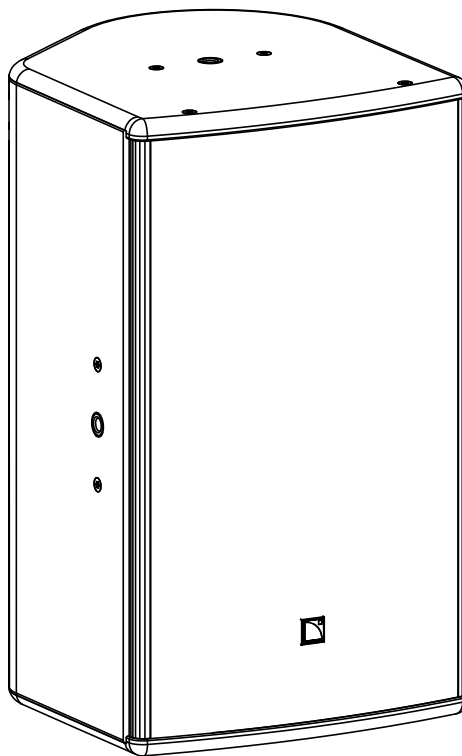


X8



user manual (EN)



Document reference: X8 user manual (EN) version 3.0

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Safety

Instructions



Inspect the product before operation.

If any sign of defect or damage is detected, immediately withdraw the product from use for maintenance.



Never incorporate equipment or accessories not approved by L-Acoustics.

Read all the related PRODUCT INFORMATION documents shipped with the products before exploiting the system.



Do not store the product on an unstable cart, stand, tripod, bracket, or table.



Beware of sound levels.

Do not stay within close proximity of loudspeakers in operation.

Loudspeaker systems are capable of producing very high sound pressure levels (SPL) which can instantaneously lead to permanent hearing damage to performers, production crew and audience members. Hearing damage can also occur at moderate level with prolonged exposure to sound.

Check the applicable laws and regulations relating to maximum sound levels and exposure times.



Read the RIGGING MANUAL before installing the system.

Use the rigging accessories described in the rigging manual and follow the associated procedures.

Read the maintenance section of this document before servicing the product.



Do not expose the product to extreme conditions.

Do not expose the product to rain or sea spray.

Do not expose the product to moisture (mist, steam, humidity, condensation...) or excessive heat (direct sun, radiator...) for a long period of time.



Contact L-Acoustics for advanced maintenance.

Any unauthorized maintenance operation will void the product warranty.

Symbols

The following symbols are used in this document:



This symbol indicates a potential risk of harm to an individual or damage to the product.

It can also notify the user about instructions that must be strictly followed to ensure safe installation or operation of the product.



This symbol notifies the user about instructions that must be strictly followed to ensure proper installation or operation of the product.



This symbol notifies the user about complementary information or optional instructions.

Welcome

Thank you for purchasing the L-Acoustics X8.

This document contains essential information on using the system properly.

As part of a continuous evolution of techniques and standards, L-Acoustics reserves the right to change the specifications of its products and the content of its document without prior notice. Please check www.l-acoustics.com on a regular basis to download the latest document and software updates.

X8 live monitoring enclosure

The X8 is a coaxial system designed for live monitoring and short throw sound reinforcement applications with minimum visual impact. The X8 features a 1.5" diaphragm compression driver coaxially loaded by an 8" low frequency transducer in a bass-reflex cabinet. The L-Vents laminar vented ports reduce turbulence and port noise at high levels to increase LF efficiency.

The X8 operates from 60 Hz to 20 kHz. The coaxial transducer arrangement and its partial horn produce a 100° axisymmetric directivity output with a smooth tonal response free of secondary lobes over the entire frequency range.

The internal passive crossover network uses custom filters. The L-Acoustics amplified controllers L-Drive parameters ensure the linearization and protection of the transducers.

With a cabinet combining the properties of birch and beech plywood, X8 weighs 12 kg and its elegance makes for an easy integration in any situation. It provides an angle setting of 35° with regard to vertical for stage monitoring. An optional white or RAL color program means that it can melt into any architecture.

The X8 is an ideal live monitor capable of accurately translating the signature of large systems at FOH position or in control rooms. The X8 features a pristine L-Acoustics sonic signature, a high SPL capability and extended LF resources in a compact format. Its coaxial design generates a wide conical directivity pattern with excellent spatialization and no minimum listening distance. Sound designers can also take advantage of its sleek design for discreet fill applications requiring a high SPL.

The X8 can be pole-mounted using the integrated socket. Other deployments such as wall-mounted, ceiling-mounted or flown are quick and easy, with a complete range of rigging accessories that offer multiple set-up options and various orientations.

System components

Loudspeaker enclosures

X8	2-way passive coaxial enclosure: 8" LF + 1.5" HF diaphragm
SB15m	High power compact subwoofer : 1 x 15"

Powering and driving system

LA4X / LA8 / LA12X	amplified controller with DSP, preset library and networking capabilities
LA-RAK	touring rack containing three LA8, for power, audio and network distribution
LA-RAK II	touring rack containing three LA12X, LA-POWER II for power distribution and LA-PANEL II for audio and network distribution
L-CASE	2U Electronics transport and protection case



Refer to the LA4X / LA8 / LA12X user manual for operating instructions.

Loudspeaker cables

SP cables	4-point speakON loudspeaker cables (4 mm ² gauge) SP cables come in four sizes: SP.7 (0.7 m/2.3 ft), SP5 (5 m/16.4 ft), SP10 (10 m/32.8 ft) and SP25 (25 m/82 ft)
SP-Y1	breakout cable for two passive enclosures (2.5 mm ² gauge) provided with a CC4FP adapter 4-point speakON to 2 × 2-point speakON
DO cables	8-point PA-COM loudspeaker cables (4 mm ² gauge) DO cables come in three sizes: DO.7 (0.7 m/2.3 ft), DO10 (10 m/32.8 ft) and DO25 (25 m/82 ft)
DOSUB-LA8	breakout cable for four passive enclosures (4 mm ² gauge) 8-point PA-COM to 4 × 2-point speakON



Information about the connection of the enclosures to the LA amplifiers is given in this document.

Refer to the LA4X / LA8 / LA12X user manual for detailed instructions about the whole cabling scheme, including modulation cables and network.

Rigging elements



Rigging elements or procedures are not presented in this document.
Refer to the X8 rigging manual.

Software applications

Soundvision	3D acoustical and mechanical modeling software
LA Network Manager	software for remote control and monitoring of amplified controllers



Refer to the **LA Network Manager video tutorial**.
Refer to the **Soundvision** help.

