

Data sheet
LX-60



Linea-Series

Directional Speakers.



FOHNN®
HYBRID LINE ARRAY TECHNOLOGY





Linea LX-60 is a high-quality sound system that incorporates sophisticated 2-way speaker technology. A total of four 4" high-performance line array speakers and one 1" compression driver with advanced HF Waveguide system produce sound with accurate, cylindrical dispersion characteristics (line array principle).

Description

The Next Generation of Mini Line-Array Systems.

Linea LX-60 is a compact Mini Line Array System, specially designed to give top quality reproduction of both, speech and music. The speakers' slim, unobtrusive design integrates seamlessly into stage areas and room architecture, appealing to event organizers, agencies and audiences.

In the LX-60 4x 4" neodymium drivers produce sound with accurate cylindrical dispersion characteristics in the mid-low range. At the top end an 1" compression driver with Fohhn® Waveguide ensures the cylindrical wave's continuation up to the highest audible frequencies. Speaker adjustment is done by an integrated crossover with Intelligent Protection Circuit (IPC) to guard against overload.

Our engineering team developed the unique Fohhn Hybrid Line Array principle by combining high performance bass-mid speakers and 1" compression drivers with a Waveguide system. The result – a new generation of high powered Mini Line Array Systems. The Fohhn Hybrid principle has led to the achievement of outstanding sound quality in speech and music, superb dynamics and even coverage of audience areas. The LX-60 is fully compatible with the Fohhn system concept.

The LX-60 can be effectively teamed with the AS-06, AS-10, AS-22 or XS-10, XS-22 subwoofer.

PC data files for the simulation programm EASE are available.

Controlling Linea LX speakers

We always integrate a sophisticated passive crossover with electronic high-frequency protection so you can operate the LX-60 with any professional amplifier. For maximum sound performance and operating reliability, we recommend our digital DSP amplifiers (e.g. D-2.750, D-4.750 or D-4.1200). Its integrated DSP technology includes a number of factory loudspeaker presets. These guarantee total operating reliability and superb performance at any sound pressure level. Programmable audio tools, such as the 10-band parametric EQ, enable quick adjustments to suit the room acoustic and any related microphone set-ups. All DSP functions can be carried out remotely using a laptop.

DSP technology

Fohhn® DSP processor technology modulates the Linea LX-60 and Fohhn subwoofers perfectly. Digital Fohhn signal processors are integral components of active Fohhn subwoofers, Fohhn DSP amplifiers and Fohhn DSP controllers. Fohhn DSP devices can be controlled remotely from a central location in the room or on stage via intuitive remote control units. Fohhn therefore offers a perfectly adapted sound system that fulfils all the requirements of a modern speaker system regarding design, sound quality and operating comfort in every respect.

Accessories

Mounting bracket WAL-1, wall bracket WAT-08 / WAT-08k / WAT-12, Stand mounting: joint adapter SA-6, SA-7 Free Stand II and III

Applications

Churches, museums, castles, conference rooms, hotels ...

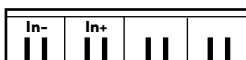
Optional versions

Optional 100 volts version. All RAL colours.

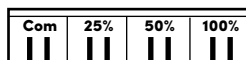
Connectors

8-way Phoenix terminal strip, two adjacent pins are always connected in parallel to loop through another speaker system.

LowZ Version (low impedance)



100 volts version with pickups



Technical specifications

electro-acoustical features

acoustic design	passive hybrid line source speaker system, 2-way, weather resistant
components	4x 4" long excursion with treated cones, 1x 1" compression driver on Fohhn®-Waveguide with self-resetting IPC[*]-HF protection, fully neodymium
power rating (nominal) [1]	200 W
power rating (program) [2]	400 W
power rating (peak) [3]	800 W
sensitivity [4]	90 dB
maximum SPL [3]	119 dB
frequency range [5]	85 Hz - 20 kHz
nominal dispersion (h x v) [6.2]	130° x 30°
nominal impedance	8 ohms

features

enclosure	weatherproof aluminum
protection grille	steel, ball impact resistant, powder coated
rigging points	8x M6 threads
connections	8-pin Phoenix terminal
standard colours	black or white powder coating
front design	steel grille in enclosure colour, backed by acoustically transparent foam
dimensions (W x H x D)	130 x 640 x 120 mm
weight [7]	5,0 kg

optional features

integrated 100 V-transformer	60/30/15 W
optional colours	all RAL-colours
weather resistance	weatherproof

CAAD simulation data

EASE

The manufacturer reserves the right to make technical modifications according to legal regulations stipulating the continual improvement of product features.

according to IEC-60268-5 long term

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

[2] Peak, 20 ms with bandpass filtered pink noise signal 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, 4 V at 16 ohms) at a distance of 1 meter under anechoic fullspace conditions

[5] -10 dB under anechoic halfspace-conditions

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

[7] net weight without optional equipment

[*] Intelligent Protection Circuit. Voltage-controlled semiconductor circuit protecting the HF-driver against overload highly effective and with very short attack time.



