

LINEA LC

DESIGNLAUTSPRECHER FÜR HÖCHSTE
SPRACHVERSTÄNDLICHKEIT.



LINEA LC

LC-20 / LC-60 / LC-100 / LC-150 / LC-220

BEDIENUNGSANLEITUNG | USER MANUAL

Bitte lesen Sie vor Inbetriebnahme des Gerätes die Bedienungsanleitung sorgfältig durch und bewahren Sie sie auf.
Please read this manual carefully before operating the equipment and keep it for the future reference.

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1. IMPORTANT SAFETY INFORMATION

Please read the following safety information carefully before using the system. This information should be kept handy for future reference. Reading this manual does not replace the need for awareness and observation of all current local safety regulations, legal requirements and compliance with safe working methods at the venue.

The following information and technical specifications have been based on data that was available at the time of publication. We expressly reserve the right to make changes as necessary.

MARKINGS AND DEFINITIONS

⚠ DANGER

This term is used to denote high-risk hazards which, if not prevented, can result in death or serious injury.

⚠ WARNING

This term is used to denote medium-risk hazards which, if not prevented, can result in death or serious injury.

⚠ CAUTION

This term is used to denote low-risk hazards which, if not prevented, can result in minor or moderate injury.

⚠ DANGER

To avoid risk of injury or death, please make sure that anyone involved in installing, operating or dismantling the system has read this user manual.

⚠ WARNING

To prevent any potential injury caused by the system falling down,

- it must be firmly fixed to building structures according to the mounting instructions. Please also ensure that these structures combined with the equipment used for system deployment have sufficient load-bearing capability and are structurally suitable. Only use the recommended **FOHNN** accessories with this product, or other components that have been explicitly specified in this manual.
- it must be regularly checked for any signs of wear or loosened parts on load bearing connections.

To minimize the risk of fire or electric shock,

- the system should not be opened: It does not contain any parts to be maintained by the user. For maintenance requirements, please consult a qualified technician.
- items that have a naked flame (such as candles) should not be placed near the system.

To avoid injury, this product must be taken out of operation, appropriately marked and secured against unauthorised use if

- it shows any visible signs of damage.
- there is any indication of loose parts.
- it does not work properly.
- it has been subjected to poor transportation conditions (e.g. with unsuitable packaging).

To avoid injury

- this product must not be stored, installed or operated in reach of children.

To prevent hearing damage caused by excessive sound pressure levels, do not

- stand directly in front of a loudspeaker, that is ready for operation, without wearing ear protection.
- subject yourself to high sound pressure levels over a long time period.

⚠ CAUTION

To prevent damage to the product, please avoid the following:

- acoustic feedback
- high powered, permanently distorted signals

1.1 CONNECTIONS AND CABLING

Cables form the vital links between the different components in an audio system.

Please make sure that your cables are in perfect working order. Only use branded cables of an appropriate cross section!

Speaker cables must be laid and secured in a way that they cannot be harmed by tools or jammed and damaged by the loudspeaker or wall brackets.

Wiring of loudspeaker must be solely executed by skilled personnel. We recommend using ferrules for stranded wires.

Avoid excessive torque to the terminal screws!

2. INTRODUCTION

Congratulations on purchasing a **FOHNN® LC** loudspeaker system. **LC** loudspeakers are passive, weatherproof line source systems with aluminium housing, specially designed for use in fixed installations where the highest demands for speech intelligibility and visual appearance must be met. They are equally suited to indoor or outdoor use.

LEN loudspeaker systems feature two-way technology with integrated passive filters that guarantee an even dispersion and the best possible coverage. An integrated **FOHNN SOURCE DIVISION WAVEGUIDE** effectively suppresses side lobes, resulting in improved speech intelligibility for acoustically challenging venues with long reverberation times, such as railway stations, airports, auditoria and conference halls.

2.1 INTENDED READERS OF THIS MANUAL

This user manual outlines the operation and potential applications of the **LINEA LC** loudspeaker. The information is aimed at system technicians, users and anyone else involved in setting up, operating and dismantling the system.

2.2 SCOPE OF SUPPLY

All **FOHNN** products are developed by qualified engineers. During the build process, current safety regulations are always kept in mind. Each product is thoroughly tested before leaving the factory.

Please examine your new product carefully for any signs of damage that may have occurred during transportation and, if necessary, inform your dealer and the transport company immediately. Please also check that the packaging includes all components belonging to the product.

Your **LINEA LC** system contains the following components:

- 1 × LC-20 / LC-60 / LC-100 / LC-150 / LC-220**
 - 1 × quick start guide**
 - 1 × cover plate**
(including 2 x cable glands & dummy plugs)
-

If anything is missing, please let your **FOHNN** dealer know immediately.

2.3 UNPACKING THE PRODUCT

When unpacking the system, we recommend proceeding as follows.

1. Open the packaging and take out the product.
2. Check the product carefully for any signs of damage during transportation.