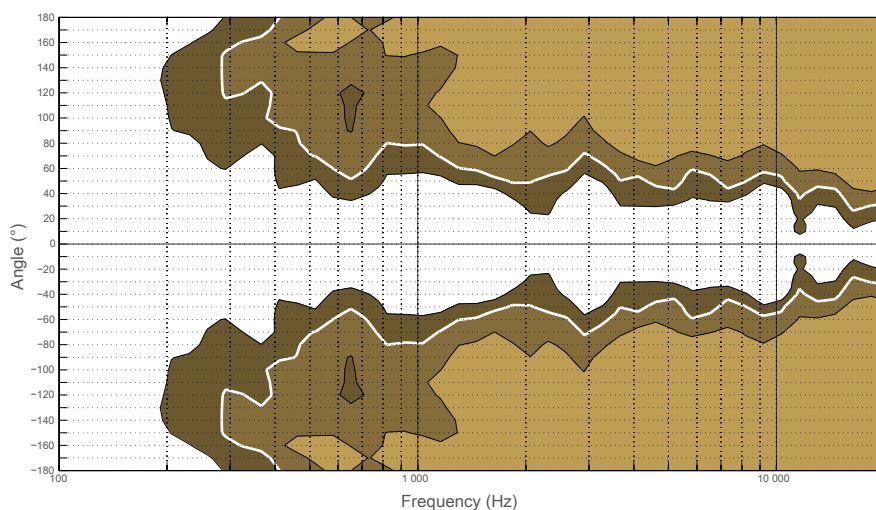
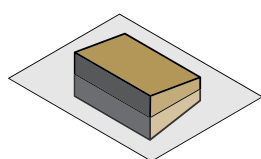
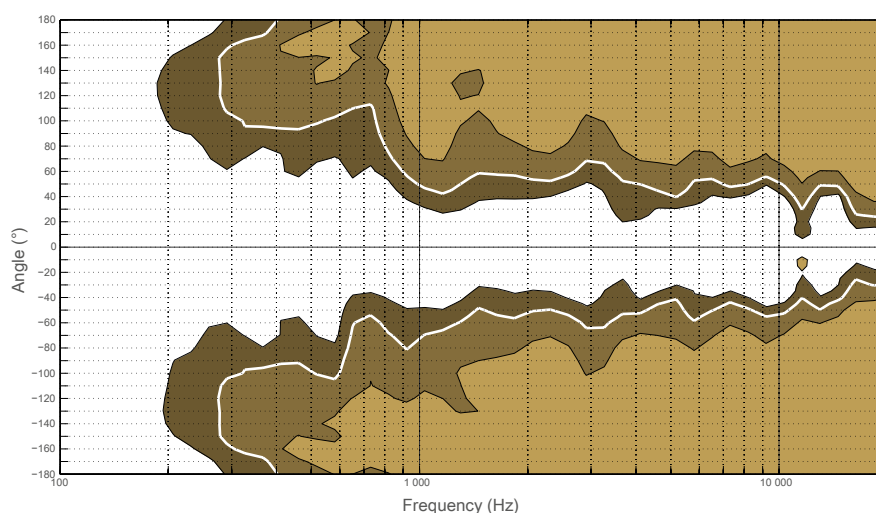
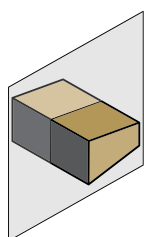
Technical description

Low-latency preset

A low-latency preset is available for the X8 enclosure used as a monitor ([X8_MO]). It reduces latency from 3.84 ms down to 1.19 ms (LA8) and 0.76 ms (LA4X / LA12X). If the monitor is combined with a subwoofer, a custom preset must be used.

Directivity

X8 features a coaxial transducer arrangement that generates an axisymmetric directivity pattern of 100°.



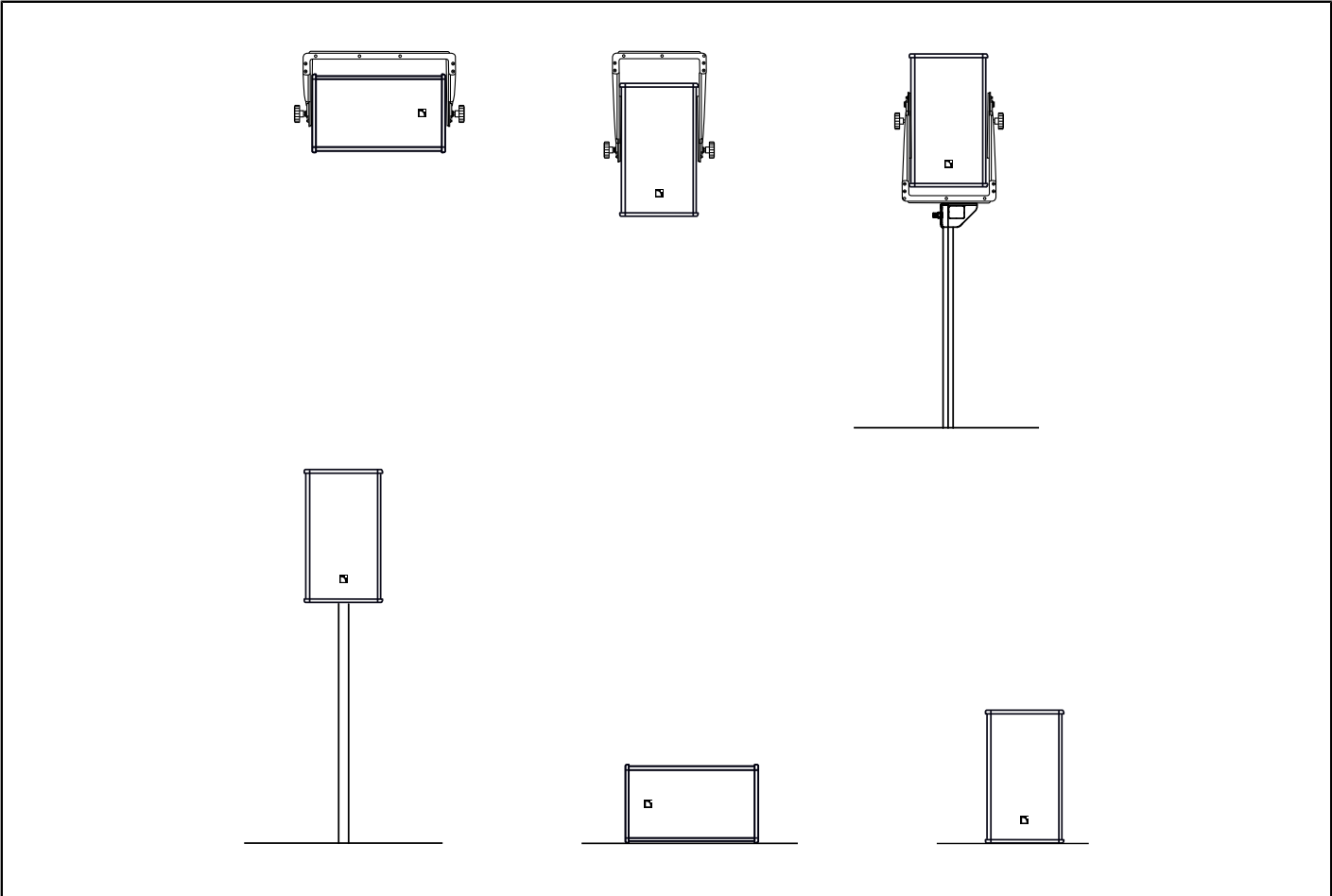
Dispersion angle diagram of a single X8 using lines of equal sound pressure at -3 dB, -6 dB, -12 dB.

Loudspeaker configurations

X8 point source

Deployed as a standalone point source, an X8 system operates over the nominal bandwidth of the X8 enclosure. The [X8] preset allows for a reference frequency response in short throw applications. The X8 enclosure is driven by the LA4X / LA8 / LA12X amplified controllers.

Standalone X8



Enclosure	X8
Preset	[X8]
Frequency range (-10 dB)	60 Hz - 20 kHz

X8 point source with LF

Deployed as a point source with SB15m subwoofers, an X8 system operates with augmented LF resources.