Fohhn® Hybrid Line Array technology.

Fohhn® Linea Live Systems redefine the concept of balanced sound, excellent sound quality and sophisticated design.

Fohhn's specially developed Hybrid Line Array Technology integrates high performance, vertically aligned loudspeakers and powerful high frequency drivers with Waveguide in a compact housing.

Systems from the Fohhn Linea LX series have a hybrid design that is based on a combination of classic two-way speakers and modular line array, and incorporates the functional advantages of both principles.

For many years we have carried out research and development in the field of high powered Mini Line Array Systems. Our original aim was to take the benefits associated with large modular line array systems such as directionality, even coverage, long throw and transport them into more compact, easy to install systems. We successfully achieved our aim in 2006 with the release of our Linea-Series. By 2007 our Linea LX systems had set new standards for line source column speakers. Our engineering team developed the unique Fohhn Hybrid Line Array principle by combining, for the first time ever, high performance bass-mid speakers and 1" compression drivers with a Waveguide system. The result – a new generation of high powered Mini Line Array Systems. The Fohhn Hybrid principle has led to the achievement of outstanding sound quality in speech and music, superb dynamics and even coverage of audience areas.

Linea LX: An overview of the main advantages

*** First-class sound with excellent dynamics**

Whether used for full-on live music and DJ events, or for demanding speech applications, Linea LX systems guarantee superb sound quality at any loudspeaker level.

*** Even sound distribution with Fohhn Hybrid Line Array Technology**

Compared with conventional systems, sound is distributed much more evenly throughout the room, with a pleasing effect at the front and clear, coherent sound right at the back.

*** Superb speech intelligibility**

Sound can be specifically targeted towards the audience, avoiding unwanted reflections from the ceiling or floor. For the listener, the result is clear and pleasant. Speech intelligibility is considerably improved.

*** Perfect integration into room architecture and stage designs**

The elegant designer speakers integrate extraordinarily well into their surroundings. They won't interfere with either stage designs or camera shots.

*** Disturbance-free listening**

Feedback is rarely an issue, even with complex microphone set-ups.

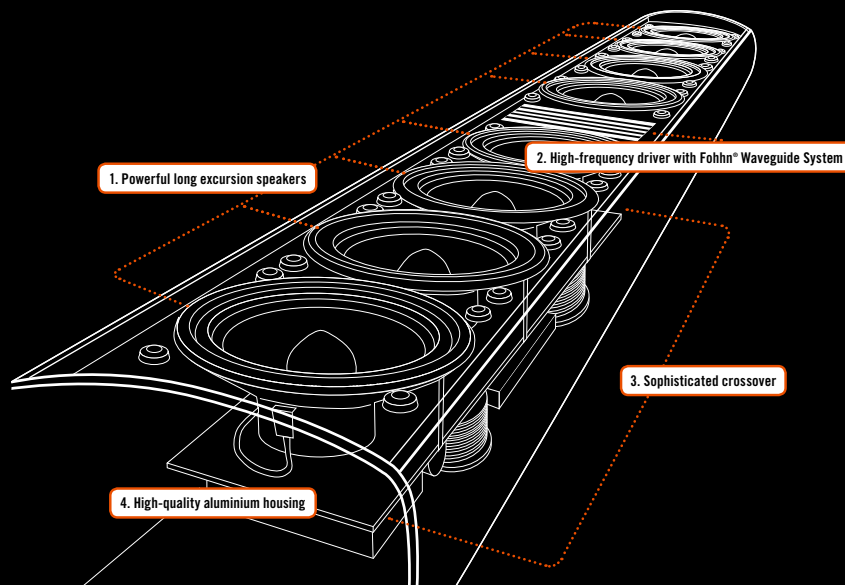
*** Easier transportation and quicker set-up**

Linea LX speakers are equipped with state-of-the-art, lightweight neodymium loudspeaker technology. Conveniently positioned handles ensure quick and safe set-up. The speakers' compact dimensions reduce the amount of space needed for storage and transportation.

*** No need for expensive rigging or curving.**

Compared with modular line array systems, no expensive flying mechanisms, rigging or curving are necessary. All the line array technology is integrated into a single housing, enabling quick and easy installation.

