Data sheet

LFI-220

WWW.FOHHN.COM

Fohhn® Linea Focus
WINNER OF 2009/2010 MIPA AWARD
PRO AUDIO / PORTABLE SOUND CATEGORY
As voted for by 111 international MI & Pro Audio Magazines

IE Pick of prolight+sound 2011
Installation Europe EDITORS' AWARDS
Best of prolight+sound 2011
Fohhn® Linea Focus modular

Linea Focus

The next generation of electronically steerable line array systems.

LFI-220
16x 4" neodymium loudspeakers,
16x CLASS D amplifiers,
16x DSP processors, Length: 2.20 m

The Linea Focus familiy

The innovative, finely tuned Linea Focus family differentiates itself from other products because of its column length. This is due to the number of integrated loudspeakers, amplifiers and DSP channels, which enable each individual speaker to be electronically controlled.

The flagship LFI-450, for example, contains 32 integrated loudspeakers, 32 amplifiers and 32 DSP channels. The vertical sound inclination angle can be adjusted between -40°/+40° and the vertical beam width between 0° to 90°. Using Fohhn's intuitive software, adjustments are made in unbelievably fine and precise 0.1° steps.

An outstanding feature of the Linea Focus series is Fohhn's **„Two Beam Technology".** This allows the speakers to generate two separate beams in their vertical dispersion range, providing simultaneous and focussed coverage of different audience areas, such as stalls and gallery.

The **acoustic centres** of both beams can be set anywhere from 0% (at the bottom of the column) to 100% (at the very top), making the speaker suitable for use in the most challenging acoustic conditions.

A further unique feature is Fohhn's new **"Side Lobe Free Technology"**, a special algorithm developed in house to suppress the unwanted side lobes that will inevitably occur in the beam. This results in a more directional sound and significantly improved speech intelligibility.

The different lengths of the Linea Focus models determine their acoustic efficiency. The longer the line array, the longer its reach and also its effectiveness in the control of low frequencies. Multiple Linea Focus systems can be networked together to enable monitoring and control from a central location.

Linea Focus – Outstanding for 5 good reasons

1. Superb sound quality in challenging acoustic environments
Linea Focus takes sound reproduction of both speech and music to the next level. The speakers' sound dispersion characteristics can be adjusted to suit the room conditions, avoiding unwanted reflections and providing even coverage of all audience areas. Because of this, it's possible to achieve superb speech intelligibility and a clear cohesive image, even in the most demanding acoustic conditions.

In comparison: Conventional PA systems have more permanently defined sound dispersion characteristics. These are usually either too wide, or they lack cohesion and cannot be specifically adjusted to suit particular room conditions. It's also unnecessary for sound to be focussed in places where there is no audience. This sound often reflects off areas like the ceiling, causing a delay on its return. To the listener, this kind of reflection can make the sound appear "washy" or "roomy", with a noticeable deterioration in speech intelligibility. In this respect, the Linea Focus series is revolutionary: Specifically targeting the sound means that unwanted room reflections can be avoided.

2. Real-time sound control
Perfect control equals perfect results. Fohhn's user-friendly software enables real-time control of the speakers' sound dispersion characteristics. This allows sound to be focussed quickly and accurately on each particular audience area, giving outstanding results with both fixed installations and live performance systems. With most sound projects, time is often a decisive factor in determining their eventual success or failure. Because the loudspeaker system is invariably installed at the end of a construction project, or live set-up, time may be limited to quick and rudimentary adjustments and sound checks. Being able to control the sound dispersion in real-time makes the set-up considerably easier.

3. Even sound distribution
With Linea Focus, even sound distribution is guaranteed throughout the venue, from warm, pleasant sound at the front, to clarity and detailed intelligibility right at the back. What's more, significantly fewer speakers are required to achieve perfect room coverage. As a true line array system, Linea Focus produces its sound in the form of a cylindrical wave. Unlike conventional systems, the sound pressure level within the cylindrical wave only decreases by 3 dB, instead of 6 dB, as the distance doubles. This groundbreaking feature, combined with the ability to electronically control the speakers' sound dispersion, has set new standards in sound quality. For planning ingenieurs we offer a plugin (DLL) of Fohhn Audio Soft for EASE acoustic simulation program.

4. Outstanding reproduction of speech and music

Linea Focus also establishes a new benchmark for the reproduction of speech and music. The high-powered speakers' exclusive development and innovative digital technology produces a dynamic, natural sound quality. Speech, AV productions and live music are all superbly reproduced with Linea Focus systems. Each separate loudspeaker is individually equipped with one of the latest generation CLASS D DSP amplifiers, producing 100 W path power per channel. A Linea Focus LFI-450 system, for example, has 3200 W of available amplifier power.

If higher bass sound pressure levels are called for, the Linea Focus system can easily be combined with a Fohhn active or passive subwoofer. To target sound more effectively in the low frequency range, it's also possible to create a bass array by combining several subwoofers and their related DSP technology.

The Linea Focus systems' extraordinary electronic control capabilities also allow the speakers to be used in combination with Fohhn subwoofer systems. Electronically steering each separate DSP-controlled subwoofer enables more precise control of its sound dispersion characteristics. This in turn gives a more even reproduction of low frequencies, which significantly improves the overall sound image.

5. Integration into any architectural setting

Designed for perfection, the slim, elegant Linea Focus speakers integrate into any setting. Housings are available in all standard RAL colours. The speakers' electronic control functionality enables them either to be mounted flat against the wall, or installed directly in the wall to blend unobtrusively with the room interior. Only the most important things will be noticed: the room and the sound.

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TECHNOLOGY BY FOHHN®

THE LINEA FOCUS PRODUCT FAMILIY.

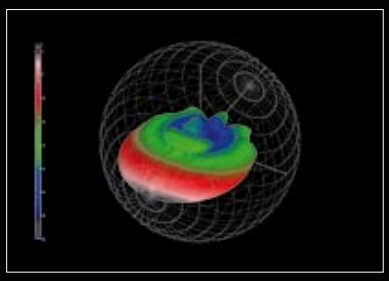
The next generation of electronically steerable line array systems.

4.5 m
Linea Focus LFI-450

3.5 m
Linea Focus LFI-350

2.2 m
Linea Focus LFI-220/LF-220

1.2 m
Linea Focus LFI-120/LF-120



Fohhn Linea Focus 3D Directivity Balloon

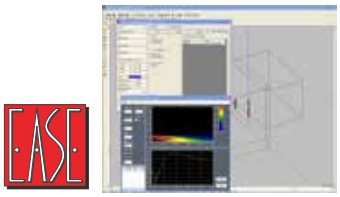
ENGINEERED FOR ARCHITECTURE AND LIVE SOUND.

Even sound distribution

With Linea Focus, even sound distribution is guaranteed throughout the venue, from warm, pleasant sound at the front, to clarity and detailed intelligibility right at the back. What's more, significantly fewer speakers are required to achieve perfect room coverage. As a true line array system, Linea Focus produces its sound in the form of a cylindrical wave. Unlike conventional systems, the sound pressure level within the cylindrical wave only decreases by 3 dB, instead of 6 dB, as the distance doubles. This groundbreaking feature, combined with the ability to electronically control the speakers' sound dispersion, has set new standards in sound quality.