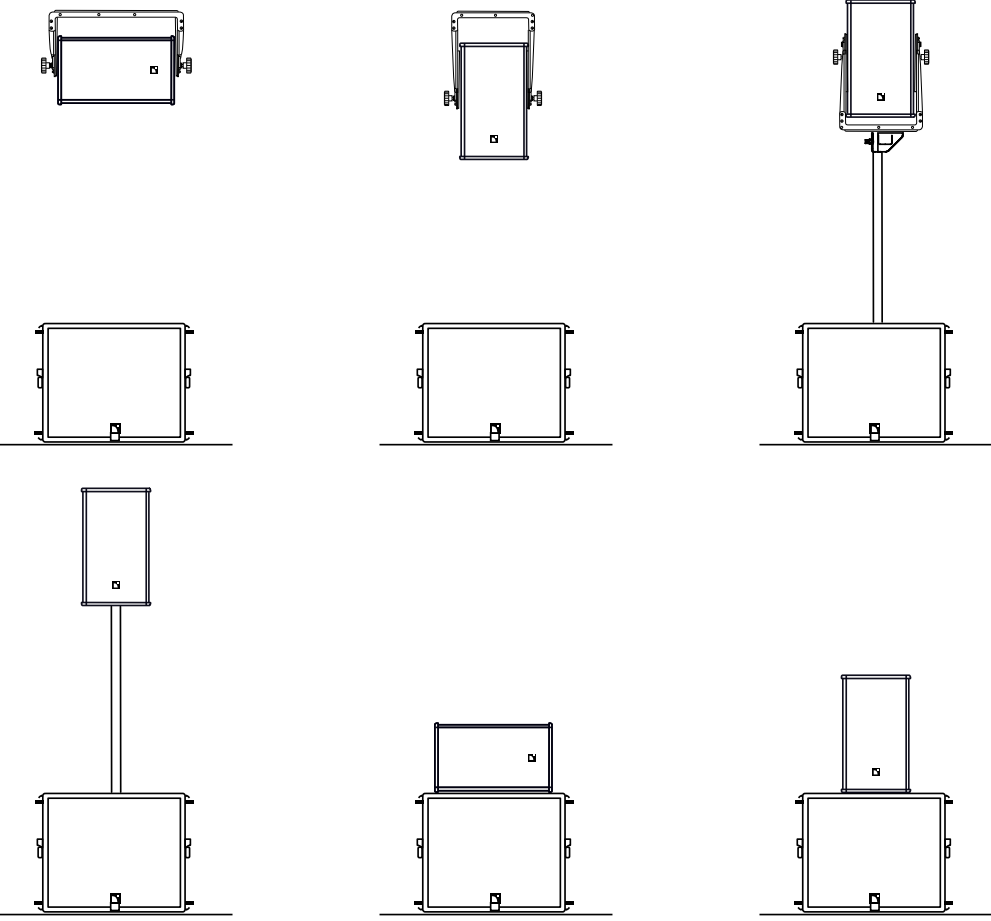
The [X8] preset allows for a reference frequency response in short throw applications.

The [SB15_100] preset provides the SB15m with an upper frequency limit at 100 Hz for an optimal frequency coupling with X8.

The X8 and SB15m enclosures are driven by the LA4X / LA8 / LA12X amplified controllers.

X8 with SB15m

With SB15m, the X8 system contour is reinforced by 8 dB at 100 Hz and the bandwidth is extended down to 40 Hz.

		
Enclosure	X8	SB15m
Preset	[X8]	[SB15_100]
Frequency range (-10 dB)	40 Hz - 20 kHz	
Enclosure ratio	1 X8 : 1 SB15m	



Delay values

Do not forget to add the pre-alignment and geometric delays depending on the configuration.

Pre-alignment delays

[X8] + [SB15_100]	X8 = 0 ms	SB15m = 2.6 ms
-------------------	-----------	----------------


X8 stage monitor

Deployed as a stage monitor, an X8 system operates over the nominal bandwidth of the X8 enclosure.

The [X8_MO] preset allows for a reference frequency response in stage monitoring applications.

The X8 enclosure is driven by the LA4X / LA8 / LA12X.

Standalone X8

<div style="text-align: center;"> 35°  </div>	
Enclosure	X8
Preset	[X8_MO]
Frequency range (-10 dB)	55 Hz - 20 kHz

Paired X8 monitors with LFC

The Low Frequency Contour (LFC) tool implemented in LA Network Manager can compensate for coupling effects between closely operating monitors. LFC allows to adjust the frequency response curve to obtain the desired low frequency contour.

For paired X8 monitors, enter the following parameters to obtain the reference response curve of a single enclosure:

	LF Contour	N/A
FREQ/RATIO	180	
GAIN	-3.0	

For more information about LFC, refer to the **LA Network Manager** video tutorial (module: Group Control Panel) and to the **Array Morphing** white paper, available on www.l-acoustics.com (Download Center).

X8 stage monitor with LF

Deployed as a stage monitor with SB15m subwoofers, an X8 system operates with augmented LF resources.

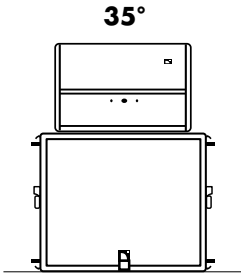
The [X8_MO] preset allows for a reference frequency response in stage monitoring applications.

The [SB15_100] preset provides the SB15m with an upper frequency limit at 100 Hz for an optimal frequency coupling with the X8.

The X8 and the SB15m enclosures are driven by the LA4X / LA8 / LA12X amplified controllers.

X8 stage monitor with SB15m

With SB15m, the X8 system contour is reinforced by 8 dB at 100 Hz and the system bandwidth is extended down to 40 Hz.

		
Enclosure	X8	SB15m
Preset	[X8_MO]	[SB15_100]
Frequency range (-10 dB)	40 Hz - 20 kHz	
Enclosure ratio	1 X8 : 1 SB15m	



Delay values

Do not forget to add the pre-alignment and geometric delays depending on the configuration.

Pre-alignment delays

[X8_MO] + [SB15_100]	X8 = 0 ms	SB15m = 2.6 ms
----------------------	-----------	----------------



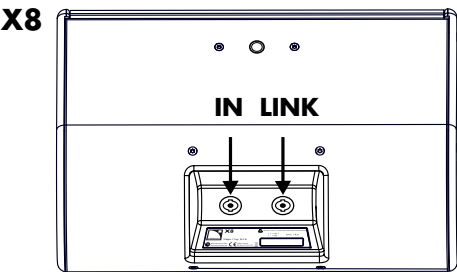
[xx_MO] presets for the X series use the amplified controller low latency operating mode. When used along with subwoofers, it is recommended to use the subwoofers in low latency operating mode. To achieve this, create custom presets combining low latency channel sets and subwoofer channel sets.

If the subwoofers are driven from a dedicated amplified controller using a subwoofer factory preset, they are operated in normal latency mode. Therefore, an additional delay should be set to the [xx_MO] low latency channels to align them: 2.65 ms on LA8 or 3.08 ms on LA4X and LA12X.

Loudspeaker connection

Connectors

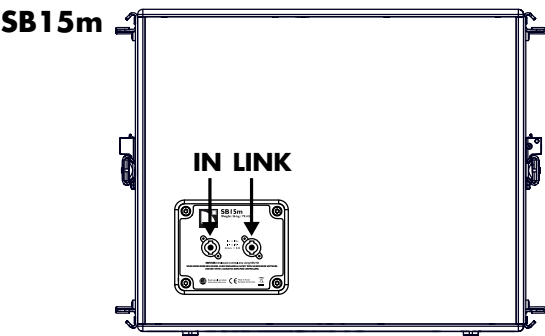
The X8 is equipped with two 4-point speakON connectors.