The difference is the detail.



1. Powerful long excursion speakers guarantee outstanding dynamics.

Extremely powerful 4" long excursion speakers manufactured by using state-of-the-art neodymium technology guarantee resonant, dynamic reproduction of vocals and instruments. The coated weatherproof membranes are exceptionally resilient and capable of reproducing sound without distortion. The speaker chassis are arranged at close proximity in a perfect line and generate a cylindrical wave in the mid range.

2. High-frequency driver with a Waveguide Systems guarantees crystal clear high notes and excellent sound dispersion characteristics. A powerful 1" neodymium high-frequency driver with upstream Fohhn Waveguide system produces crystal clear high tones and defined sound dispersion characteristics. The Waveguide extends the cylindrical wave from the mid range to the highest frequencies. Conventional column speakers operate entirely without high frequency systems.

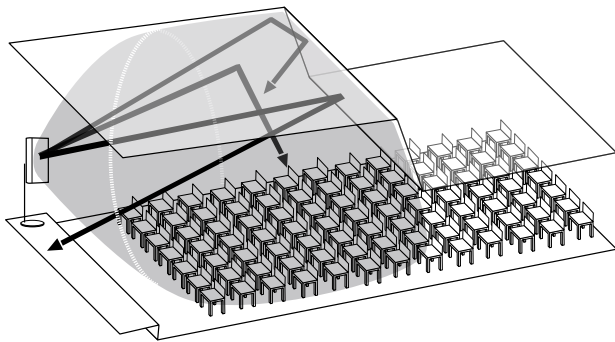
3. A sophisticated crossover adapts the speakers perfectly.

A sophisticated crossover with selected components and electronic Fohhn IPC speaker protection is the perfect interface between the 4" chassis and the high-frequency driver. Conventional column speakers usually operate without a crossover.

4. The high-quality aluminium housing is ideal for mobile sound applications, fixed installations and weatherproof applications. Linea LX system housings are manufactured from high-quality profiled cast aluminium, are extremely robust and provide a maximum protection for all internal components. The elegant housing is available in anodised black as standard as well as all RAL colours on request.

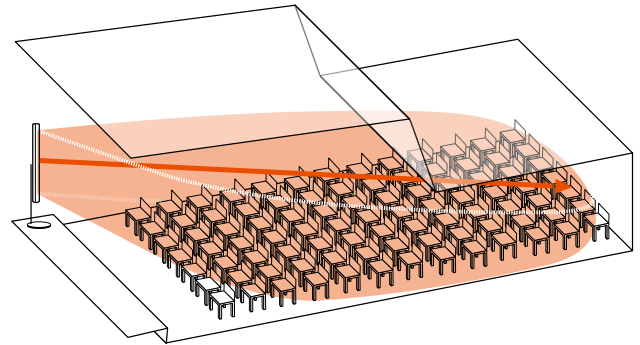
PERFECT DIRECTIONALITY. PERFECT SOUND.

An incredible listening experience, from the front row to the very back row.



PA systems with conventional speakers

In comparison with line array systems, conventional loudspeakers offer a less directional coverage, particularly in the vertical plane. Levels at the front are often too loud, while at the back, the sound may be too quiet or lacking in clarity due to insufficient reach.



Linea systems for sound

The cylindrical dispersion characteristics of Fohhn's Linea Live Mini Line Array Systems give a more targeted sound transmission to audience areas. The speakers also provide a more even room coverage, from the front row right to the very back. Potential reflections from the ceiling, floor or walls can be avoided, making the sound clearer and more pleasant for the audience, with dramatically improved speech intelligibility. The effect is also better for musicians or public speakers, with less sound from the room reflecting back onto the stage.