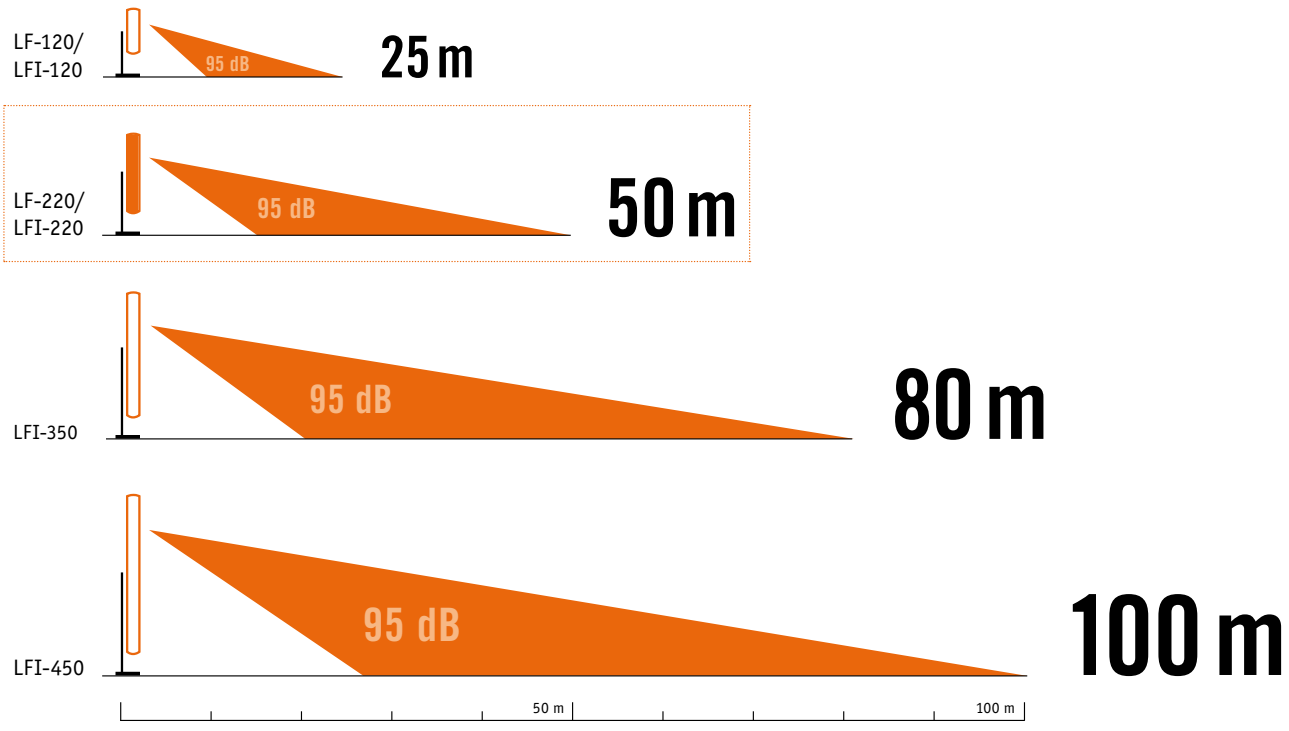
Planning support

For planning ingenieurs we offer a plugin (DLL) of Fohhn Audio Soft for EASE acoustic simulation program.
For further information, please contact our planning engineers on info@fohhn.com.



The different lengths of the Linea Focus models determine their acoustic efficiency. The longer the line array, the longer its reach and also its effectiveness in the control of low frequencies.

SIZE MATTERS.



Range at 95 dB SPL.

Fixed Installations

Airports, churches, railway stations, conference centres, theatres, TV studios, university lecture rooms, exhibition halls, museums etc.

The Linea Focus LFI series has been specially developed for venues that demand both powerful sound reproduction and visual integration. The new 4.5 m length is a recent innovation – rarely seen on the market. Its numerous speakers generate superb coverage over impressive distances.

In reverberant acoustic conditions, excellent results can be achieved by focussing the speaker sound to avoid "exciting" the room acoustic, guaranteeing superb speech intelligibility. The electronically steerable capabilities of the new systems allow them either be mounted flat on the wall, or installed directly in the wall.

An international study by Prof. Dr.-Ing. Jürgen W. Meyer (Physikalisch-Technische Bundesanstalt, Germany) has revealed that historical churches often have long reverberation times in the particular frequency range relevant to speech. Strong reverb considerably reduces speech intelligibility. Here however, Linea Focus proves a real problem solver. By targeting the sound directly towards the audience, speech intelligibility is significantly improved.

System integration in accordance with EN 60849

Important features for system integration as per DIN EN 60849/ VDE 0828

Regulations on Places of Assembly (sound systems for emergency purposes):

- 2 line inputs with balanced transformers (including pilot tone for redundant use)
- fault message contact for analog evaluation of the operating status
- monitoring and intelligent evaluation of all important device parameters

1. Inputs / outputs (Phoenix terminals)

Input 1 (standard input without pilot tone monitoring):

- standard line input with high-quality, balanced, isolated input transformer

Input 2 (only for applications with pilot tone monitoring):

- additional line input with pilot tone monitoring and high-quality, balanced, isolated input transformer
- Present pilot tone can be evaluated.

Use with pilot tone, without redundant wiring

- Input 2 has a higher priority level and is permanently active due to constant pilot tone (> -30dBV).
- In this case input 1 is not in use and remains inactive/muted.

Use with pilot tone and redundant wiring

- Identical signals for both inputs are required.
- Input 2 has a higher priority level and is permanently active due to constant pilot tone (> -30dBV).
- Input 1 remains muted.
- If the signal to input 2 - and thus the pilot tone - is interrupted, the signal from input 1 will be used automatically.
- With an identical audio signal on both inputs, an interruption of the signal is not perceived.
- This switchover happens automatically and cannot be configured.
- Therefore redundant wiring is possible.

2. Mains connections 100 - 240 V /50/60Hz

- **2 pin Phoenix terminal**
- **grounding screwed**

3. Fault message contact

- **Pilot signal monitoring**
- **relay 2x alter**
- **link terminal**
- **Monitoring of all important device parameters**
- **Intelligent evaluation**

The following faults can be monitored and displayed:

- Faults relating to the internal voltage supply
- Overheating
- Short-circuit of the amplifier outputs
- Shutdown of the amplifier outputs due to earth or voltage problems
- Short-circuit of the speaker chassis
- Chassis overload (after measuring the impedance, in preparation)
- Pilot signal monitoring signal missing from Input 2 (configurable)
- Network errors (each message is confirmed)

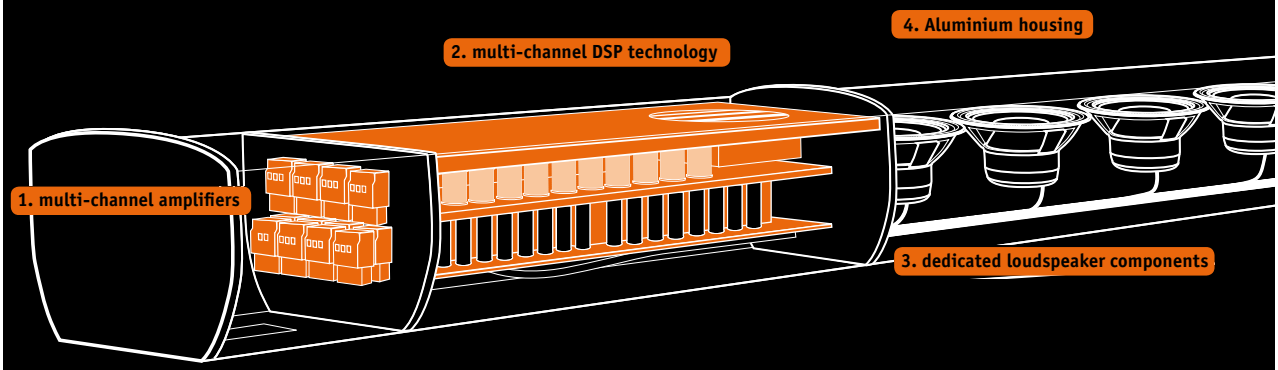
Fault messages are indicated and displayed via the following:

- Fault contact (relay 2x alternate, link)
- Red flashing LEDs (built into input circuit board)
- Status messages in Fohhn Audio Soft
- Error messages via RS-485 and Ethernet (accessibility to other systems available)

TECHNOLOGY BY FOHHN®

INSIDE LINEA FOCUS.

MADE IN GERMANY. MADE BY FOHHN.



1 Fohhn CLASS D multi-channel amplifiers

State-of-the-art digital amplifier technology – made in Germany. Equipped with 8/16/24/32 separate amplifier channels and specially developed to allow individual control of each loudspeaker chassis. 100 W path power per channel. Superb sound characteristics and extremely high efficiency levels. Minimum heat generation. Maximum operating reliability.

2 Fohhn multi-channel DSP technology

Up to 32 separate DSP channels enabling individual loudspeaker control. Latest DSP processors: 24-Bit AD converter, filter depth 56 Bit, sampling rate / fine tilt control, 96 kHz, latency 0.6 ms. Ultra-fine, precise control in 0.1° steps up to 15 kHz. Integrated, freely-configurable audio devices including parametric EQ, dynamics, delay, noise gate, hi pass / low pass, status monitoring. All settings can be saved as presets.

3 Fohhn dedicated loudspeaker components

Manufactured especially for Fohhn. Extremely high-performance 4" loudspeakers equipped with the latest neodymium drivers and plastic coated membranes. Excellent reproduction in all frequency ranges – bass, mid and high. Exceptionally powerful top end performance, not normally possible with conventional high-frequency drivers.

4 Aluminium housing

Fohhn's high quality aluminium housing is extremely elegant and robust, offering optimum protection for all internal components. Black anodized housing is supplied as standard. Other RAL colours are available on request.