Internal pinout for L-Acoustics 2-way passive enclosures

speakON points	1 +	1 -	2 +	2 -
Transducer connectors	+	-	Not linked	Not linked

The SB15m is equipped with two 4-point speakON connectors.



Internal pinout for L-Acoustics subwoofers

speakON points	1 +	1 -	2 +	2 -
Transducer connectors	LF +	LF -	Not linked	Not linked

Connection to LA4X

Maximum number of enclosures per LA4X

enclosure	max enclosures in parallel	max enclosures per controller
X8	2	8
SB15m	1	4

Impedance load

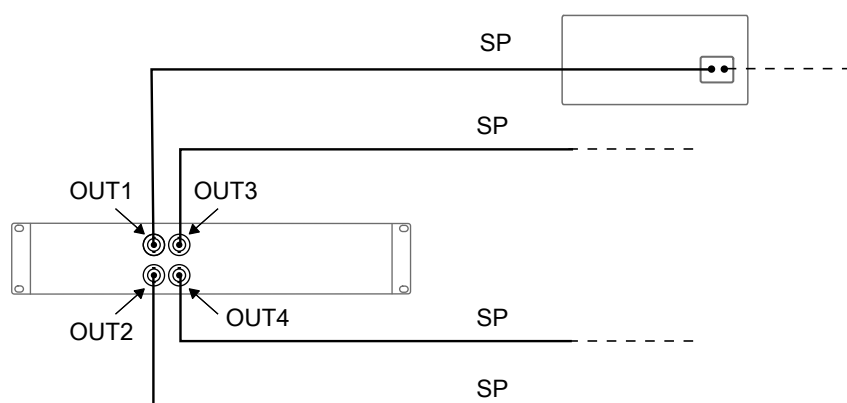
X8 SB15m

1 enclosure: 8 Ω

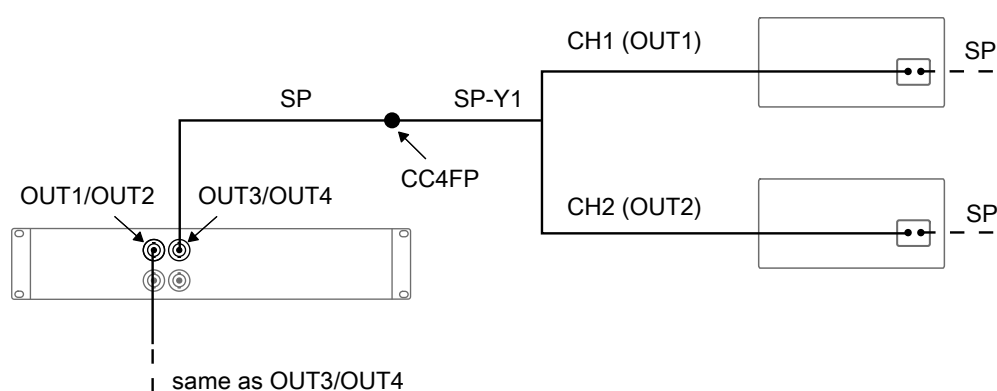
2 enclosures in parallel: 4 Ω

Connecting 2-way passive enclosures

2-way passive enclosure on speakON output - SP



2-way passive enclosure on speakON output - SP + SP-Y1



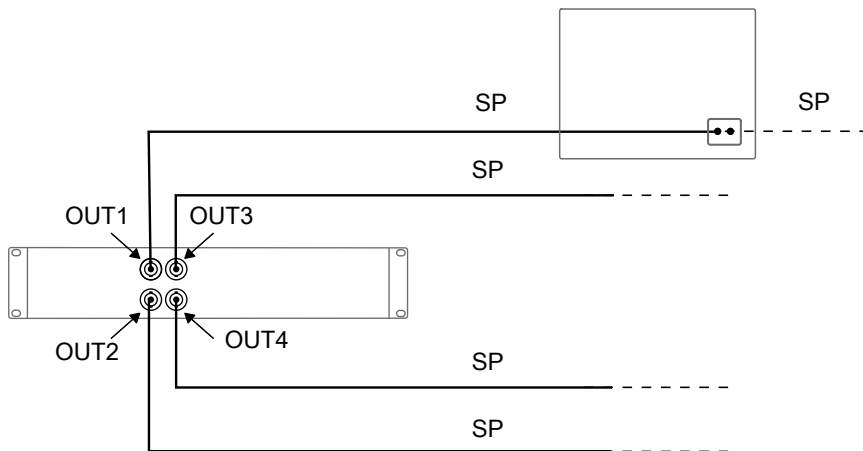
Connecting subwoofers



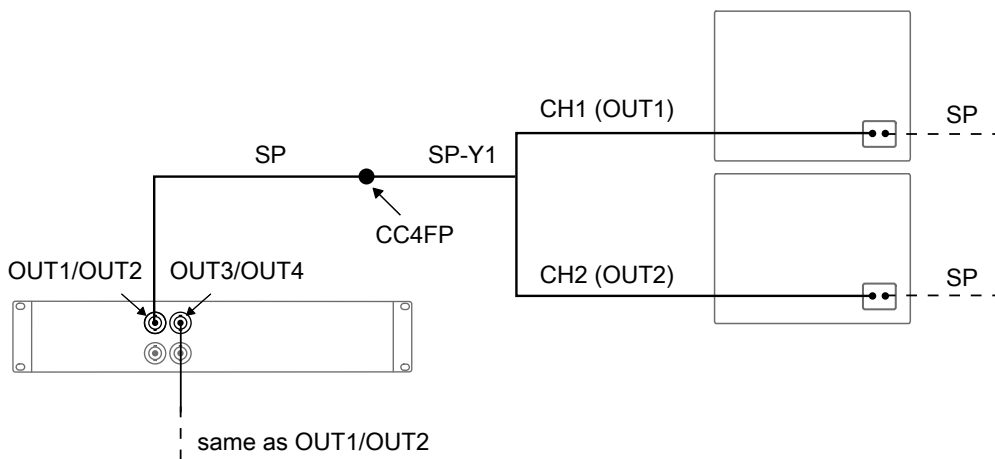
Cardioid configuration

Connect the reversed subwoofer(s) to OUT 1 to use the cardioid preset.

Subwoofer on speakON output - SP



Subwoofer on speakON output - SP + SP-Y1



Connection to LA8

Maximum number of enclosures per LA8

enclosure	max enclosures in parallel	max enclosures per controller
X8	3	8
SB15m	2	6



Make sure the total number of connected enclosures does not exceed the maximum number of enclosures per controller.

LA8 can drive up to three X8 per output, but no more than eight per controller.

LA8 can drive up to two SB15m per output, but no more than six per controller.