If any is found, please notify the transport company immediately. Re-compense for damage during transportation can only be claimed by the consignee i.e. you. Please retain all packaging for examination by the transport company.

3. The packaging should ideally be kept in any case, as products should never be returned without their original packaging.

3. SETUP AND OPERATION

3.1 INSTALLATION AND MOUNTING

Depending on the particular model, **LC** loudspeakers can be mounted on building structures using the following wall brackets (see Chapter 5 "Accessories"):

WAL-1, WAL-03, WLX-100, WLX-221

Loudspeaker mounting within buildings should only be carried out by trained personnel.

Please ensure that the wall brackets you have selected are suitable for use with the product to be installed.

We recommend that you read Chapters 1 and 2 of this user manual carefully. You must also observe any relevant national safety requirements.

CONNECTION TO BUILDING STRUCTURES

- Make sure that the building structure to which the loudspeaker will be connected is statically suitable.
- Surfaces that support brackets must be sufficiently stable and not be subject to long-term settlement.
- Wall plug and screw connections must be of sufficient size to cope with the tensile strength required. This will also depend on the type and inclination of the particular speaker mounting.
- If you are uncertain about any of the above points, it is imperative to consult a qualified structural engineer.

CONNECTIONS BETWEEN LOUDSPEAKERS AND BRACKETS

- All **FOHNN** brackets include fastening materials for connecting them to the loudspeaker. If you want to use other screws, their strength must be at least class 8.8; this corresponds to a tensile strength of 800 N/mm^2 and a 0.2 % proof stress of 640 N/mm^2 .
- Never use screws that are longer than the originals supplied. This could damage structures inside the loudspeaker, or cause a short circuit.
- When connecting the following brackets to **LC** series loudspeakers, a tightening torque of 10 Nm is required: **WAL-1, WAL-03, WLX-100, WLX-221**. This applies to standardised screws without washers: DIN 912/6912, DIN 931/933, ISO 7380.

SAFETY

- Regardless of any currently applicable legal requirements, we strongly recommend securing all systems to a second separate point. Any M6 thread points on **LC** loudspeakers are suitable for this purpose. The two sets of threads above the connection panel and on the upper end of the housing rear wall are specifically intended for this.
- DIN 580 C15 forged eyelets can be used for anchoring the system. [SEE FIGURE 1.](#)
- To secure the loudspeaker, only suitably sized permitted elements (such as wire ropes, shackles or quick links) should be used. The maximum falling distance, before the safety element is engaged, should be as small as possible and must not exceed 200 mm.