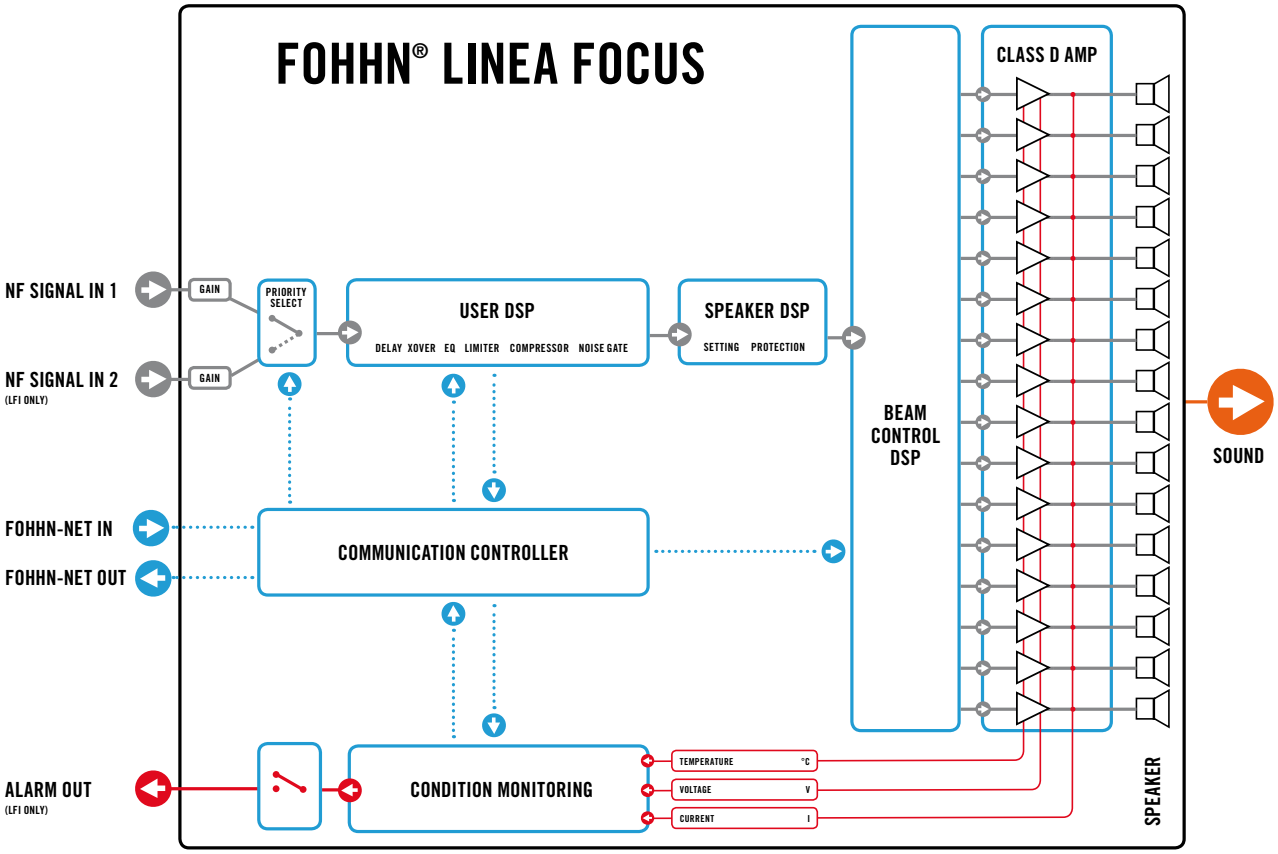
The main operating principle

Operating a Linea Focus system is easy, even though there are highly complex processes integrated into both the technology and the software.

The diagram gives more experienced readers an overview of the functionality. An input signal initially passes through the input section. This has a priority logic that is activated if an evacuation announcement is necessary for example, ensuring maximum safety in any kind of emergency. The input signal also passes though a digital signal processor, which offers a range of opportunities for real-time processing. This is done easily and intuitively using Fohhn Audio Soft software. The "Speaker Setting and Protection DSP" section includes all the necessary acoustic protection mechanisms, such as a finely tuned multiband limiter. Equalizer settings, for the array correction for example, can also be stored.

The system is continually optimized to deliver excellent acoustic results and maximum operating reliability, even under difficult conditions. At the heart of the Linea Focus system is the "Beam Control DSP" display, which includes all the algorithms for calculating the beam characteristics. Any parameter changes made by the user in the software are then sent to the Beam Control DSP, which calculates the data and relays the appropriate information to each separate speaker.

Each chassis is controlled via an individually calculated signal from its own Class D power amplifier. Constant monitoring of the state of each individual output signal and component, such as temperature, current and load, means that the present operating status is always displayed and can be read by the user.



Fohhn Audio Soft

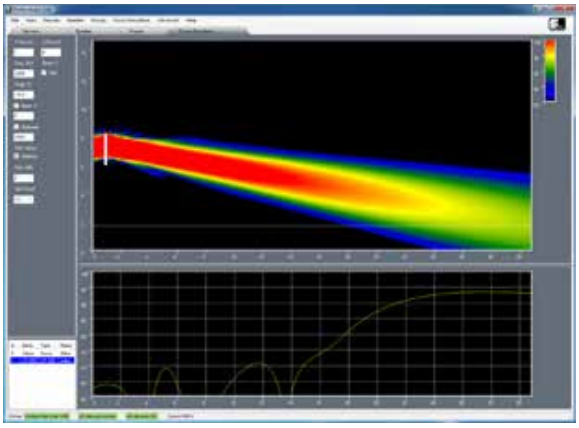
Intuitive, real-time control. All settings can be safed as presets.
Innovative technology and its related software have been developed in tandem by Fohhn's engineering team. No other software program is needed. Everything can be controlled from a single application – Fohhn Audio Soft – running on a laptop. The software can be downloaded free of charge from: www.fohhn.com.

The transparent, graphic user interface allows quick access to the connected audio devices, sound presets and the Linea Focus simulation. All settings can be saved as presets. Signal processing is always done in real time. Operating status, time and temperature can also be controlled via the software. The system components and laptop can either be linked via Fohhn USB adapter or Fohhn Ethernet adapter. Up to 256 devices can be networked together.

Linea Focus Simulation

At the Heart of Fohhn Audio Soft.
At the heart of Fohhn Audio Soft is the Linea Focus Simulation. The unique integration of control and simulation allows the immediate transfer of parameter settings to the connected devices. All parameter changes made in the simulation window are transferred to the devices in real time. Changes to the sound inclination angle or beam width are instantly audible. The vertical sound inclination angle can be adjusted between +40°/-40° and the vertical beam width between 0° to 90°.
The simulation of the line array's sound dispersion characteristics lies within a frequency range of 50 Hz – 20 kHz. The spatial distribution of the sound pressure level is displayed in graded colours.
The frequency response at any given position, and the sound pressure level for any area of the audience, can be displayed on a graph. Optimizing the sound dispersion characteristics can always be done in real time. Using a laptop with WLAN lets the user move around, quickly assess and optimize the sound in each part of the room, before comparing it again with the simulation.

Configuration
To configure the Linea Focus the Fohhn Audio Soft is indispensable. For connecting it to a PC the Fohhn-Net Adaptor NA-11 or NA-3 is necessary.



Intuitive beam control in real time.
All settings can be saved as presets.

The software can be downloaded free of charge from:
www.fohhn.com / Downloads

TECHNOLOGY BY FOHHN®

DSP AND SOFTWARE
TECHNOLOGY

Electronically controlled sound dispersion

The „acoustic beam/focus“ position and the beam width can be adjusted vertically using Fohhn Audio DSP technology combined with Fohhn Audio Soft without having to steer the speakers mechanically. These features open up a whole new range of opportunities to sound planners and integrators for the discreet visual integration of speakers into the room architecture.

The first scientific analysis of the sound dispersion characteristics of speaker arrays were performed as early as the 1920s. Unfortunately DSP technology had not yet been invented at that time. (Publication: Wolfe, I. & Malter, L., „Directional Radiation of Sound“, J. Acoustical Society of America, volume 2, number 2, p. 201 (1930).)

Overlapping sound sources such as a closely arranged series of speakers inside a vertical housing (e.g. in a line array speaker) results in the vertical concentration of sounds over a large frequency range. The taller the line array speaker, the more accurately sounds can be concentrated, irrespective of the frequency. As a result, Linea Focus systems are available in different lengths.

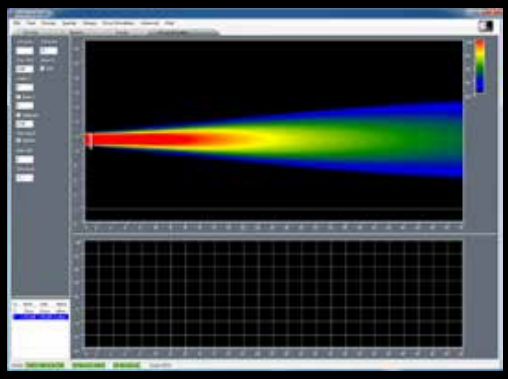
If each individual speaker within this line array speaker is controlled electronically, the directional characteristics can also be manipulated, which allows the „acoustic beam/focus“ to be steered. However, the interactive optimisation of the sound dispersion characteristics in realtime, for example, requires highly complex technology.

Sub arrays

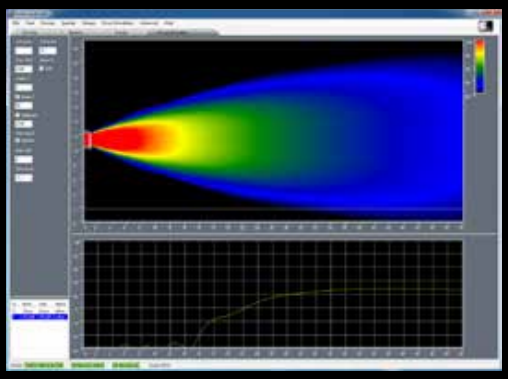
In the future it will be possible to calculate and electronically control specific dispersion characteristics of clusters consisting of subwoofers using Fohhn Audio Soft control and simulation software combined with Fohhn® DSP amplifiers.