Impedance load

X8 SB15m

1 enclosure: 8 Ω

2 enclosures in parallel: 4 Ω

3 enclosures in parallel: 2.7 Ω

Connection to LA12X

Maximum number of enclosures per LA12X

enclosure	max enclosures in parallel	max enclosures per controller
X8	3	12
SB15m	3	12

Impedance load

X8 SB15m

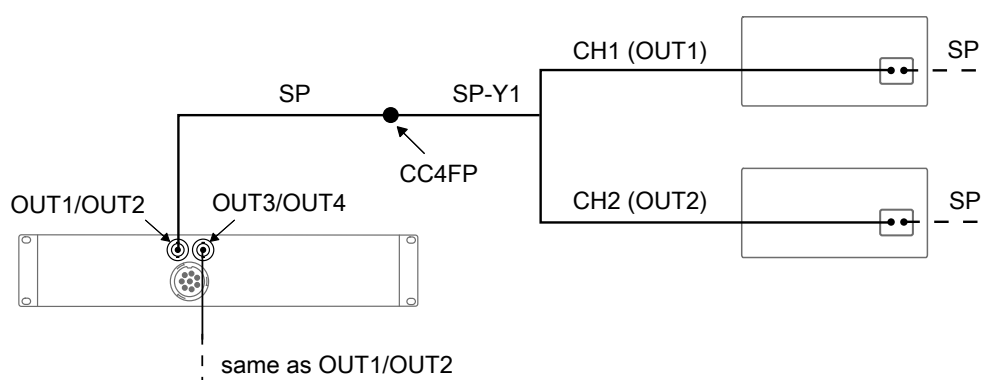
1 enclosure: 8 Ω

2 enclosures in parallel: 4 Ω

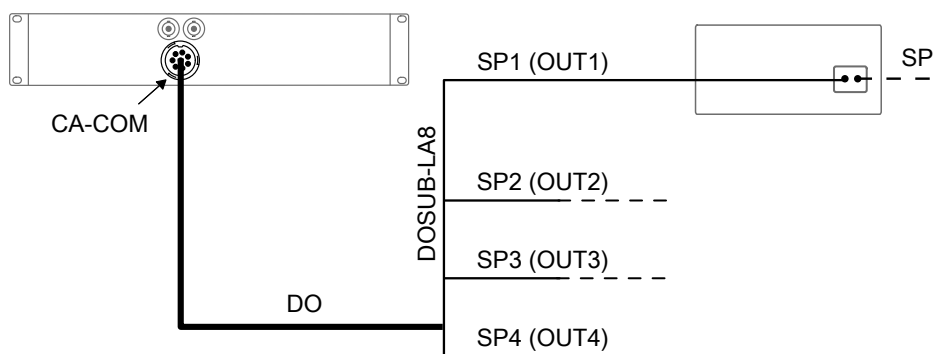
3 enclosures in parallel: 2.7 Ω

Connecting 2-way passive enclosures

2-way passive enclosure on speakON output - SP + SP-Y1



2-way passive enclosure on CA-COM output - DO + DOSUB-LA8



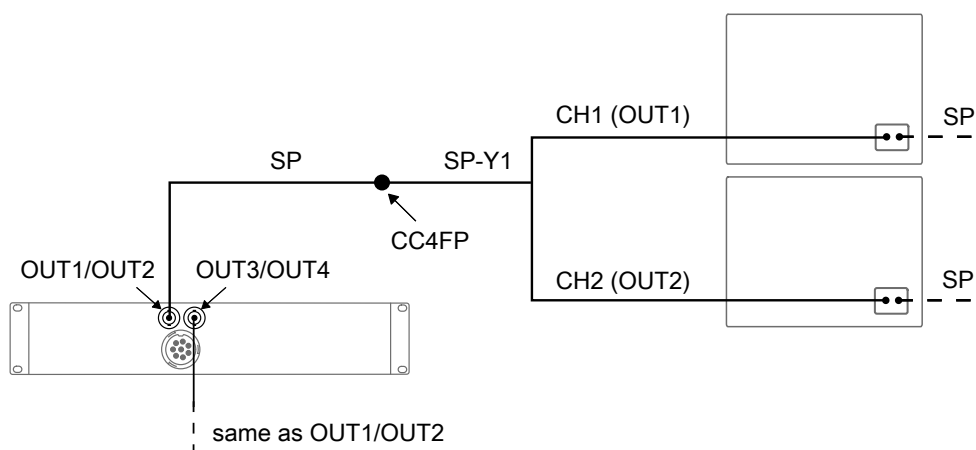
Connecting subwoofers



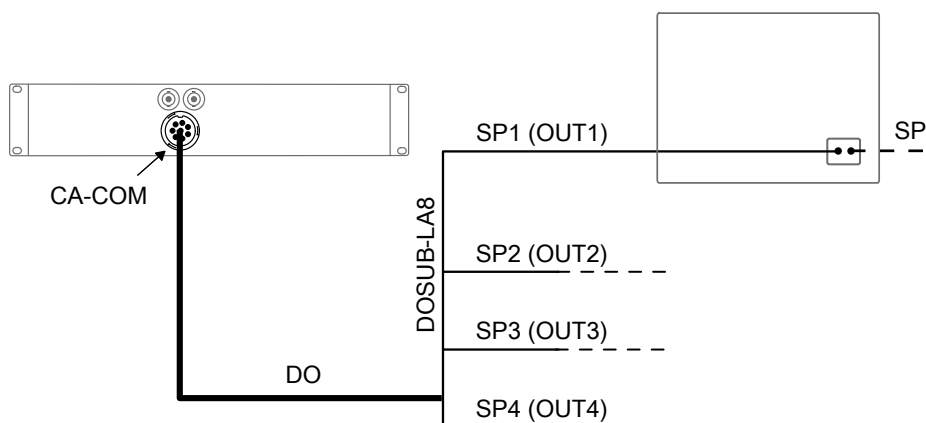
Cardioid configuration

Connect the reversed subwoofer(s) to OUT 1 to use the cardioid preset.

Subwoofer on speakON output - SP + SP-Y1



Subwoofer on CA-COM output - DO + DOSUB-LA8



Preset description

[SB15_100]

outputs	channels	routing	gain	delay	polarity	mute
OUT 1	SB	IN A	0 dB	0 ms	+	ON
OUT 2	SB	IN A	0 dB	0 ms	+	ON
OUT 3	SB	IN A	0 dB	0 ms	+	ON
OUT 4	SB	IN A	0 dB	0 ms	+	ON

[SB15_100_C]

loudspeaker elements	outputs	channels	routing	gain	delay	polarity	mute
SR	OUT 1	SR	IN A	0 dB	0 ms	+	ON
SB	OUT 2	SB					ON
SB	OUT 3	SB					ON
SB	OUT 4	SB					ON

[X8] [X8_MO]

outputs	channels	routing	gain	delay	polarity	mute
OUT 1	PA	IN A	0 dB	0 ms	+	ON
OUT 2	PA	IN A	0 dB	0 ms	+	ON
OUT 3	PA	IN B	0 dB	0 ms	+	ON
OUT 4	PA	IN B	0 dB	0 ms	+	ON

Recommendation for speaker cables

Follow the recommended maximum length for loudspeaker cables to ensure minimal SPL attenuation.



Cable quality and resistance

Only use high-quality fully insulated speaker cables made of stranded copper wire.

Use cables with a gauge offering low resistance per unit length and keep the cables as short as possible.