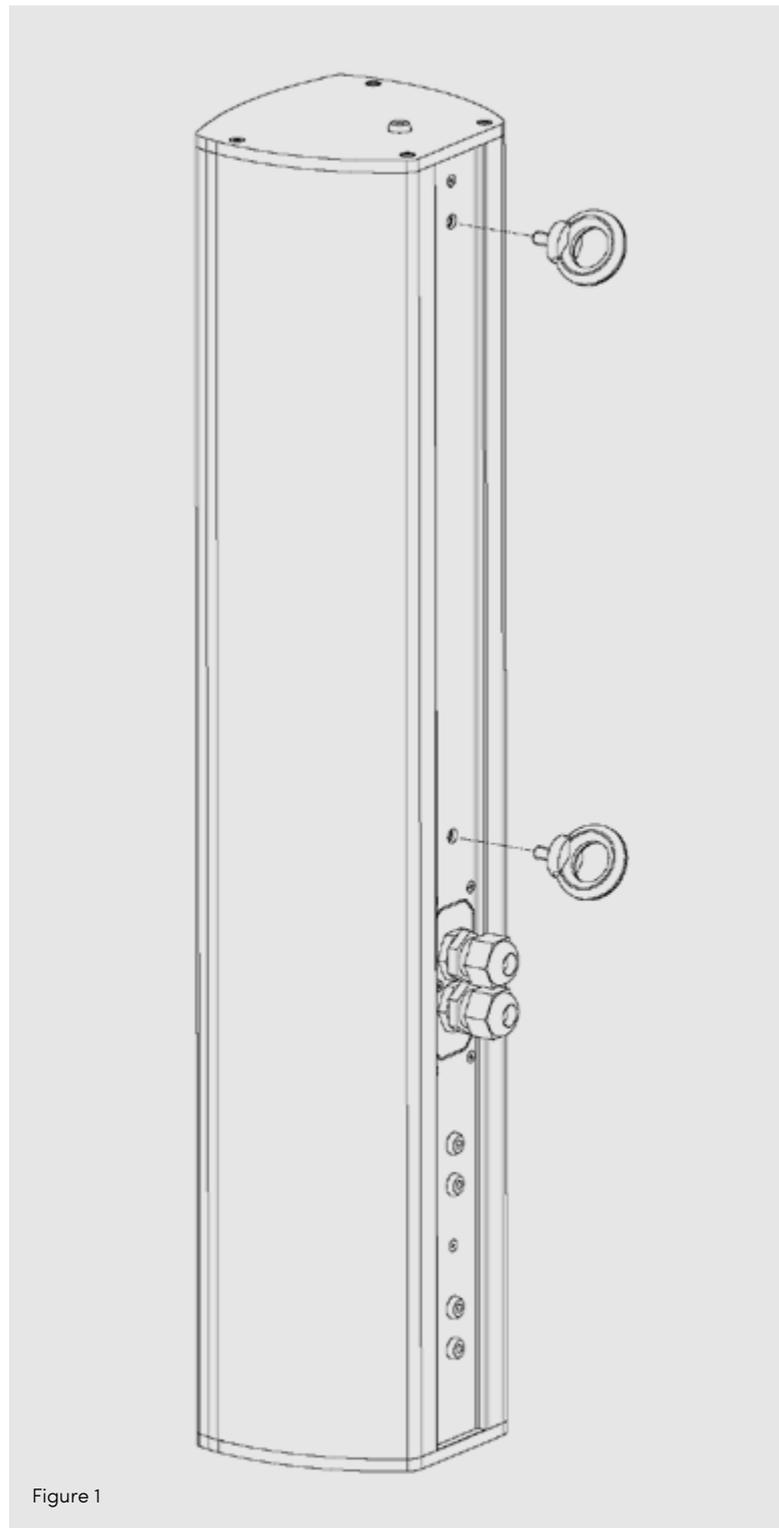


Figure 1

- When anchoring the system to the wall, dynamic strength caused by the falling loudspeaker must also be considered.

MOUNTING WITH WAL-1 BRACKETS

1. Remove the two oval-head screws from the top and base of the loudspeaker.
SEE FIGURE 2.
2. Fix both **WAL-1** brackets to the wall using two screws and wall plugs in each case. The loudspeaker itself serves as the best distance gauge.

When mounting the longer **LC-150** and **LC-220** loudspeakers models, it makes sense to fix the lower bracket first and determine the position of the top bracket using the actual loudspeaker.

Allow play of ca. 2 mm between the loudspeaker and the bracket.

3. It is advisable to affix the supplied rubber washers around the drill holes on the top and bottom surfaces of the speaker. This will prevent the powder coating from becoming scratched.
SEE FIGURE 3.
4. Slide the loudspeaker between the two brackets.
5. Screw the brackets to the loudspeaker using the supplied M6x25 screws and washers. Do not tighten the screws at this point.

Apply medium-strength thread lock fluid to both screws beforehand.