Listening experience

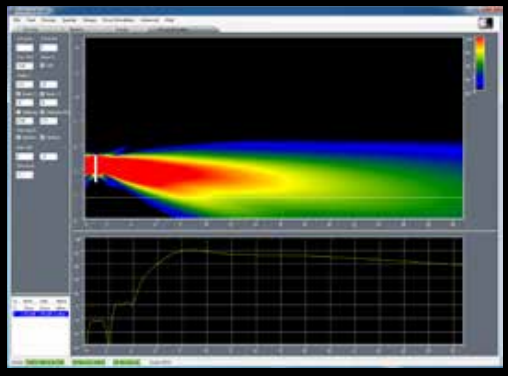
We would be glad to demonstrate the features of our Linea Focus systems to you. Experience specific, precision sound dispersion with the Linea Focus!



Vertical dispersion of 0 degrees



Vertical dispersion of 60 degrees

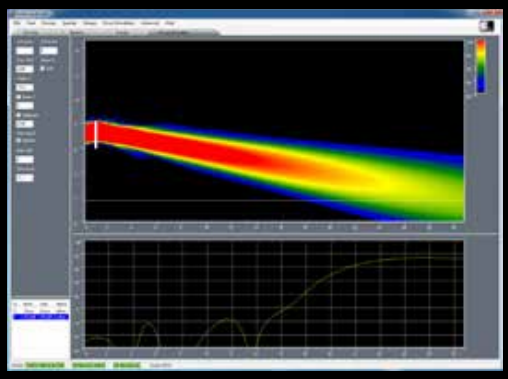


Asymmetrical Beam

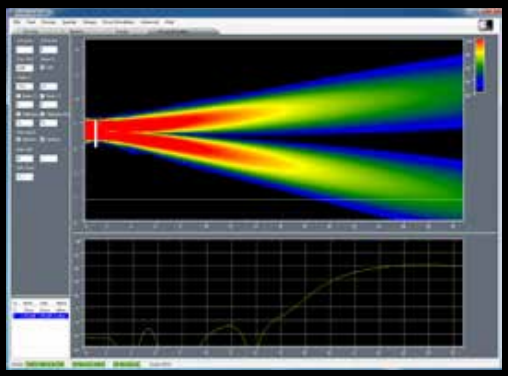
TECHNOLOGY BY FOHHN®

TWO BEAM
TECHNOLOGY

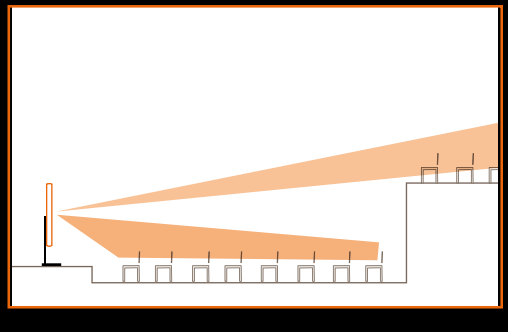
The Linea Focus system with “two beam technology” developed by Fohhn can generate 2 dispersion beams in the vertical dispersion range. A speaker system can direct sound at a specific area of the dance floor or gallery as a result.



1 Beam

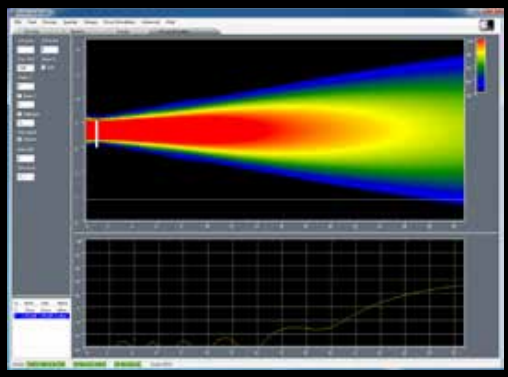


2 Beams

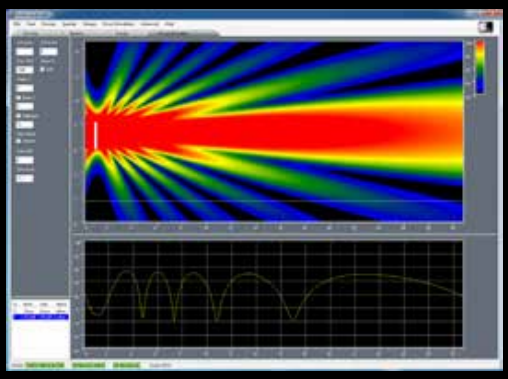


SIDE LOBE FREE
TECHNOLOGY

This specially developed algorithm can suppress unwanted side lobes.



Beam without Side Lobes



Beam with Side Lobes

Optional subwoofer

Fohhn® DSP processor technology modulates the Linea Focus and Fohhn subwoofers perfectly. Digital Fohhn signal processors are integral components of active Fohhn subwoofers, Fohhn DSP amplifiers and Fohhn DSP controllers. DSP-controlled Fohhn devices can be controlled remotely from a central location in the room or on the 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.

Connections

All connections are placed inside the housing of the LFI-220 behind an easy accessible service flap in front. That means that all cables are implemented by the rear cable inlet into the housing. So the cables can be connected to the Phoenix teminals very comfortable from the front. No cable is visibleon the outside. The internal cord grip guarantees a save operation.

DIGITAL CONNECT - Optional Input Extensions

In addition to standard audio inputs different extensions are available. To distribute multi-channel digital audio and control data at the same time, either CAT5 or optical fibre can be used. These **OPTOCORE** extensions provide excellent audio quality, entire control of the speaker and facilitate reliable and redundant digital audio network.

OPTOCORE

Scope of benefits at a glance

+ 8, 16, 24 bzw. 32 integral digital amplifiers and digital signal processors (depends on the speakers´s length)
+ Beam control in realtime
+ Side Lobe Free Technology
+ Vertical dispersion control function
+ movable acoustic centre
+ Two beam technology
+ Integral protective circuits for maximum operating safety
+ High degree of speech intelligibility in rooms with difficult acoustics
+ Suitable for reproduction of music using Fohhn subwoofers in a system
+ Aluminium housing with slim, discreet design
+ Low weight
+ No mechanical steering of speaker necessary
+ Discreet integration in the room architecture
+ Integral DSP control for:
  + Vertical dispersion monitoring
  + Beam angle
  + Inclination angle
  + Acoustic focus
  + 10-band fully parametric equaliser
  + Volume control
  + Internal Delay up to 350 ms / 120 m
  + Customised preset selection
  + Compressor/limiter
  + Extensive group functions
+ Fohhn-Net Remote connection
+ Intuitive operating software Fohhn Audio Soft for configuring all parameters and focus simulation
+ Option of integration in media controls
+ Complex remote control and monitoring via Fohhn Net
+ Comprehensive range of mounting accessories
+ For fixed installation
+ Easy servicing due to superior design
+ Green Power Standby Mode
+ German Quality - Engineered and made by Fohhn®
+ System integration in accordance with EN 60849 (emergency and fire evacuation)

+ Digital Network Integration OPTOCORE: Optional Input Extensions for MADI over CAT5 and optical fibre

Technical specifications LFI-220

electro-acoustical features	
acoustic design	electronically steerable line array speaker
components [*]	16x 4" impreg. speaker membranes (fully neodymium)
operating mode	active, 16-channel DSP amplifier, class D
sensitivity[4]	112 dB
power rating (peak)[3]	130 dB
frequency range[5]	60 Hz - 17 kHz
nominal dispersion [6]	
horizontal	110°
vertical dispersion, electronically steerable	0°- 90° in 0.1° steps
vertical sound inclination angle, electronically steerable	-40° - +40° in 0.1° steps
Acoustic centre	For both beams this can be set anywhere from 0% (at the bottom of the column) to 100% (at the very top)
features	
enclosure	Aluminium design
protection grille	ball impact resistant metal, powder coating
suspension points	6x M6 thread
standard colours	black or white powder coating
front design	metal grille in enclosure colour
dimensions (W x H x D)	130 x 2250 x 120 mm
weight[7]	15 kg
optional features	
optional colours	all RAL-colours

electronic performance	
amplifier output	16x 100 W
amplifier type	Pure Path Digital PWM
audio inputs	1x standard line input, with balanced transformers, isolated 1x additional redundant line input, with pilot tone monitoring, prioritized, with balanced transformers, isolated Optional Input Extensions OPTOCORE: MADI over CAT5 and optical fibre
audio outputs	2x links
DSP channels, Fohhn Audio DSP	16
amplification	25 dB
input sensitivity	1,4 V
frequency response	20 Hz - 20 kHz
S/N Ratio	>105 dB/A
protective circuit	soft start, temperature monitoring, short-circuit protection, overload
power supply	100 V - 240 V AC 4A 50/60 Hz power supply with Power Factor Correction
current consumption	standby 5 W, max 800 W
low power	Green Power Standby Mode
temperature range	0 - 40°C
cooling	temperature-controlled fan
weight electronic	ca. 3 kg