The table below provides the recommended maximum length for loudspeaker cables depending on the cable gauge and on the impedance load connected to the amplifier.

cable gauge			recommended maximum length					
			8 Ω load		4 Ω load		2.7 Ω load	
mm ²	SWG	AWG	m	ft	m	ft	m	ft
2.5	15	13	30	100	15	50	10	33
4	13	11	50	160	25	80	17	53
6	11	9	74	240	37	120	25	80

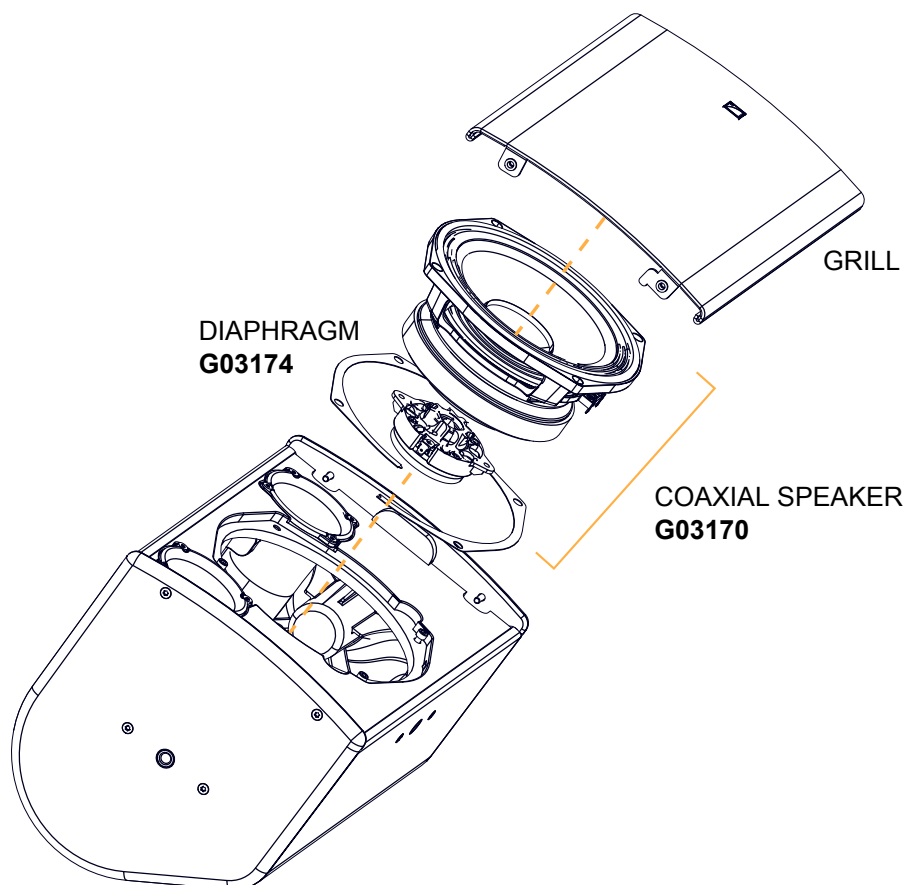
For your installation projects, you can use the more detailed L-ACOUSTICS calculation tool to evaluate cable length and gauge based on the type and number of enclosures connected. The calculation tool is available on our website:

<http://www.l-acoustics.com/installation-outils-de-calcul-137.html>

Maintenance

Disassembly and Reassembly procedures

In order to operate, follow the order outlined here. Each assembly refers to the corresponding D/R procedure and the necessary repair kit.



D/R - Grill

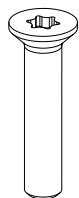
Tools

- torque screwdriver
- T25 Torx bit

Repair kit

G03170 - KR coaxial speaker X8 or

G03174 - KR diaphragm X8



x4

S100033

M5x25 Torx

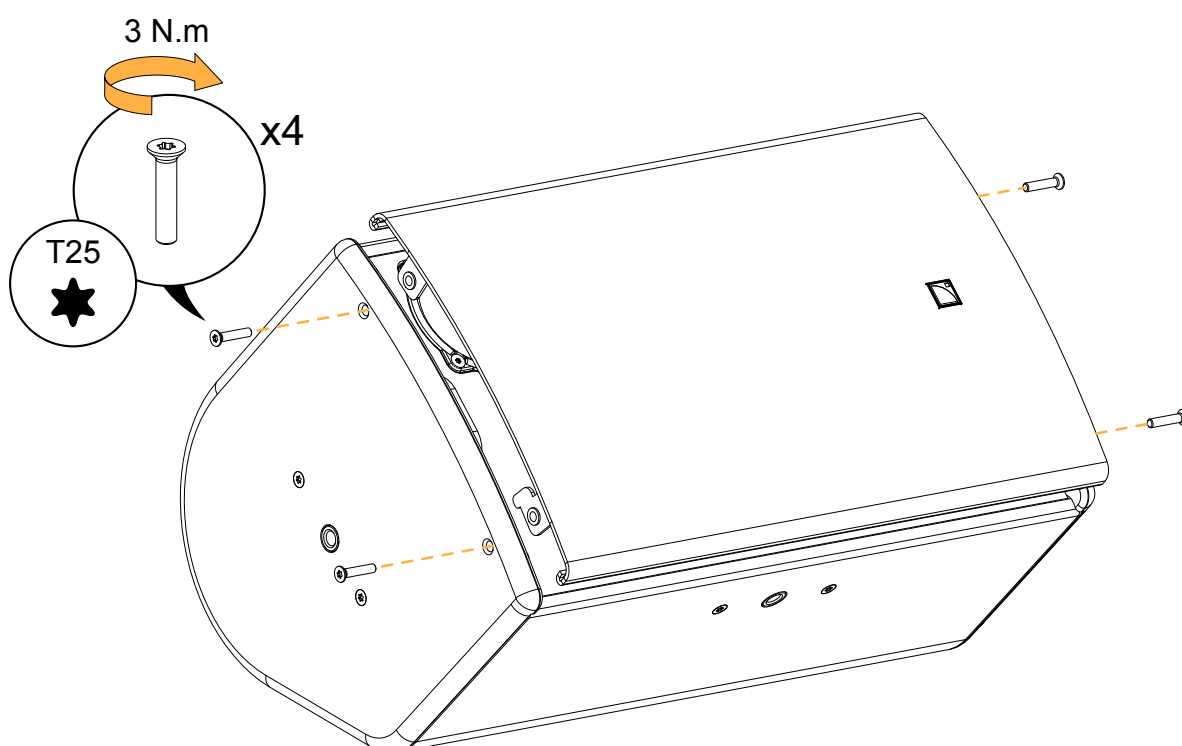


For safety reasons, always use the new screws and spare parts provided in the KR.

Exploded view



Tighten the screws following a star pattern.



D/R - Coaxial loudspeaker

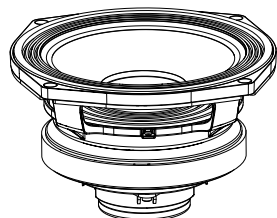
Tools

- torque screwdriver
- 4 mm hex bit

Repair kit

G03170 *

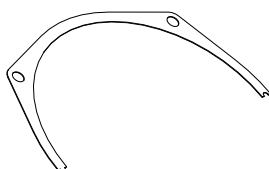
KR coaxial speaker X8



x1

03046

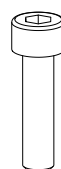
8" coaxial speaker - 8 ohms



x2

100604

8" speaker gasket



x4

S342

M5x20 hex

* The screws and gaskets are also available in G03174 - KR diaphragm X8 .

Pre-requisite

Grill disassembled.

See [Grill](#) (p.20).