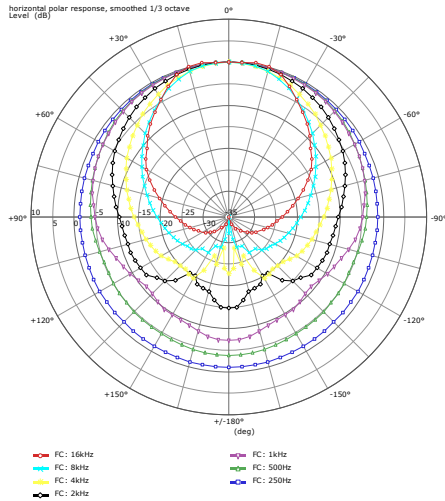


Fig. 1: Horizontal polar pattern

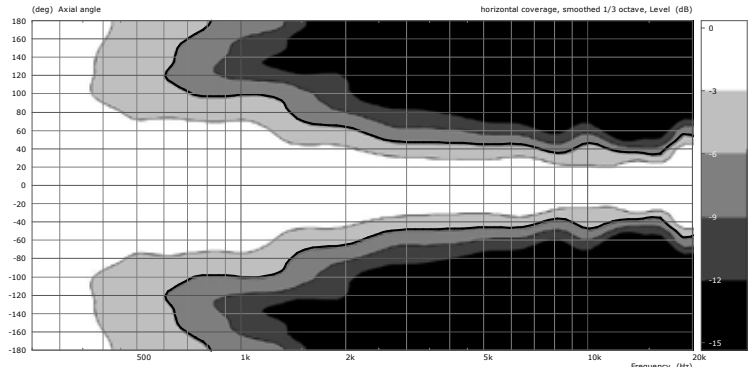


Fig. 2: Horizontal coverage

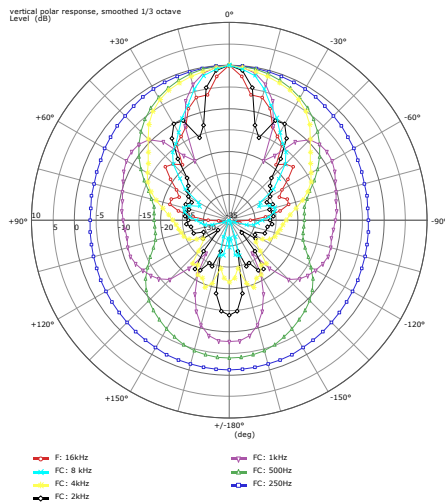


Fig. 3: Vertical polar pattern

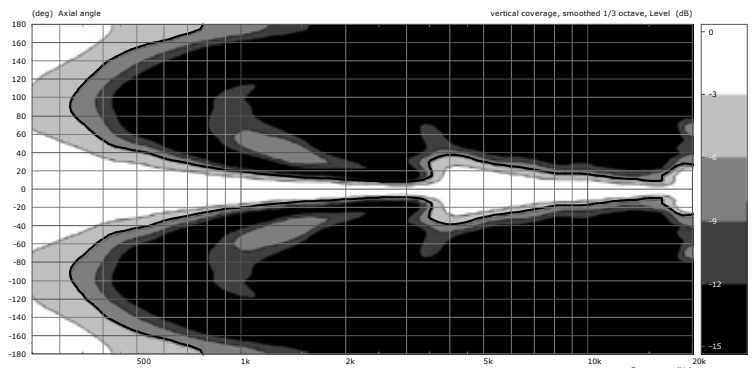


Fig. 4: Vertical coverage

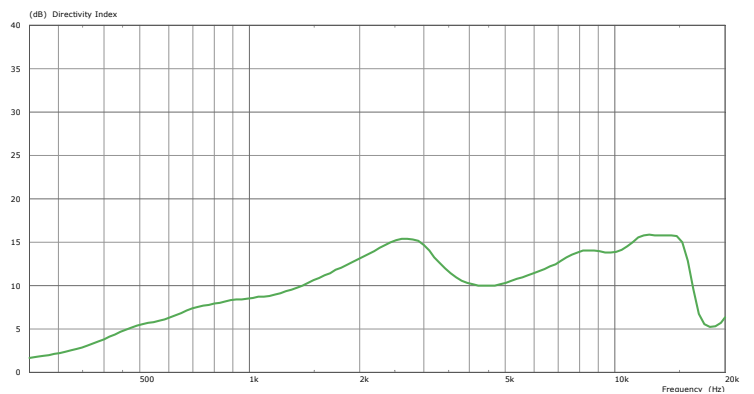


Fig. 5: Directivity index

Fig. 6: Frequency response

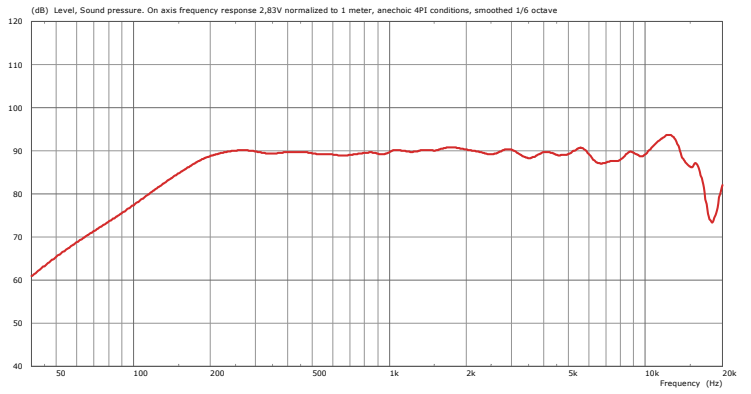


Fig. 7: Impedance

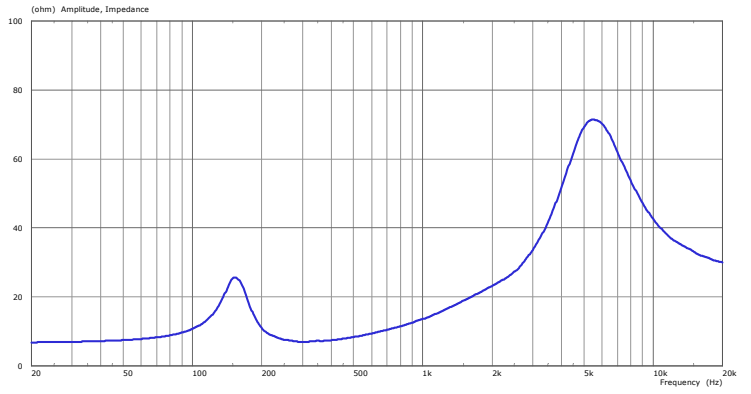
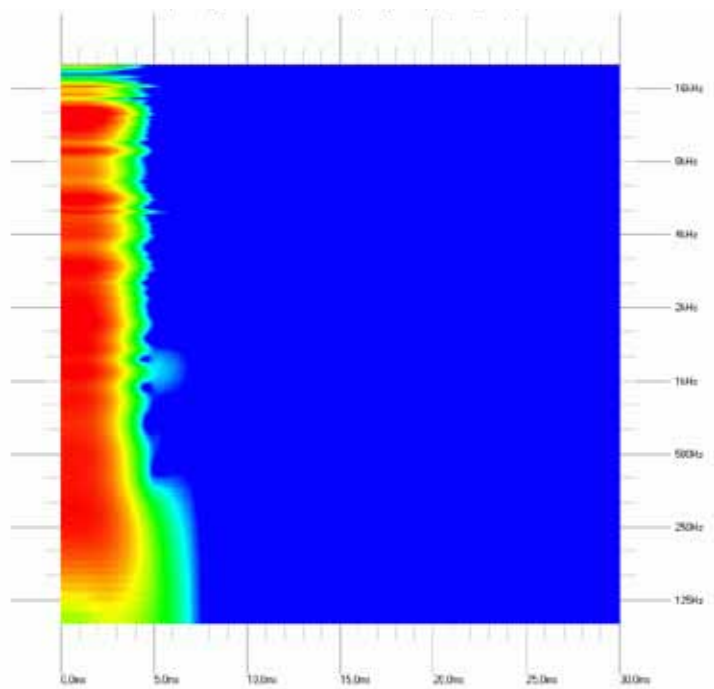


Fig. 8: Spectral decay



Controlling Linea-Series speakers

1. Fohhn system DSP amplifiers

Fohhn offers a range of specially adapted system DSP amplifiers for controlling Arc speaker systems, which guarantee maximum sound performance and operational reliability for your Fohhn products. As manufacturers of speaker, amplifier and DSP technology, we know our systems inside and out right down to the smallest detail and are therefore in a perfect position to provide our users with the best overall system.

Fohhn System DSP amplifier are offering following advantages:

Integrated high-performance DSP technology:

- quick set-up,
- minimal space requirements in electronics cabinet,
- minimal cable requirements,
- fewer cable faults,
- controller and amplifier can be controlled and monitored using the same software.

Dual DSP technology

The DSP amplifiers contain 2 separate DSP engines with enormous capacity and processing power for 5 digital audio devices (DSP-1) and Fohhn specific speaker databases (DSP-2).

Remote monitoring and control

Integrated temperature and operating time monitor, status indicator / protection, remote control capability / network compatibility using a laptop, wall installation modules or media control systems.

Fohhn® dual DSP technology

DSP-1: Integrated digital audio devices

Each amplifier channel has a:

- programmable 10 band parametric EQ,
- compressor/limiter/noise gate,
- delay,
- X-over function,
- top-quality pink noise and sweptone generator

DSP-2: Speaker management

An integrated speaker database guarantees excellent sound quality and protection for all Fohhn speaker types. A sophisticated algorithm developed by Fohhn engineers and adapted to each speaker allows the individual monitoring and adjustment of bass, mid and high ranges.