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

remote control, remote monitoring and simulation	
remote control	Fohhn-Net, Fohhn Audio Soft
remote monitoring	temperature, protect, signals, power supply Fohhn-Net, Fohhn Audio Soft
Pilot signal monitoring	
fault message contact	relay 2x alter
simulation beam	Fohhn-Net, Fohhn Audio Soft

controller	
digital signal processors	2
independent limiters	4
selective 3-band limiting	bass/ mid/ high
band specific time constants	
filter technology	56-bit double precision
AD	24 bit/ 96 kHz
FIR filters	
gain	-80 dB - +12 dB
volume	-80 dB - +12 dB
EQ	10-band parametric EQ gain +/-12 dB frequency range 10 - 20 kHz Q 0,1 - 100
limiter compressor	
noise gate	
X-Over	Linkwitz-Riley 4. order 24 dB/ octave high pass 10 Hz - 20 kHz low pass 10 Hz - 20 kHz
delay	0,01 - 350 ms, or 3,4 mm - 120 m

connections (built-in Phoenix terminals)	
Fohhn-Net	2x in/ thru Phoenix terminals
mains connections	2 pol Phoenix terminal, grounding screwed
audio inputs	2x in Phoenix terminals
audio outputs	2x link Phoenix terminals
fault contact	relay 2x alter, link Phoenix terminals

indicate LEDs (built-in)	
power on/ off (standby)	green = on, red = standby red flashing = fault
network control	receive/ send remote control LED

CAAD simulation data	
simulation data	EASE

[3] 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

[7] net weight without optional equipment

Power specification LFI-220

U=230VAC	Operating conditions	Power Current (A)	Power Watt ohmic	Power VA
Standby		0.24	9,1	56
Idle no Signal		0.25	**11**[4]	60
Idle with signal -50dBV		0.28	26	65
Maximum average power[3]	Beam Optimize, Sin 200Hz	1.08	240	**248**[4]
Maximum average power	Beam Optimize, PinkNoise	0.66	140	152
Maximum average power	Sin 200Hz	1.44	300	334
Peak Power	Sin 200Hz, 1s	2.08	460	480
Inrush Current	without ZCS[1]	50A	1.5ms	
	with ZCS	25A	3ms	
	with FZCS[2]	5A	<30ms	

[1] ZCS = Zero Crossing Switch

[2] FZCS = Fohhn Zero Crossing Switch with current limit

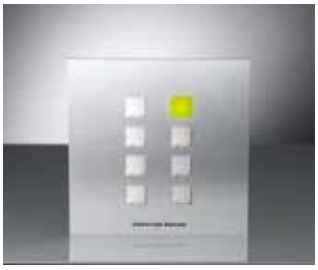
[3] optimized for speech intelligibility in reverbarated acoustics (airport, train station, stadium..)

[4] **Recommended values for UPS design**

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

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 32 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

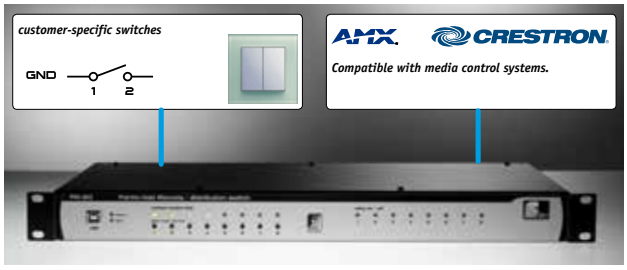
Two terminal strips (paralelled). Alternative connection via standard 4-wire telephone cable.

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.

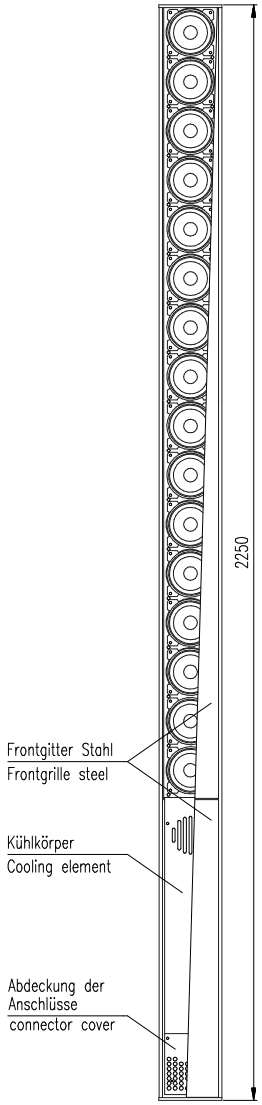
Integration in a EIB bus technology

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.

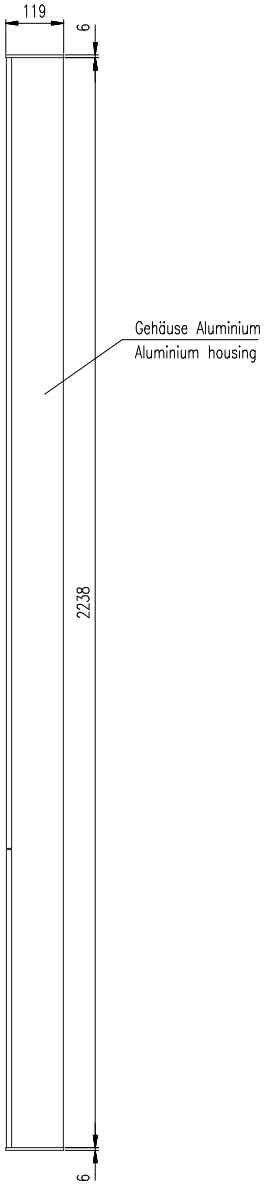
Applications

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.

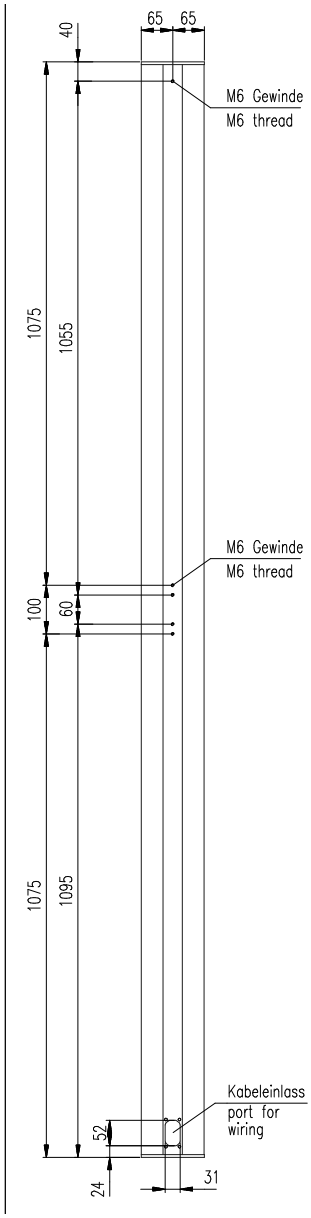
Front view



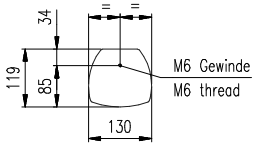
Side view



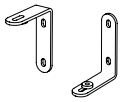
Rear view



Top view = Bottom view

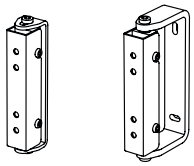


WAL-1
Pair of L-brackets for Linea LFI-120/220



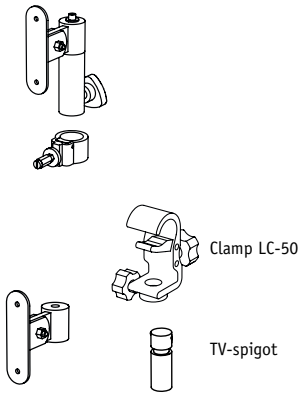
WLF-1
Wall bracket for Linea LFI-120/220/350*/450* and LF-120/220

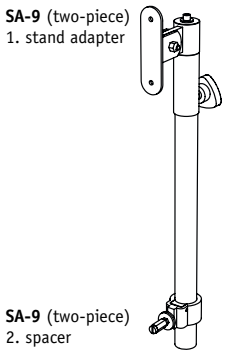
WLF-2
Wall bracket for Linea LFI-120/220/350*/450* and LF-120/220



SA-9
Reducing flange, 36mm dia, for Linea LFI-120/220 and LF-120/220, two-piece with spacer, black

SA-10
Flying adapter for traverse mounting e.g.
with optional Clamp LC-50 and TV-spigot with M10 female thread, black,
for Linea LFI-120/220 and LF-120/220





NA-11 Fohhn-Net Adapter
USB adapter and Fohhn Audio Soft on CD Rom.
Extensionable with XLR microphone cable.
Aluminium housing and adapter cable.