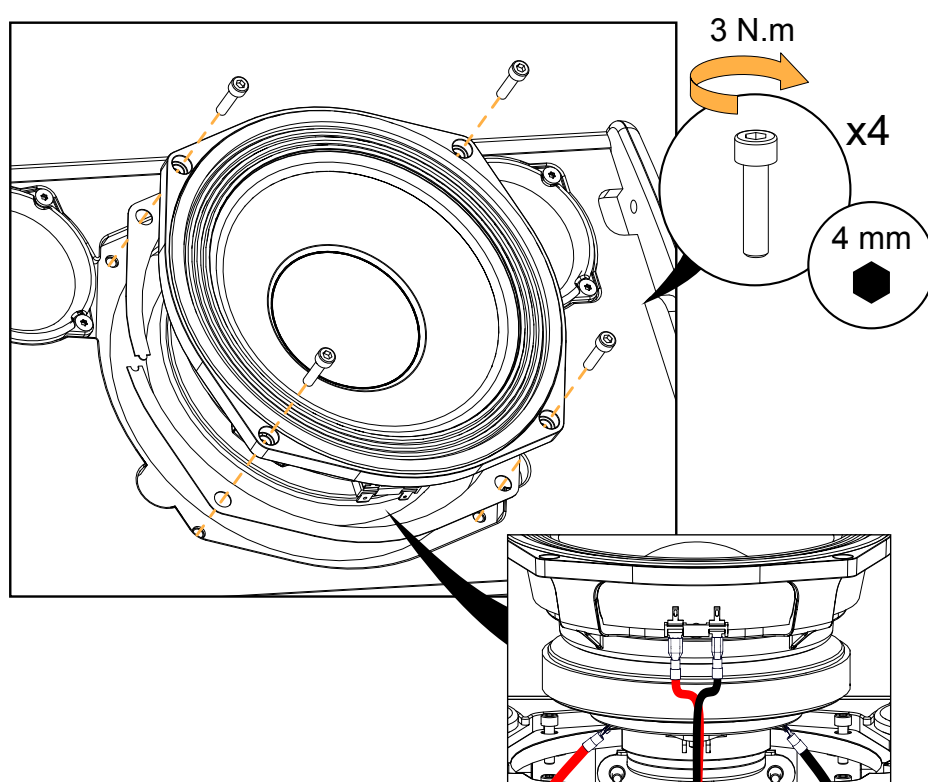


For safety reasons, always use the new screws and spare parts provided in the KR.

Exploded view



Tighten the screws following a star pattern.



D/R - Diaphragm

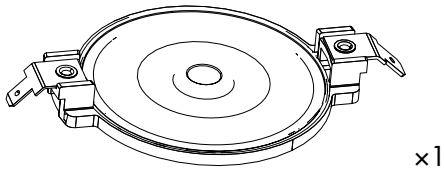
Tools

- torque screwdriver
- 3 mm hex bit
- 3 mm Allen wrench

Repair kit

G03174

KR diaphragm X8



17704

X8 diaphragm assembly



S182

M4x12 hex

Pre-requisite

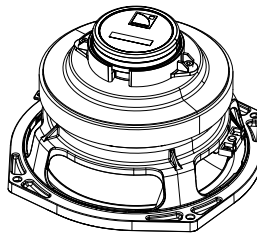
Grill disassembled.

Coaxial speaker removed.

The speaker is placed on a flat surface in a dust-free environment.

See [Grill](#) (p.20).

See [Coaxial loudspeaker](#) (p.21).



Disassembly

- 1.** Remove the two screws securing the HF driver.
Use the 3 mm hex bit.
- 2.** Remove the HF driver and remove the gasket between the HF and LF driver.
- 3.** Place the HF driver on a flat surface.
- 4.** Remove the four screws securing the cover and remove the cover.
Use the 3 mm hex bit.
- 5.** Pierce the label and carefully remove the center screw while holding the cone in place.
Use the 3 mm hex bit.



Discard the paper disk to avoid parasitic vibrations.

- 6.** Remove the cone.
- 7.** Carefully remove the diaphragm holding it by the connectors.
- 8.** If there are black spacers on the air gap, do not remove them.

Reassembly

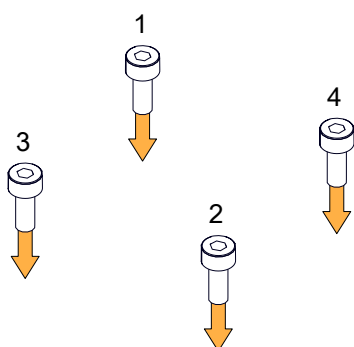
1. Clean the driver and the air gap.

Use a blower or double face adhesive tape to clean any particle.



Make sure the air gap is perfectly clean before moving to the next step.

2. Carefully place the diaphragm.
If there are black spacers, make sure they remain in place.
3. Position the diaphragm using the screw holes as reference points.
The connectors must be positioned halfway between two screw holes.
4. Place the cone in the middle.
5. While holding the cone in place, drive the center screw manually using the 3 mm Allen wrench.
6. Secure the cover with four S182 screws.
 - a) Gradually secure each screw manually with the 3 mm Allen wrench.
Follow a star pattern.



- b) Tighten the screws in the same order with the torque screwdriver.
Use the 3 mm hex bit. Set the torque to 1.7 Nm.
7. While holding the cone in place, tighten the center screw with the torque screwdriver.
Use the 3 mm hex bit. Set the torque to 1.7 Nm.
 8. Place the gasket on the LF driver.
 9. Carefully position the HF driver on the LF driver.
Use the connectors as reference points. When facing the LF driver connectors, the small HF driver connector must be on the left, and the larger one on the right.
 10. Secure the HF driver on the LF driver with the two screws.
Use the 3 mm hex bit. Set the torque to 3 Nm.

Acoustical check

Procedure

1. Load a FLAT preset on an LA4X / LA8 / LA12X amplified controller.
2. Connect a low frequency generator to the active input of the amplified controller.
3. Connect a voltmeter to the output of the amplified controller and check the output voltage.



Risk of damaging the HF driver

The output voltage must not exceed 1 Vrms.

4. Connect the HF driver to the output of the amplified controller.



Use ear protection to set the sound level before testing.

5. Send a test signal of 1.5 kHz at 1 Vrms for 5 seconds.
The sound should remain pure and free of unwanted noise.

Troubleshooting

The loudspeaker produces high-frequency harmonic distortions or strange vibrations.

Possible causes

- There are foreign particles on the air gap.
- The number of shims is wrong.
- The screws used for reassembly are too loose.

Procedure

1. Repeat the disassembly procedure.
2. Clean the air gap thoroughly.
3. Repeat the reassembly procedure.
Pay close attention to the number of shims and the position of the diaphragm.
Apply the recommended torque.
4. Repeat the acoustical check.



If a buzzing sound is still audible, it might be necessary to add an extra shim on the air gap.

Illustrations

Loudspeaker cables



SP.7

4-point speakON loudspeaker cable (0.7 m / 2.3 ft)



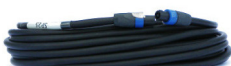
SP5

4-point speakON loudspeaker cable (5 m / 16.4 ft)



SP10

4-point speakON loudspeaker cable (10 m / 32.8 ft)



SP25

4-point speakON loudspeaker cable (25 m / 82 ft)



DO.7

8-point PA-COM loudspeaker cable (0.7 m / 2.3 ft)



DO10

8-point PA-COM loudspeaker cable (10 m / 32.8 ft)



DO25

8-point PA-COM loudspeaker cable (25 m / 82 ft)