1.1 Amplifier recommendations for the Linea-Series



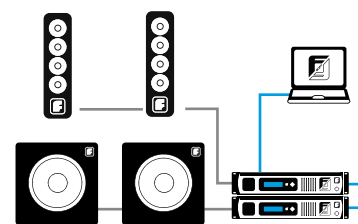
D-2.750

2 channel operation, 2x 750 W / 4 ohms, 2x 390 W / 8 ohms, Fohhn Audio DSP, display, remote control

D-4.750

4+2 channel operation, 4x 750 W / 4 ohms, 4x 390 W / 8 ohms
2x DSP line out channels for controlling a conventional amplifier
 Fohhn Audio DSP, display, remote control

	Arc-Tops										Linea				Arc-Subs							
	AT-05	AT-061	AT-07	AT-08	AT-09	AT-10	AT-22	AT-221w	AT-35	AT-40	AT-50	AT-661w	AL-10-150	LX-10-61	LX-100-220	LX-500/501	LX-600/601	AS-06/10	AS-22	AS-31	AS-40	
D-2.750	x	x	x	x	x	x	x	x					x	x	x			x	x			
D-4.750	x	x	x	x	x	x	x	x					x	x	x			x	x			
D-2.1500									x	x	x	x				x	x			x	x	
D-4.1200									x	x	x	x			x	x				x	x	



2x Sub passive / 2x Top passive
2x DSP amplifier

Controlling Linea-Series speakers

2. Standard amplifiers combined with Fohhn controllers

Standard amplifiers / 100V amplifiers / multichannel amplifiers combined with Fohhn FC-9 DSP system controllers

All of the speaker systems in the Fohhn Arc-Series can be operated in combination with standard amplifiers (e.g. Bittner amplifiers). Each Fohhn speaker model has a linear design, neutral sound adaptation function and is fitted with an integrated crossover with electronic tweeter protection.

We recommend integrating the FC-9 Fohhn DSP system controller for applications involving standard multichannel amplifiers, 100V amplifiers or monitored amplifiers according to EN 60849.

The FC-9 guarantees maximum sound quality, operational reliability and performance features that no other standard controller can offer in combination with our Fohhn speakers.

Sound quality. Reliability. Intelligent control.

- * Fohhn DSPs guarantee maximum sound performance
- * 5 premium audio tools such as Parametric EQ are integrated
- * Integral speaker and amplifier database for maximum operating reliability
- * Remote monitoring/operation, network-compatible
- * Automatic amplifier calibration function CAS
- * 8 input switching contacts for easy system integration
- * Perfect adaptation to all standard amplifiers

FC-9 DSP system controller



BITTNER
AUDIO

In addition to our special Fohhn® DSP amplifiers, we also offer the complete range of **amplifiers manufactured by Bittner Audio** for low-ohm or 100 volt applications. Bittner Audio offers solutions such as multichannel amplifiers with eight standard channels and **important features for integration in electroacoustic emergency warning systems according to DIN EN 60849 (VDE 0828)**. Contact us for more information!

Advantages of the FC-9 controller:

Perfect adaptation to all standard amplifiers

Automatic amplifier calibration function and integrated amplifier database for perfect adaptation.

Dual DSP technology

The FC-9 contains 2 separate DSP engines with enormous capacity and processing power for Fohhn specific speaker databases and 5 digital audio devices.

Integrated speaker database

Guarantees excellent sound quality and protection for all Fohhn speaker types.

A sophisticated algorithm developed by Fohhn engineers and adapted to each speaker allows the individual monitoring and adjustment of bass, mid and high ranges.

Remote monitoring and control

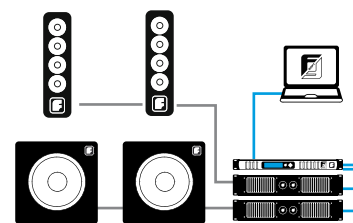
Remote control capability / network compatibility using a laptop, wall installation modules or media control systems.

8 input switching contacts

The FC-9 has 8 input contacts. The inputs can be utilized to switch between the different presets of the FC-9, as well as other Fohhn-Net devices. With two inputs and two pushbuttons (shutters) connected to them, a volume control can be realized as well.

4 inputs / 6 outputs (24 nodes)

A programmable 10-band parametric EQ, compressor/ limiter/noise gate, delay, X-over function, top-quality pink noise and swepttone generator are available at each output, allowing you to conveniently adapt the Fohhn system to the room acoustics or your own personal requirements.