Overview accessories

	WAL-1	WLF-1	WLF-2	SA-9	SA-10	Carrying bag
LF-120		x	x	x	x	x
LF-220		x	x	x	x	
LFI-120	x	x	x	x	x	x
LFI-220	x	x	x	x	x	
LFI-350		x*	x*		x	
LFI-450		x*	x*		x	

* For secure mounting of LFI-350/450 two pieces of WLF-1/2 are necessary!

Linea Focus Free Stand Designer Stands

PERFECT STAND. PERFECT LOOK.

Whether for fixed installation or mobile use, Fohhn's Free Stand designer loudspeaker stands ensure that Linea Focus systems integrate perfectly into any room architecture.

A large detachable base, an elegant plinth or a Fohhn subwoofer will all provide the necessary support for the stand, the stand is available in three heights:

* Free Stand IX – 0.60 m
* Free Stand X – 1.25 m
* Free Stand XI – 2.25 m

Speaker cables can be concealed within the stand itself. The base has a series of connection sockets, which are covered. This allows the cabling to remain "invisible".

* Perfect integration into any room architecture
* Elegant, unobtrusive design
* Sturdy, safe support for Linea Focus speakers
* Quick assembly
* Excellent workmanship "Made in Germany"
* Available in the same RAL colours as loudspeakers

FREE STAND IX / X / XI

Stand LF-1
Large detachable base, designed for use with the stand column IX/X/XI, Linea Focus

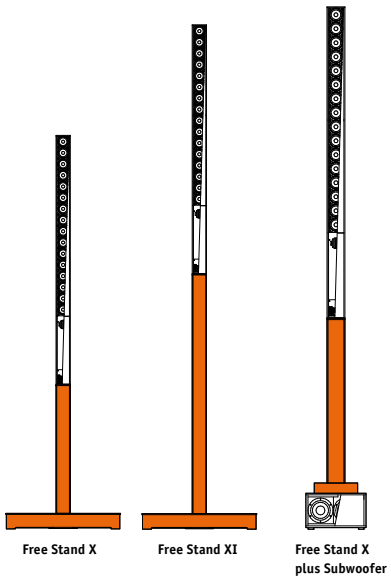
Stand LF-2
Wooden plinth, smooth finish, designed for use with the stand column IX/X/XI, Linea Focus

Sub Adapter LF-3
Steel plate with M20 screws for connecting the stand column IX/X/XI auf Fohhn Subwoofer, Linea Focus

Free Stand IX
Aluminium stand column, 60 cm length, for use with Linea Focus systems

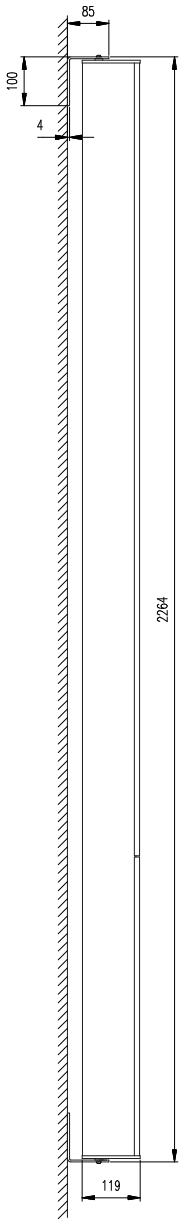
Free Stand X
Aluminium stand column, 125 cm length, for use with Linea Focus systems

Free Stand XI
Aluminium stand column, 225 cm length, for use with Linea Focus systems