6. Adjust the loudspeaker then firmly tighten both screws according to the required torque.

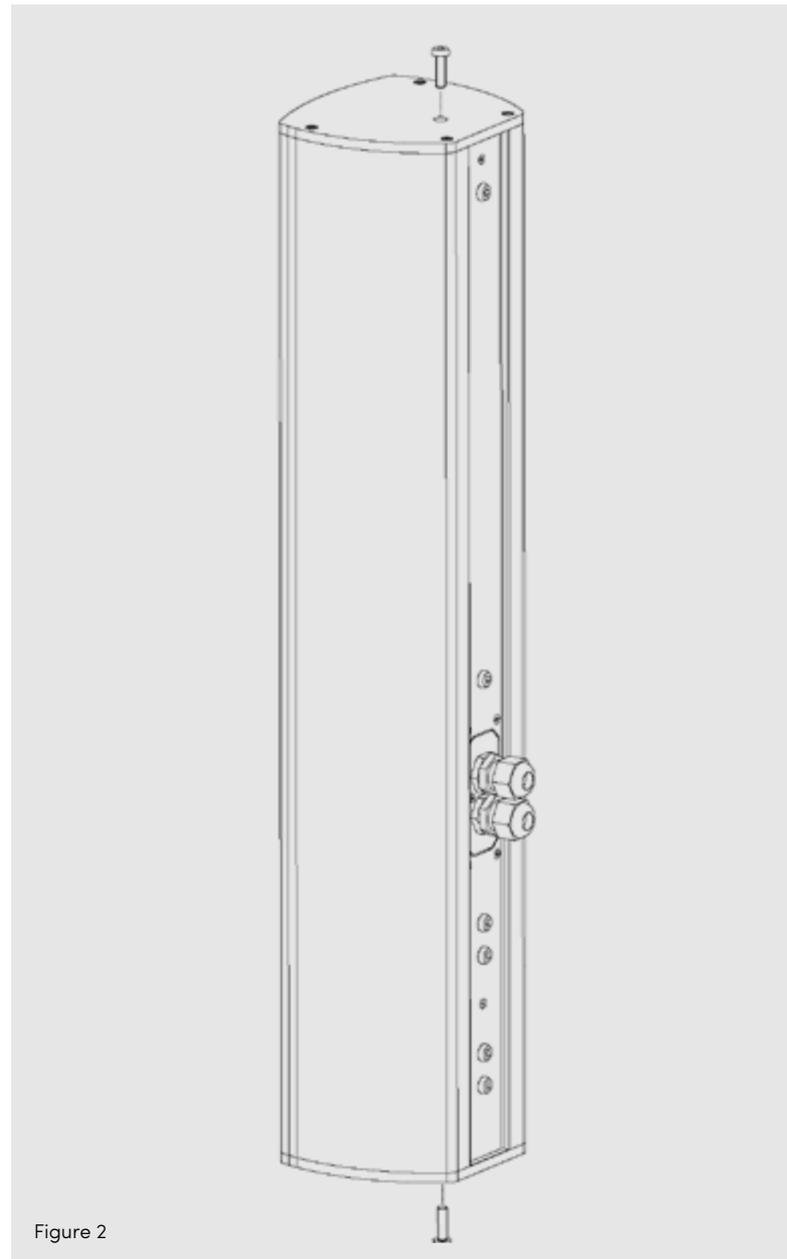


Figure 2

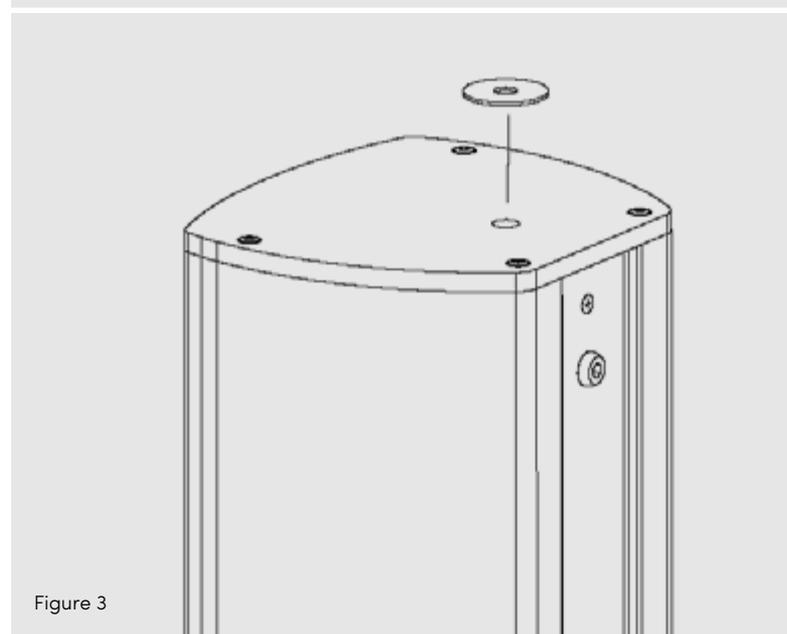


Figure 3

MOUNTING WITH WLX-100 / WLX-221 WALL BRACKETS

1. Remove both oval-head screws M6 (D) at the mounting plate and loosen the screws (C, F, G) by about three turns. Remove the mounting plate from the wall bracket. **SEE FIGURE 4.**
2. Remove the four to six M6 oval-head screws that are located underneath the connector panel. **SEE FIGURE 5.**
3. Fix the loudspeaker to the **WLX-100/WLX-221** mounting plate. Apply medium-strength thread lock fluid to all screws. On both brackets, use four of the locking screws you just removed. Tighten all screws according to the required torque. **SEE FIGURE 6.**
4. Fix the **WLX-100** or **WLX-221** to the building structure using two screws and wall plugs. To do this, you will need to disassemble the mounting bracket from the wall bracket. During installation, don't forget to place the two tooth-lock washers (A) between the mounting bracket and the wall bracket. Make sure that the wall bracket is mounted with the horizontal slot facing upward. **SEE FIGURE 7.**
5. Put the mounting bracket in a roughly vertical position by turning the adjustment spindle (B) to the right.
6. Place the loudspeaker and its mounting plate on the wall bracket. Both sides of the mounting plate must be resting on the screw (C). **SEE FIGURE 8.**
7. At this point the fixing screws (D) can be fitted and tightened with a torque of 8-10 Nm. There are two options here: If the front holes (20) are to be used, this will result in an adjustment angle of 0-20°; if the rear holes (30) are used, this will result in an adjustment angle of 10-30°.
8. Set up the required inclination angle by turning the adjustment spindle (B) to the left. If you need to reduce the angle again, turn the spindle back while pushing the speaker slightly up towards the wall bracket and thus releasing the spindle.
9. Loosen the clamping screws (E) on the horizontal axis and turn the loudspeaker to its required position.
10. Once you are happy with the loudspeaker's angle and rotation, tighten the clamping screws (E) with a torque of 20 Nm. Tighten the screws (C, F, G) with a torque of 8 to 10 Nm.