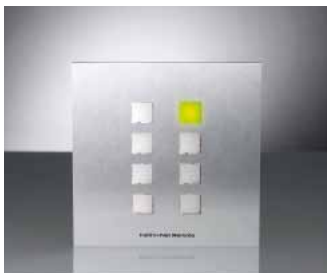


2x Sub passive / 2x Top passive
2x standard amplifiers
1x DSP system controller FC-9

Remote control and network ability of Fohhn devices with integrated DSP

FR-10

remote control wall panel designed for the remote operation of Fohhn devices with integrated DSP.



Description

The FR-10 is a wall mount remote control module designed for the remote operation of Fohhn DSP amplifiers, DSP controllers and active Fohhn speakers systems. The FR-10 is extremely easy to operate because the controls are so well arranged. It is virtually impossible for the end customer to make operating errors because the only operating elements are the 8 labelled buttons.

Easy handling

Control up to 31 Fohhn devices individually with this stylish FR-10 wall panel. 8 programmable buttons can be configured to control the overall volume of a system, the volume in different zones or presets for different room effects, for example. The system also has a special function that confirms whether all commands have been executed successfully. The buttons indicate this by changing red or green shortly after they are pressed. For example, if a device is not switched on, the button changes red to indicate that a command could not be executed. This additional monitoring function ultimately contributes to the overall operating reliability of your system. The wall panel is easy to configure using a standard computer with intuitive Fohhn-Net Remote software installed.

Connections

Two terminal strips (paralleled). Alternative connection via standard 4-wire telephone cable.

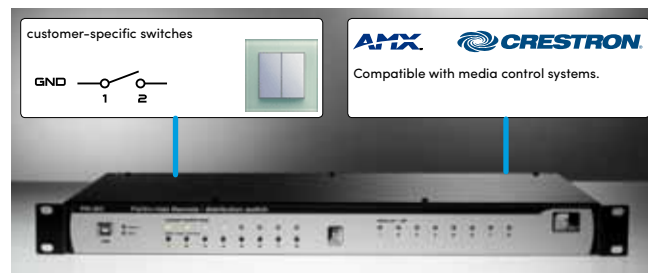
Applications

The FR-10 is ideal for training rooms, hotels, churches, halls, restaurants or any venue where a simple, efficient system is required to control your audio equipment from a central location.

The FR-10 is also ideal for projects where complex media control systems are not viable or inappropriate, but the user wishes to control the speaker system centrally.

FR-20

19" remote control unit can be controlled via conventional external buttons or switches.



Description

The FR-20 can be controlled via conventional external buttons or switches (e.g. Jung, Vitra, etc.) or switching contacts (e.g. media control system). Buttons and switches may come in the form of a wall installation module or an individually manufactured control panel, for example.

Presets stored in the connected Fohhn DSP devices are activated simultaneously and settings for different scenarios such as speech, music, empty room, full room, etc are loaded when the buttons/switches are pressed. You can also adjust the volume quickly and easily in 1 dB increments using the FR-20. A maximum of 31 Fohhn devices connected to the network can be activated simultaneously at the press of a single button.

Integration in a media control system

The FR-20 allows the convenient integration of all DSP-controlled Fohhn devices into media control systems (e.g. AMX, Crestron) by means of 8 switching contacts or RS-485 interface.

Integration in a EIB bus technology

One building, one concept, one system.

Fohhn systems equipped with a FR-20 distribution switch comply with the „European installation bus technology“ standard, including all operating comforts.

Applications

The FR-20 is ideal for training rooms, hotels, churches, halls, restaurants, clubs, bars and many other venues.

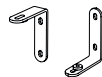
For simple, reliable remote operation of your audio system without having to install complex, expensive media control systems.



Accessories for LX-60

WAL-1

pair of L-brackets for Linea LX-60 / LX-61 / LX-100 / LX-150



WAT-08k

Wall bracket short for Linea LX-60 / LX-61 / LX-100 / LX-150



WAT-08

Wall bracket for Linea LX-60 / LX-61 / LX-100 / LX-150



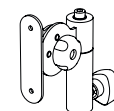
WAT-12

Wall bracket for Linea LX-60 / LX-61 / LX-100 / LX-150



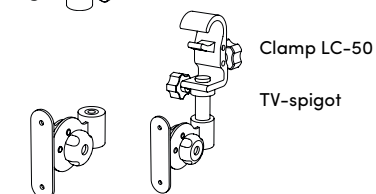
SA-6

Pivot reducing flange, 36mm dia. with **2x M6** screw for Linea LX-60 / LX-61 / LX-100 / LX-150 with external teeth lock washers



SA-7

Special bracket for traverse mounting e.g. with optional Clamp for LX-60 / LX-61 / LX-100 / LX-150 with LC-50 and TV-spigot with M10 female thread.