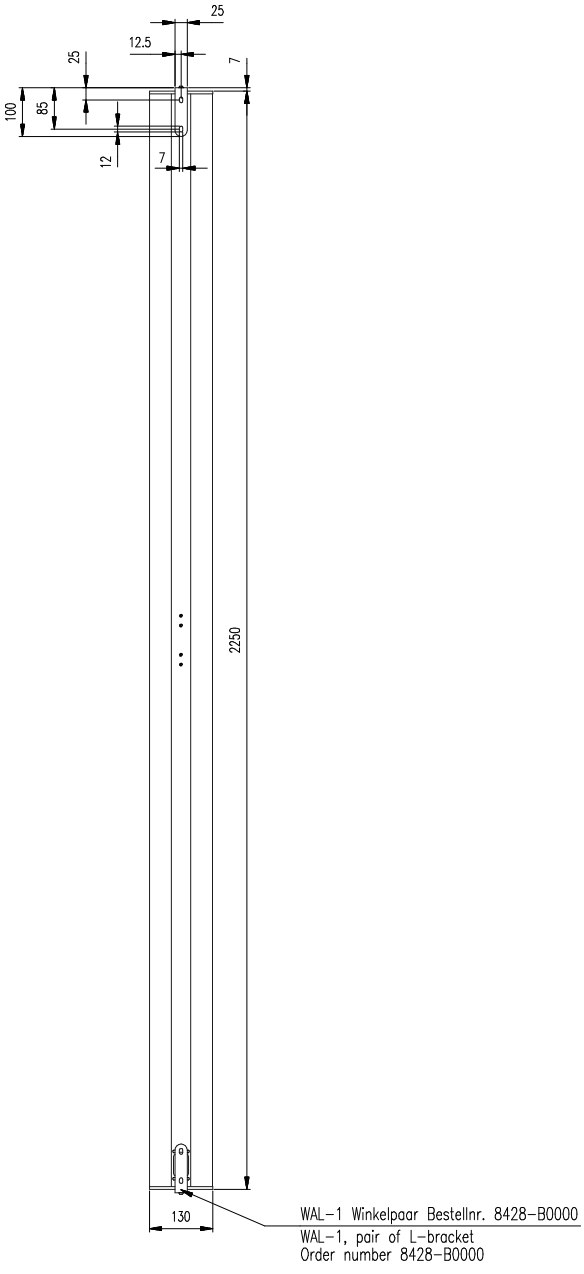


Wall mount

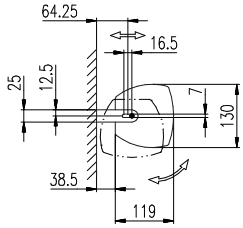
Side view



Rear view

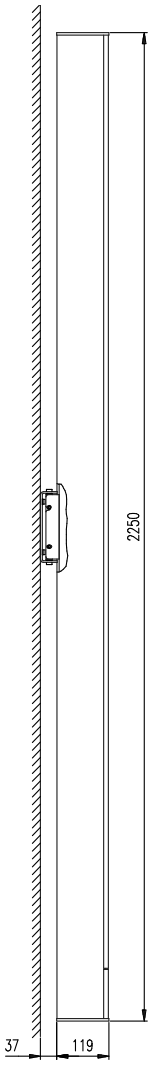


Top view = Bottom view

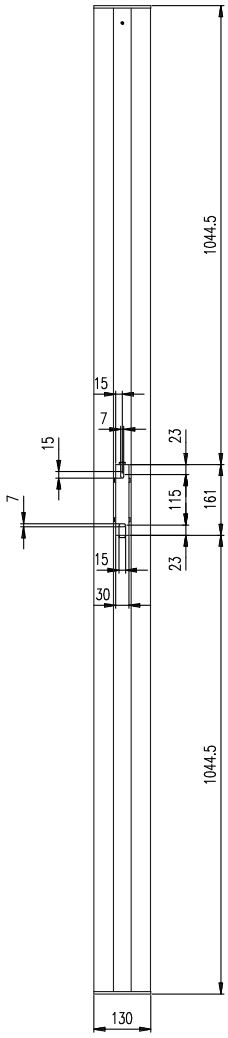


Wall mount

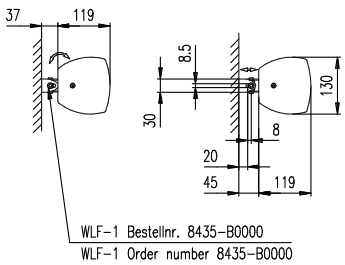
Side view



Rear view

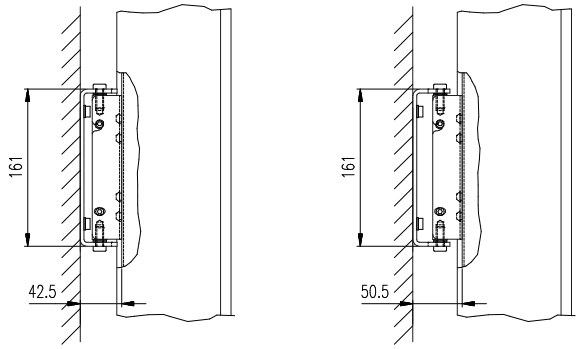


Top view = Bottom view

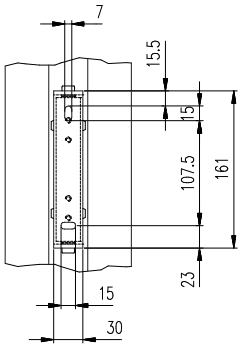


Wall mount

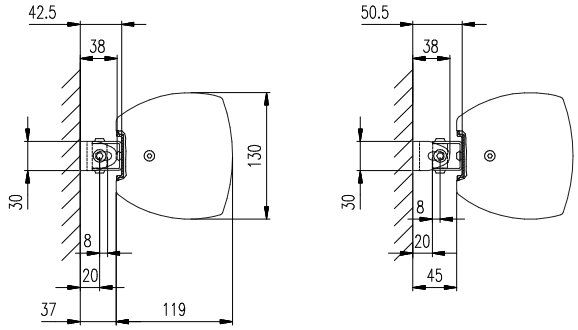
Side view

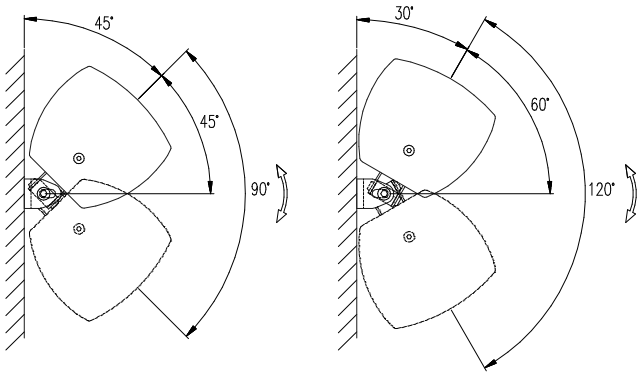


Rear view



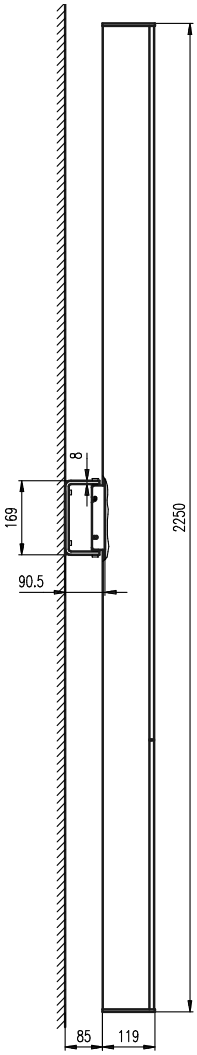
Top view = Bottom view



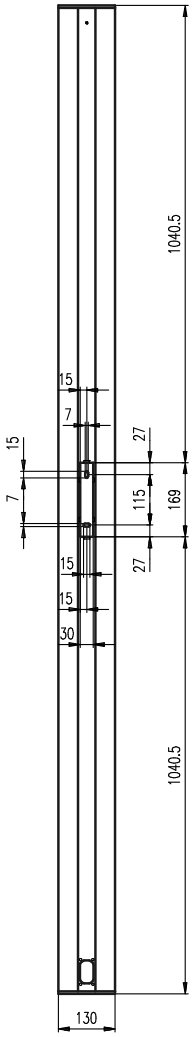


Wall mount

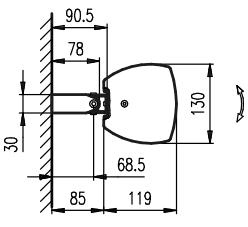
Side view

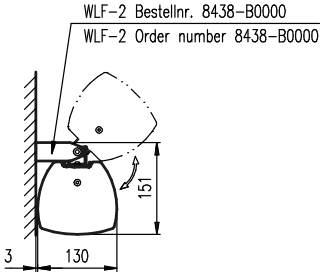


Rear view



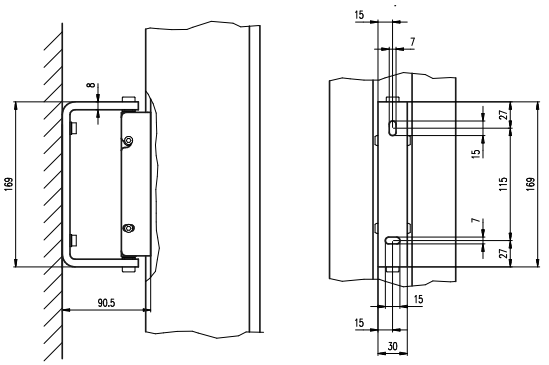
Top view = Bottom view



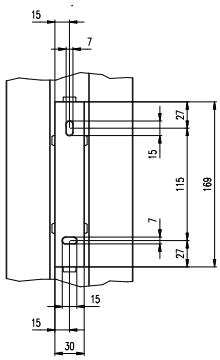


Wall mount

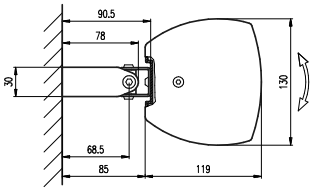
Side view

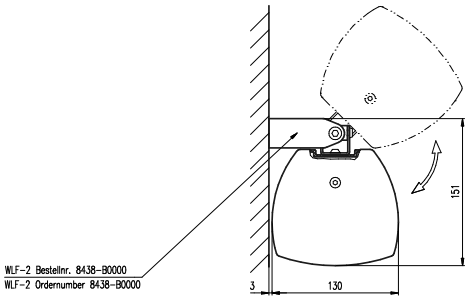


Rear view



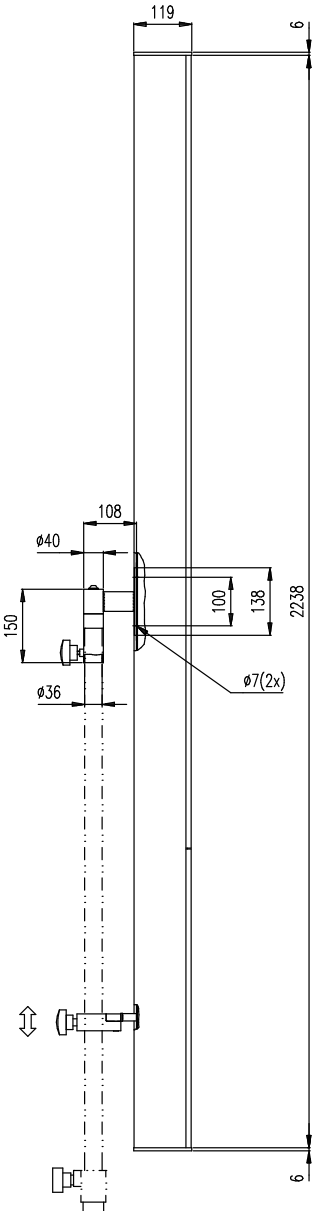
Top view = Bottom view



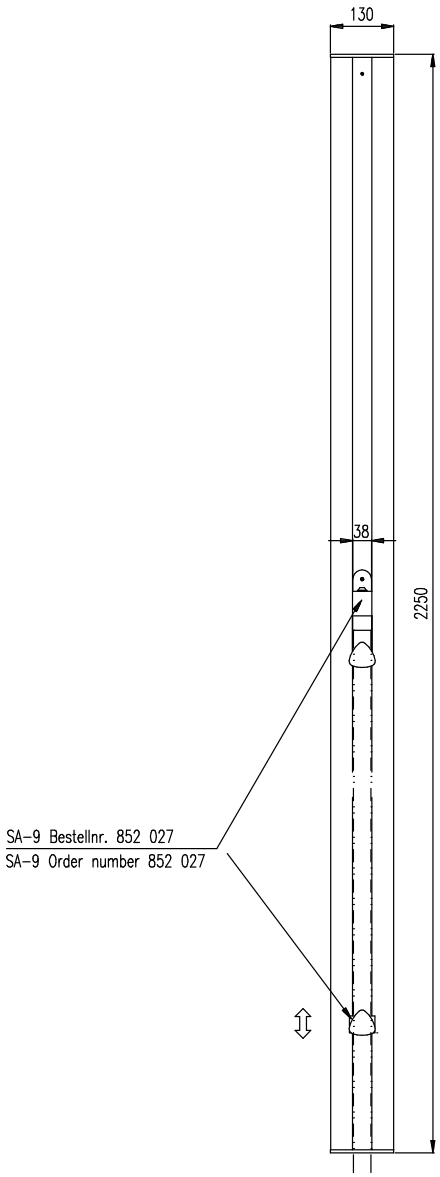


Stand mount

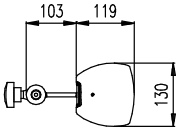
Side view



Rear view

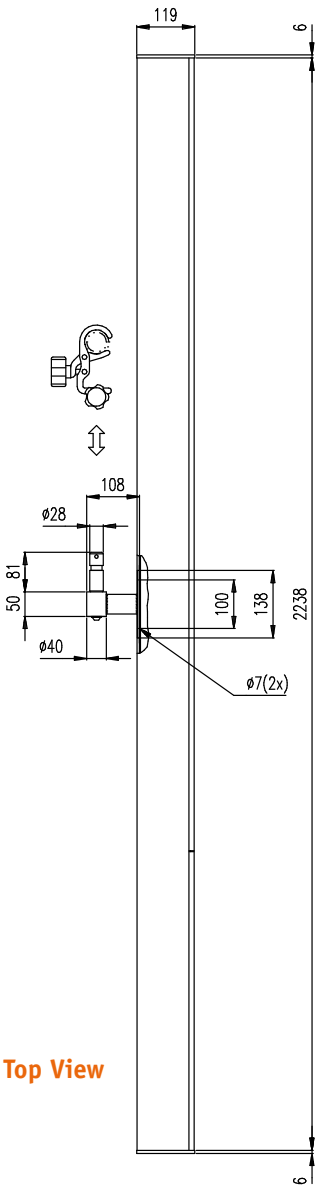


Top View

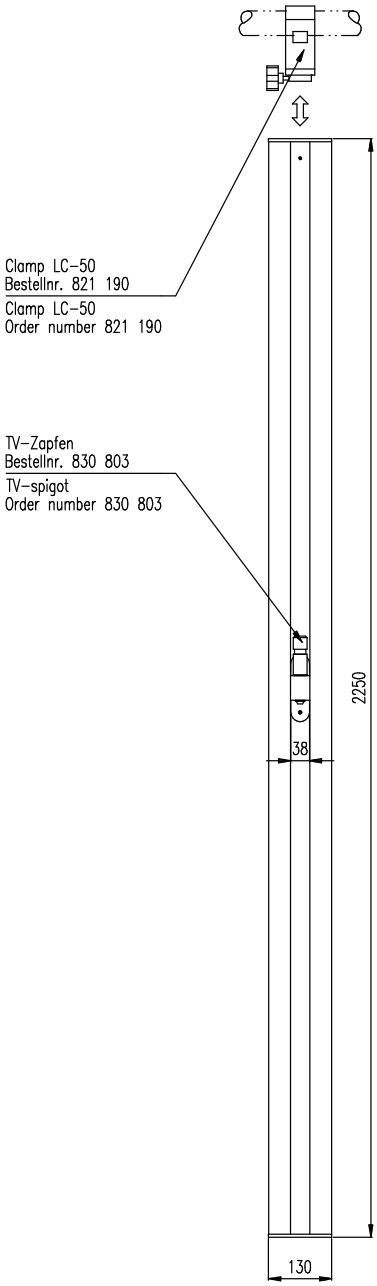


Flying adapter

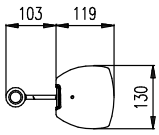
Side view



Rear view



Top View



Electronically steerable active line source speaker for fixed installations

Powerful active, electronically steerable line source speaker with aluminium enclosure, equipped with sixteen coated, long stroke 4" – drivers and digital 16-channel DSP amplifiers. Because of the application of neodymium chassis and an aluminium enclosure, the speaker remains light with only 15 kg. Perfectly suited for dynamic speech- and music transmissions in rooms with demanding acoustics, long reverberation times and challenging architecture. The sixteen integrated digital amplifiers with 100 W each generate acoustic pressure of maximal 130 dB. The speaker has a wide frequency range of 60 Hz to 17 kHz. The horizontal dispersion of 110° and the adjustable vertical sound inclination angle of 0° to 90° in steps of 0,1° allow an exact adjustment onto the audience. The inclination angle of the beam can be adjusted from + 40° to - 40° in steps of 0,1°. The Linea Focus system can generate two dispersion beams and is therefore able to reach additional areas such as galleries. It is possible to high-pass filter the beams separately. The acoustic centres of both beams can be set anywhere from 0% (at the bottom of the column) to 100% (at the very top), making the speaker suitable for use in the most challenging acoustic conditions. Unwanted side lobes which occur because of interferences are suppressed effectively through a specially developed Optimize-Algorithm. The loudspeaker is equipped with pilot signal monitoring allowing its integration in emergency evacuation systems. The following faults can be monitored and displayed: Faults relating to the internal voltage supply; overheating; short-circuit of the amplifier outputs; shutdown of the amplifier outputs due to earth or voltage problems; short-circuit of the speaker chassis; chassis overload (after measuring the impedance, in preparation); pilot signal monitoring missing from Input 2 (configurable); network errors (each message is confirmed). Fault messages are indicated and displayed via the following: Fault contact (relay 2x alternate, link); red flashing LEDs (built into input circuit board); status messages in Fohhn Audio Soft; error messages via RS-485 and Ethernet cannot be read (accessibility to other systems available). The loudspeaker system also has automatic priority switching to Input 2. (If an audio signal of over 30 dB is detected at Input 2, Input 1 is automatically shut down and Input 2 activated. This also enables a system to be created with two redundant audio inputs.). The adjustment and monitoring of all parameters is controlled in real time with Fohhn Audio Soft. The handling is easy and intuitive done via mouse click. The dispersion of the speaker, the sound level and the frequency are graphically visualized. 