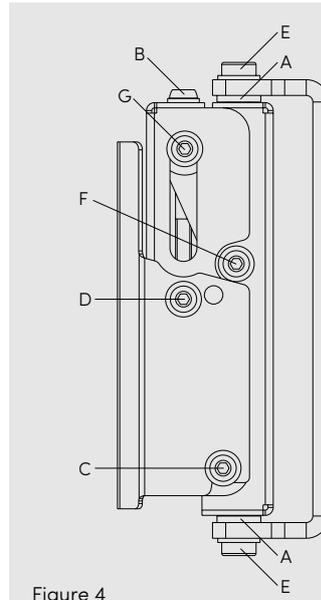


Figure 4

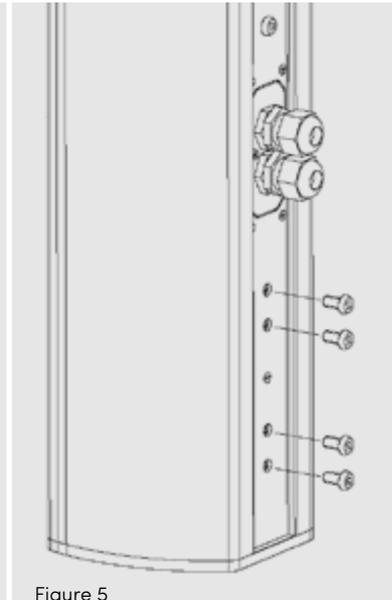


Figure 5

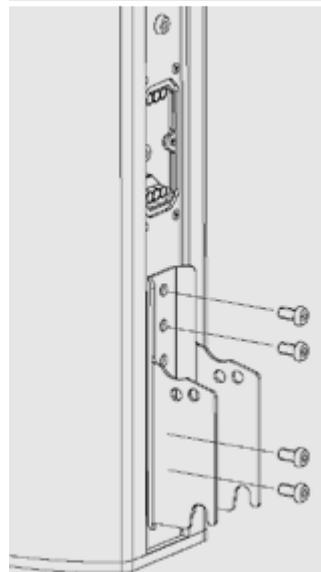


Figure 6

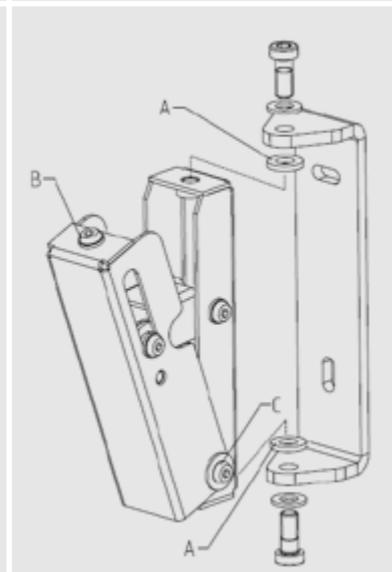


Figure 7

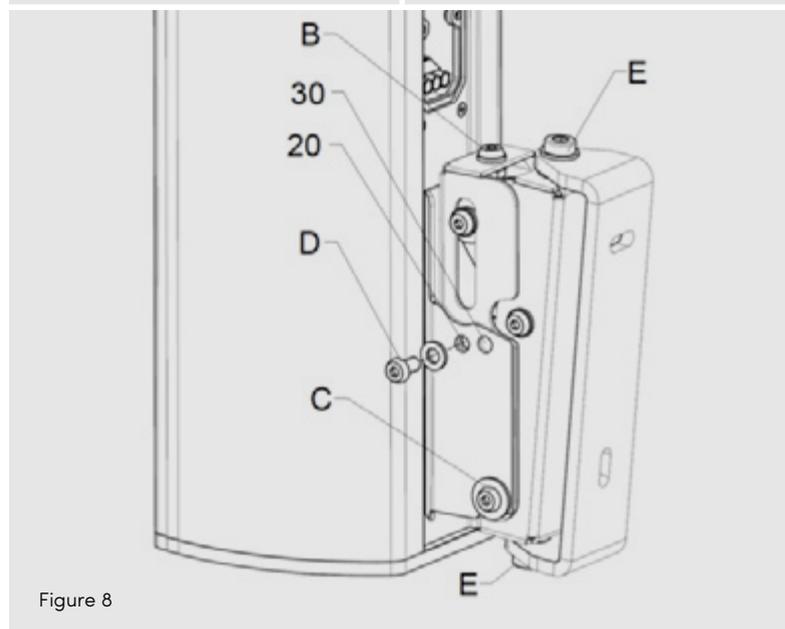


Figure 8

MOUNTING WITH THE WAL-03 BRACKET (LEN-20 ONLY)

1. Remove the two M6 oval-head screws that are located underneath the connector panel. [SEE FIGURE 9.](#)
2. Fix the **WAL-3** to the wall using two screws and wall plugs. For this, use the part containing the two slotted holes at right angles.
3. Fix the bracket to the loudspeaker using the **WAL-3's** mounting plate. Apply medium strength thread lock fluid to all screws. Firmly tighten all screws using the required torque.
4. Tighten the M8 nut (F) just as far as it is still possible to turn and angle the loudspeaker. Set the required rotation and inclination angles. [SEE FIGURE 10.](#)
5. Once you are happy with the above angles, tighten the M8 nut (F) using a torque of 18 Nm.

