

- DIN 18800
- DIN 4113
- DIN EN ISO 14121-1
- BGV C1/BGI 810-3
- EN 50581:2012

Ludwigsburg, Germany, 01 April 2014

Tobias Wüstner

7. Disposal

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



All products of TW AUDiO GmbH are so-called B2B products. This means that they are sold by a commercial business to a commercial business. TW AUDiO products that bear the trash can symbol shown here are only permitted to be disposed of by TW AUDiO.

The loudspeaker owner is legally responsible for the disposal of used devices that do not bear this symbol. This pertains to all products delivered prior to 29 March 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 as a manufacturer and distributor of electric devices under the following WEEE registration number with the German registry office EAR as a B2B manufacturer:

DE54488702

In countries outside of the European Union, follow the local regulations.

TWAUDiO GmbH
Osterholzallee 140-2
71636 Ludwigsburg
Germany

P: + 49 (0) 71 41-48 89 89 0
F: + 49 (0) 71 41-48 89 89 99
E: info@twaudio.de
W: www.twaudio.de