EB-6

Safety eyebolt DIN 580, zinc, for safety M6 thread



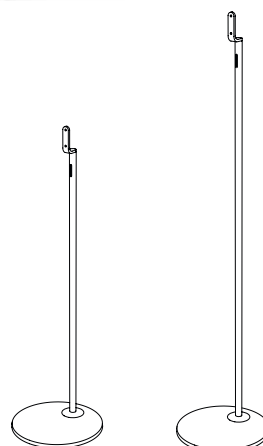
Carrying bag

CB-LX-150 with Inlay CB-LX-150 for 2 x LX-60/61, padded



Free Stand II

Designer stand with heavy round steel base with rubber feet for maximum stability obscured cable guide in the stand and round base. Wt: 14 kg, **H: 1200 mm**, base-diameter: 360 mm. Round base: black or white, stand tube: matt black. Appropriate for LX-60/61/100/150



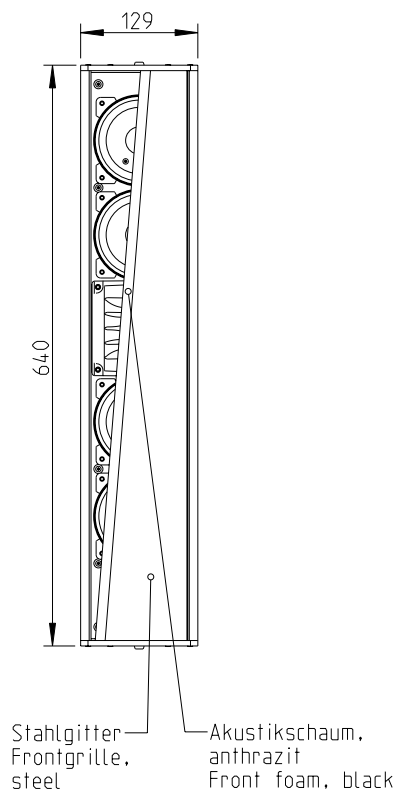
Free Stand III

Designer stand with heavy round steel base with rubber feet for maximum stability obscured cable guide in the stand and round base. Wt: 14 kg, **H: 1600 mm**, base-diameter: 360 mm. Round base: black or white, stand tube: matt black. Appropriate for LX-60/61/100/150

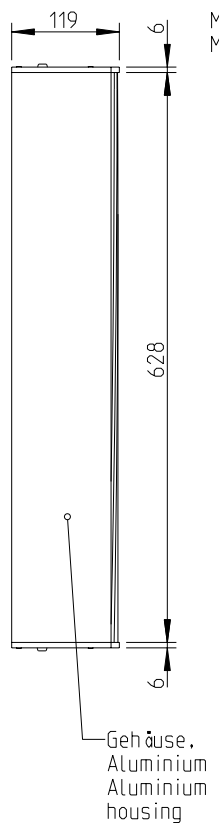


Views of LX-60

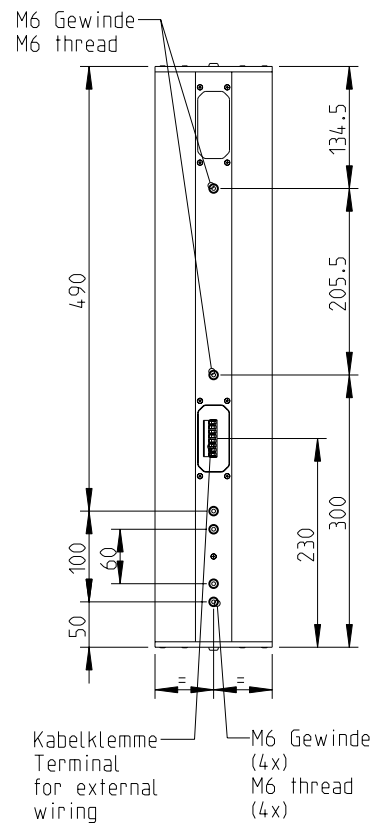
Front view



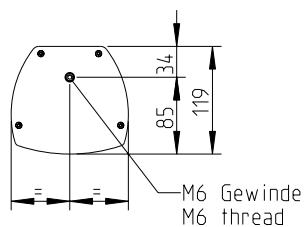
Side view



Rear view



Top View = Bottom view



FOHHN.
SOUNDS PERFECT.
IS PERFECT.



■ GERMAN QUALITY
■ ENGINEERED AND MADE
■ BY FOHHN®

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