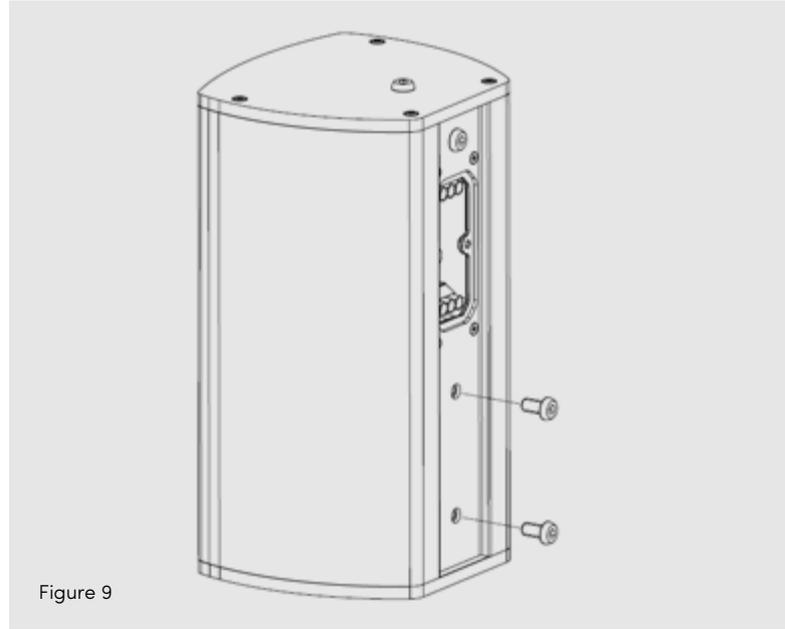


Figure 9

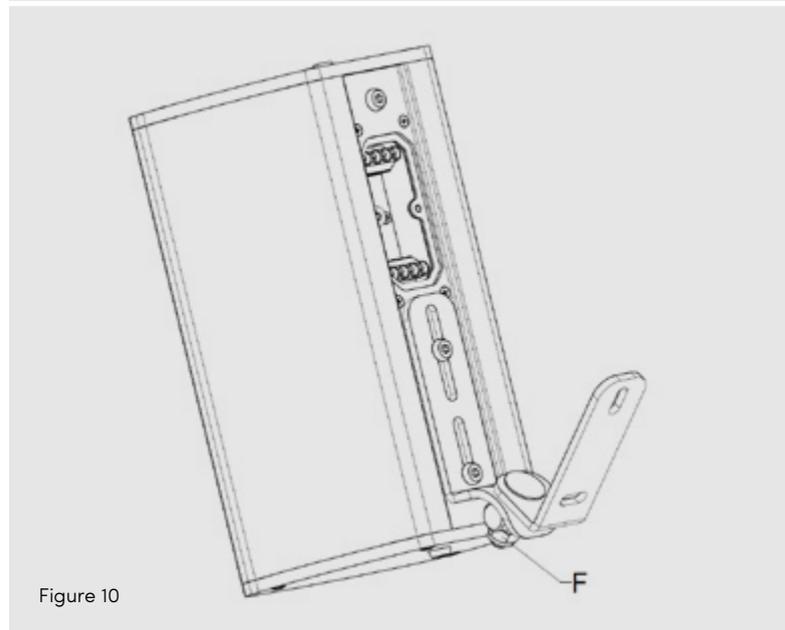


Figure 10

3.2 WIRING

All **LC** series loudspeakers are passive systems designed for use with external amplifiers. They have identical cabling connectors and can be supplied with a choice of two options:

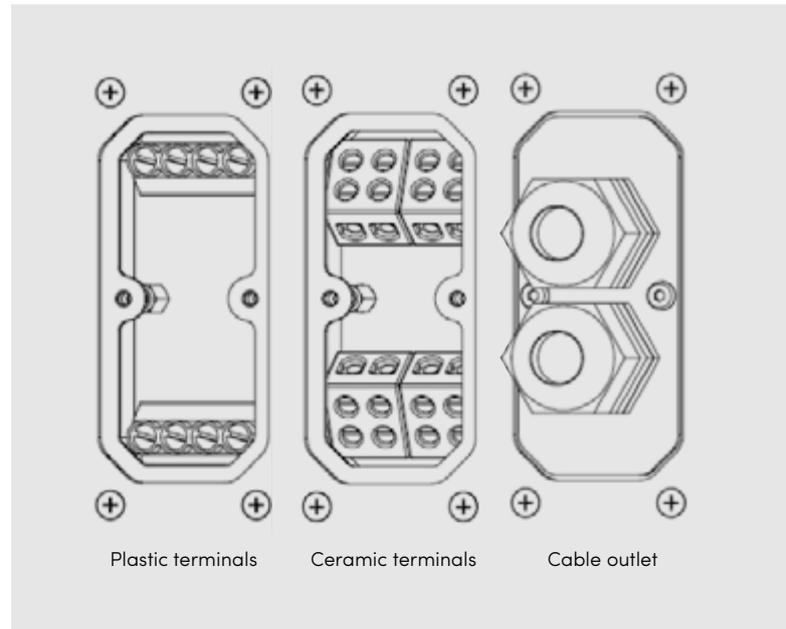
- 2 × 4 plastic terminal blocks are supplied as standard. These are suitable for wires with a cross section of up to 4 mm².
- The loudspeakers can also be supplied with 2 × 4 ceramic terminal blocks. These are suitable for wires with a cross section of up to 2.5 mm².

All cables used must be of an appropriate cross section. We recommend using ferrules for stranded wires.

A sealing plate is attached to each loudspeaker, along with two M16 cable glands. Once cabling has been completed, this can be used to cover the connector panel and provide tension relief for the cable.

Please be aware of the fact that the specified degree of protection (in accordance with IEC 60529) is only obtained by mounting the sealing plate correctly. The cable glands are suitable for use with cables of between 6 and 10 mm in diameter.

If only one cable is being used, the other cable gland should be replaced by the dummy plug that has been supplied with the loudspeaker.



3.3 OPERATING CONDITIONS

The recommended operating temperature range for this system is $-25\text{ }^{\circ}\text{C}$ to $+70\text{ }^{\circ}\text{C}$. If used in temperatures below $0\text{ }^{\circ}\text{C}$, the system should be permanently operated using a pilot tone in order to prevent the system from freezing and getting stuck.

Always allow the system to acclimatise before using it.

Do not subject the system to aggressive chemical liquids or vapours.

Always ensure that heat can be dissipated over the external surfaces of the housing.

The system should be well ventilated at all times. To ensure sufficient air-flow, it should not be covered with towels. Heat from the sun and strong lighting should also be avoided.

Do not subject this system to strong vibrations!

3.4 TRANSPORTATION AND STORAGE

This system should only be transported in its original packaging.

Store it in a dry place with an even temperature, so that it is not affected by condensation.

The recommended temperature range for storing this system is $-10\text{ }^{\circ}\text{C}$ to $+70\text{ }^{\circ}\text{C}$.

3.5 MAINTENANCE

Clean the system as required using a damp cloth. Do not use any cleaning products that contain aggressive chemicals.

3.6 SERVICING AND REPAIR

Servicing and/or repairs should only be carried out by qualified personnel who have been trained by **FOHNN**.

Do not carry out any servicing or repair on a system other than stated above.

To find a **FOHNN** Service centre in your area, please contact us at the address on the back page of this manual.

Keep the packaging that has been supplied with this system so that, in the event of any damage, it can be returned in its original packaging. This will reduce the risk of any further damage occurring during transportation.

4. TECHNICAL DATA

Model		LC-20	LC-60	LC-100	LC-150	LC-220
Electroacoustical features						
Acoustic design		weatherproof passive line source speaker system, closed, passive 2-way CD crossover and filter, suppression of side lobes by Source Division Waveguides (SDW)				
Number of 4" drivers with treated cones		2	6	8	12	18
2-way design		No	Yes	Yes	Yes	Yes
Power rating (nominal) [1]	W	60	180	240	360	440
Power rating (program) [2]	W	120	360	480	720	880
power rating (peak) [3]	W	240	720	960	1440	1760
Sensitivity [4]	dB SPL	93	97	98	100	101
Maximum SPL	dB SPL	117	125	127	131	133
Frequency range [5]	Hz	120 - 12000				
Nominal dispersion (hvx) [6.2]	Deg	130 x 60	130 x 25	130 x 15	130 x 14	130 x 14
Nominal impedance	Ohms	16	12	8	4	4
Mechanical features						
Housing		weatherproof aluminium housing, powder coated, steel bracings				
Mounting points		4xM6	8xM6	8xM6	8xM6	10xM6
Front design		ball impact resistant steel grille, galvanized and powder coated in enclosure colour, backed by acoustically transparent foam				
Protection class acc. to IEC529/EN60529		IP54				
Terminal		terminal connectors capable of receiving up to 4mm ² , two per pin, terminal cover with dual cable gland for up to 10mm cable diameter				
Weight [7]	kg	2,5	6	8	11,5	16
Width	mm	130	130	130	130	130
Depth	mm	120	120	120	120	120
Height	mm	230	640	990	1460	2200
Standard colours		black (RAL 9005) or white (RAL 9016)				
Optional features						
Custom colours		all RAL classic colours				
Weather protection		weatherproof without further protection as standard				
Terminal		ceramic terminals capable of receiving up to 2,5mm ²				
CAAD Simulation data		EASE, Ulysses, CLF				
Optional accessories						
Wallbracket WAL-1		x	x	x	x	x
Wallbracket WAL-03		x				
Wallbracket WLX-100			x	x	x	
Wallbracket WLX-221						x