DOSUB-LA8

breakout cable for four passive enclosures



SP-Y1

breakout cable for two passive enclosures

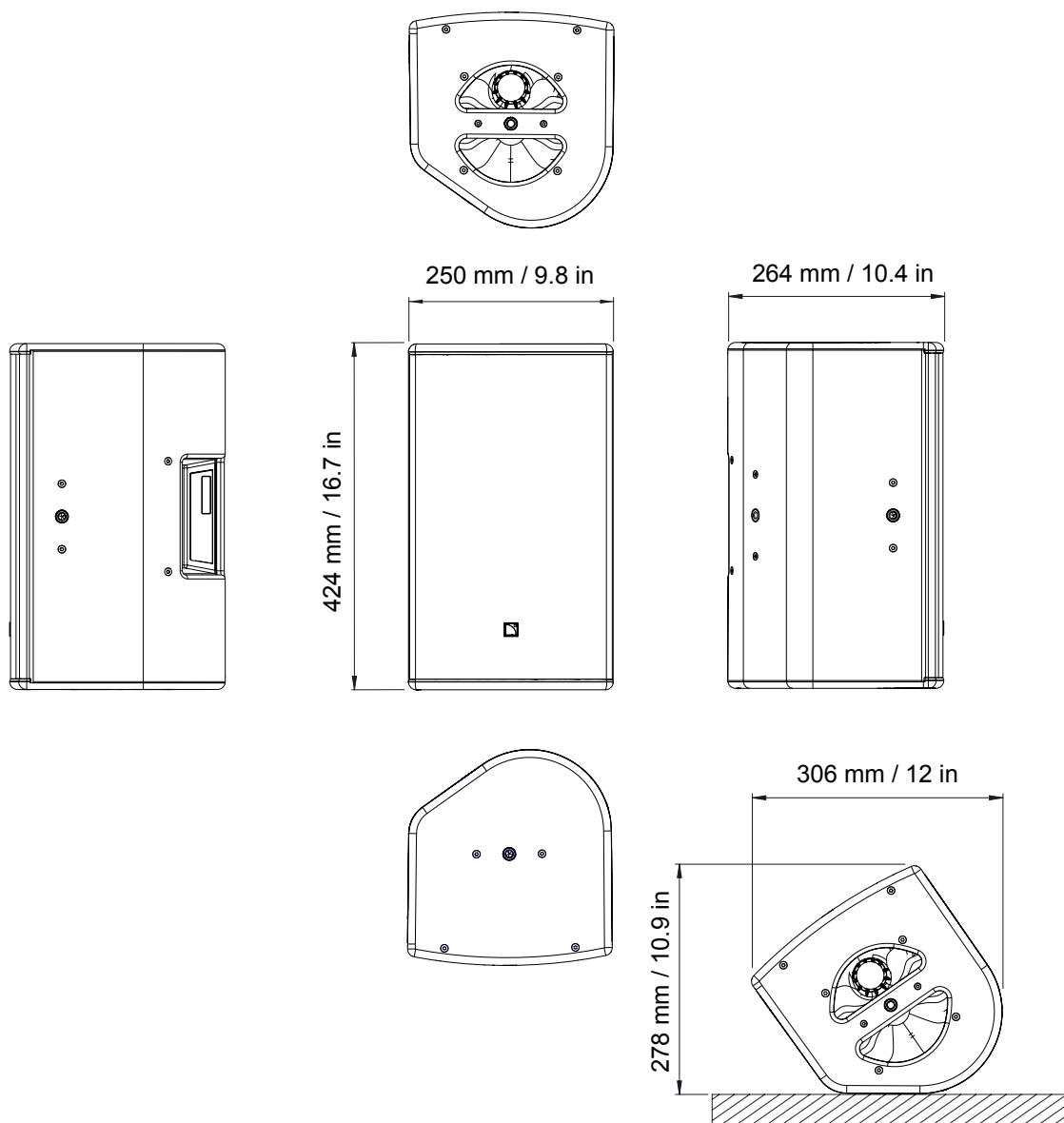
Specifications

X8 specifications

Description	passive 2-way coaxial enclosure, amplified by LA4X / LA8 / LA12X
Usable bandwidth (-10 dB)	60 Hz - 20 kHz ([X8])
Maximum SPL ¹	127 dB ([X8])
Nominal directivity	axisymmetric 100°
Monitoring angle	35°
Transducers	LF: 1 × 8" HF: 1 × 1.5" compression driver, neodymium
Acoustical load	bass-reflex, L-Vents,
Nominal impedance	8 Ω
Connectors	IN: 4-point speakON LINK: 4-point speakON
Rigging and handling	1 handle DIN580-compatible M8 threaded insert 4 M10 threaded inserts 1 × 35 mm pole socket
Weight (net)	12 kg / 26.5 lb
Cabinet	first grade Baltic beech and birch plywood
Front	steel grill with anti-corrosion coating acoustically neutral 3D fabric
Finish	dark grey brown Pantone 426C pure white RAL 9010 custom RAL code on special order IP43

¹ Peak level at 1 m under free field conditions using 10 dB crest factor pink noise with specified preset.

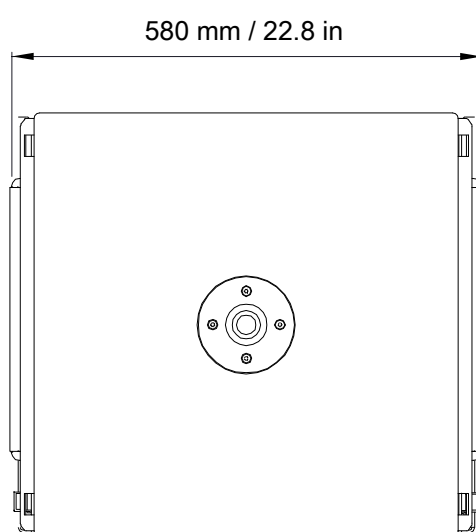
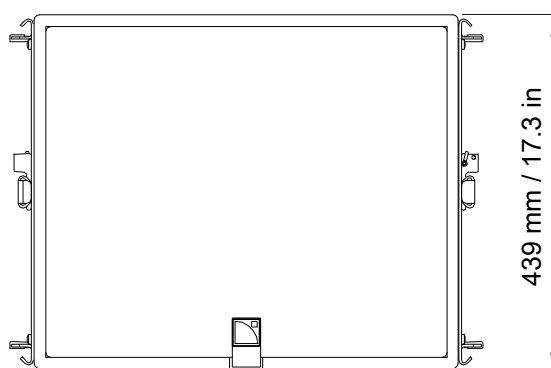
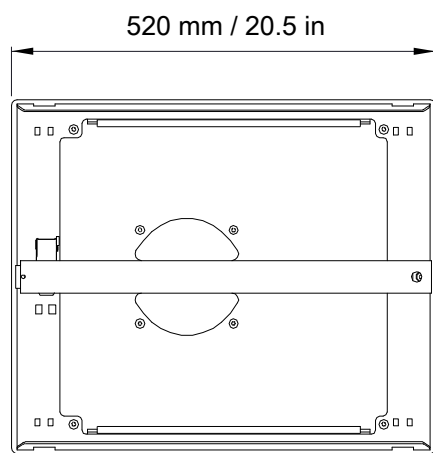
X8 dimensions



SB15m specifications

Description	high power compact subwoofer, amplified by LA4X / LA8 / LA12X
Low frequency limit	40 Hz ([SB15_100])
Maximum SPL¹	135 dB ([SB15_100])
Directivity	standard or cardioid
Transducers	1 x 15"
Acoustical load	bass-reflex enclosure, L-Vents
Nominal impedance	8 Ω
Connectors	IN: 4-point speakON LINK: 4-point speakON
Rigging and handling	2 handles 2 coupling bars and 2 locking tabs 1 x 35 mm pole socket
Weight (net)	36 kg / 79.4 lb
Cabinet	first grade Baltic birch plywood
Front	steel grill with anti-corrosion coating acoustically neutral 3D fabric
Rigging components	high grade steel
Finish	dark grey brown Pantone 426C pure white RAL 9010 custom RAL code on special order

¹ Peak level measured at 1 m under half space conditions using 10 dB crest factor pink noise with specified preset.

SB15m dimensions



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