2 symmetrical transformers, independent line inputs, alive contact for analogue evaluation of the operating status, control and intelligent evaluation of all important parameters. Optically appealing, slim and inconspicuous aluminium enclosure with rounded sides, available in black or white powder coating. Optional available in all RAL-colours. For the protection of the speaker chassis and the electronics, the enclosure is equipped with a ball impact resistant, extremely sound-permeable front grille, which is made of powder-coated steel as well as a moisture- and dust repellent acoustic fleece. Highly efficient Green Power supply with a maximum activity input of 5 W in stand-by mode. Six pieces M6 thread applications are integrated to the admission of system brackets. Connections: internal Phoenix terminal and a cable duct on the back: 2x NF in, 2x NF through, 1x power supply, 2x Fohhn-Net Remote. Specific brackets to assemble the system on ceilings, walls, traverses and stands are optionally available. Simulation data CAAD for EASE available.

-----> episode

electro-acoustical features

acoustic design	electronically steerable line array speaker
components	16x 4“ impreg. speaker membranes (fully neodymium)
operating mode	active, 16-channel DSP amplifier, class D
sensitivity	112 dB
power rating (peak)	130 dB
frequency range	60 Hz - 17 kHz
nominal dispersion horizontal	110°
vertical dispersion, electronically steerable	0°- 90° in 0.1° steps
vertical sound inclination angle, electronically steerable	-40° - +40° in 0.1° steps
acoustic centre	for both beams this can be set anywhere from 0% (at the bottom of the column) to 100% (at the very top)

features

enclosure	aluminium design
protection grille	ball impact resistant metal, powder coated
suspension points	6x M6 thread
standard colours	black or white powder coated
front design	metal grille in enclosure colour
dimensions (W x H x D)	130 x 2250 x 120 mm
weight	15 kg

optional features

optional colours	all RAL-colours

remote control, remote monitoring and simulation

remote control	Fohhn-Net, Fohhn Audio Soft
remote monitoring	temperature, protect, signals, power supply, Fohhn-Net, Fohhn Audio Soft
Pilot signal monitoring	
fault contact	relay 2x alter
Simulation Beam	Fohhn-Net, Fohhn Audio Soft

electronic performance

amplifier output	16x 100 W
amplifier type	Pure Path Digital PWM
audio inputs	1x standard line input, with balanced transformers, isolated 1x additional redundant line input, with pilot tone monitoring, prioritized, with balanced transformers, isolated Optional Input Extensions OPTOCORE: MADI over CAT5 and optical fibre
audio outputs	2x link
DSP channels, Fohhn Audio DSP	16
amplification	25 dB
input sensitivity	1,4 V
frequency response	20 Hz - 20 kHz
S/N Ratio	>105 dB/A
protective circuit	soft start, temperature monitoring, short-circuit protection, overload
power supply	100 V - 240 V AC 4A 50/60 Hz, power supply with Power Factor Correction
current consumption	standby 5 W, max 800 W
low power	Green Power Standby Mode
temperature range	0 - 40°C
cooling	temperature-controlled fan
weight electronic	ca. 3 kg

-----> episode

controller	
digital signal processors	2
independent limiters	4
selective 3-band limiting	bass/ mid/ high
band specific time constants	
filter technology	56-bit double precision
AD	24 bit/ 96 kHz
FIR filters	
gain	-80 dB - +12 dB
volume	-80 dB - +12 dB
EQ	10-band parametric EQ, gain +/-12 dB, frequency range 10 - 20 kHz, Q 0,1 - 100
limiter compressor	
noise gate	
X-Over	Linkwitz-Riley 4. order, (24 dB/ octave), high pass: 10 Hz - 20 kHz, low pass: 10 Hz - 20 kHz
delay	0,01 - 350 ms (or 3,4 mm - 120 m)
connections (internal Phoenix terminal in the enclosure)	
Fohhn-Net	2x in/ thru Phoenix terminals
mains connections	2 pol Phoenix terminal, grounding screwed
audio inputs	2x in Phoenix terminals
audio outputs	2x link Phoenix terminals
fault contact	relay 2x alter, link Phoenix terminals
indicate LEDs (built-in)	
power on/ off (standby)	green = on, red = standby, red flashing = fault
network control	receive/ send remote control LED
CAAD simulation data	**EASE**
Make	**Fohhn Audio AG**
Type	**LFI-220**

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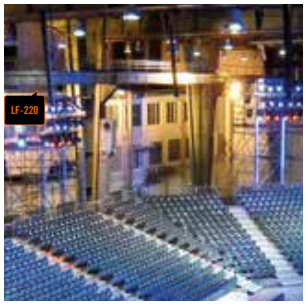

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