All measurements normalized to freefield full-space conditions

[1] according to IEC-60268-5 long term

[2] according to IEC-60268-5 short term

[3] Peak, 20 ms with bandpass filtered pink noisesignal according to IEC 60268-2 at one octave above the lower limit of the frequency range

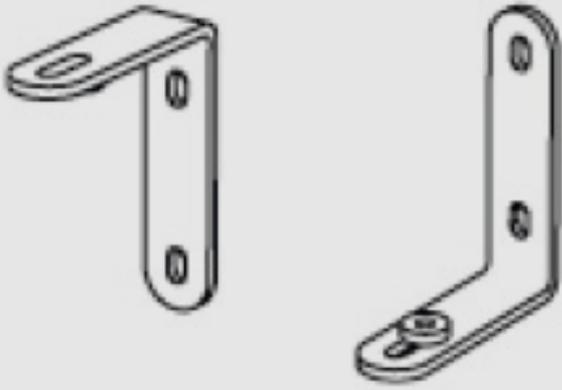
[4] 2,83 V at 8 ohms (2 V at 4 ohms, 3,46 V at 12 ohms, 4 V at 16 ohms) normalized to a distance of 1 meter

[5] -10 dB under anechoic halfspace-conditions

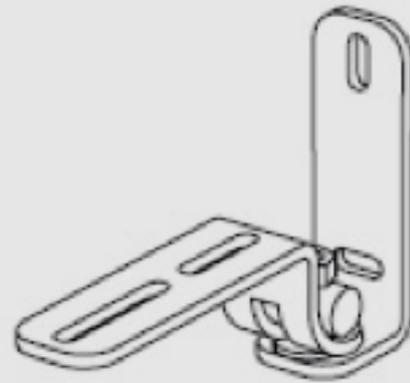
[6.2] horizontal x vertical at -6 dB, averaged 1-4 kHz

[7] net weight without optional equipment

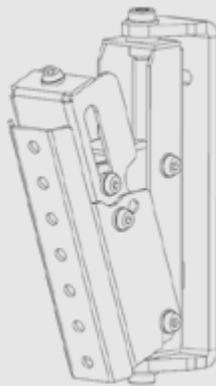
5. ACCESSORIES



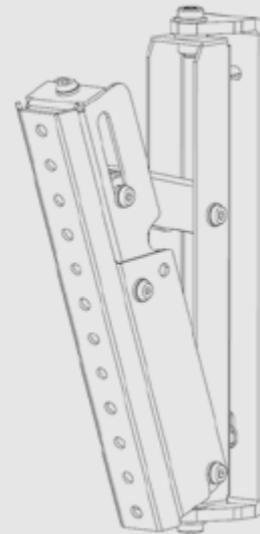
WAL-1



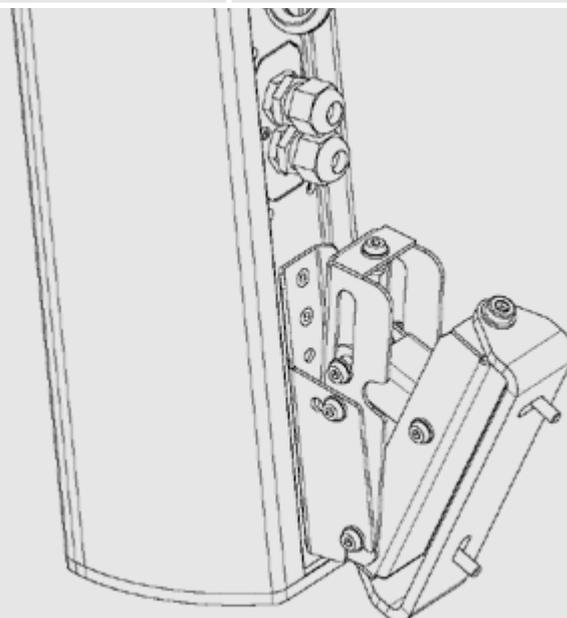
WAL-03



WLX-100



WLX-221



LC loudspeaker with wall bracket

6. EG CONFORMITY (CE MARKING)



This loudspeaker complies with the currently applicable conditions of EMC law and as such, carries the CE marking.

The relevant Declarations of Conformity are available on request from **FOHNN AUDIO AG**

7. WEEE DIRECTIVES (DISPOSAL)



Electrical and electronic components must not be disposed of in standard household waste. For this reason we include the dustbin symbol shown here on our products and in manuals.

Please consult your dealer or distributor regarding product disposal in your particular country.

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