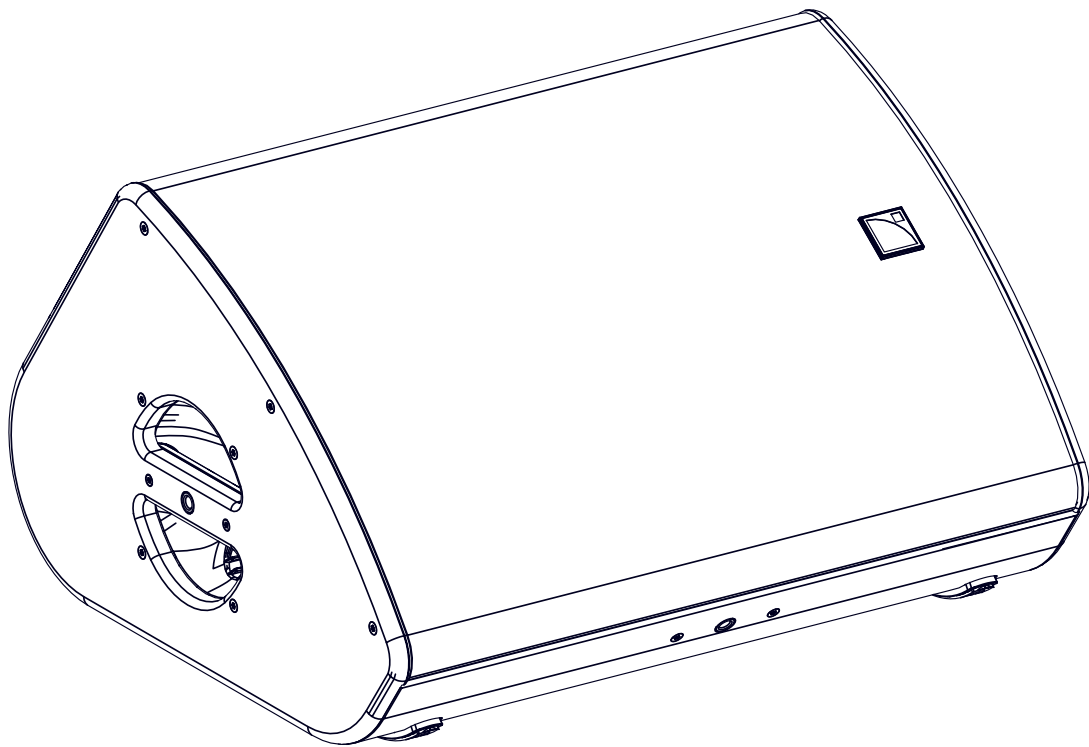


X 15 HIQ



user manual (EN)



Document reference: X15 HiQ user manual (EN) version 5.0

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Safety

Instructions

- 
Inspect the system before any deployment.
 Perform safety related checks and inspections before any deployment.
- Perform preventive maintenance at least once a year.**
 Refer to the preventive maintenance section for a list of actions and their periodicity.
 Insufficient upkeep of the product can void the warranty.
- If any safety issue is detected during inspection, do not use the product before performing corrective 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.
- 
Intended use
 This system is intended for use by trained personnel for professional applications.
- 
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 X15 HiQ.

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.

X15 HiQ reference stage monitor

The X15 HiQ is an active coaxial system designed as a reference stage monitor. The enclosure features a 3" diaphragm compression driver coaxially-loaded by a 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 X15 HiQ operates from 20 Hz to 20 kHz . The coaxial transducer arrangement and its ellipsoid waveguide produce a 10 dB directivity pattern with a smooth tonal response free of secondary lobes over the entire frequency range. As a result, X15 HiQ boasts an exceptional immunity to feedback.

The L-Acoustics amplified controllers ensure the advanced crossover functions, time alignment, linearization and L-Drive protection of the transducers.

With a cabinet combining the properties of birch and beech plywood, X15 HiQ weighs a mere 15 kg and features ergonomic handles for a solid grip and efficient handling. Its elegance and ultra-low profile make for an easy integration into the set. It provides a stage monitoring angle setting of 15° with regard to vertical or 45° thanks to its built-in risers. For special narrow fill applications, the X15 HiQ can be pole-mounted using the integrated socket or flown and tilted in various orientations using its rigging accessories.

The X15 HiQ combines all the qualities of a reference stage monitor. It offers 120 dB power (SPL) in beamwidth, an excellent acoustic isolation with its narrow ellipsoid directivity of 10 dB , a high immunity to feedback, an ultra-low profile and low weight for integration and handling, a rugged build and an active design with low latency preset. In addition, sound designers can take advantage of its directivity for narrow fill applications.

The X15 HiQ 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

X15 HiQ	2-way active coaxial enclosure: 15" LF + 3" HF diaphragm
SB18	High power compact subwoofer: 1 x 18"



SB18 / SB18i / SB18m

In this document, the SB18 term and illustrations refer equally to SB18, SB18i or SB18m.

Powering and driving system

LA4X / LA8 / LA12X	Amplified controller with DSP, preset library and networking capabilities
LA-RAK	Touring rack containing three LA8 and 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



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 x 2-point speakON
DO	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 x 2-point speakON
DOFILL-LA8	breakout cable for two 2-way active enclosures (4 mm ² gauge) 8-point PA-COM to 2 x 4-point speakON
DO3WFILL	breakout cable for one 2-way active enclosure and two passive enclosures (4 mm ² gauge) 8-point PA-COM to 1 x 4-point speakON and 2 x 2-point speakON



Information about the connection of the enclosures to the LA amplified controllers 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 X15 HiQ rigging manual.

Software applications

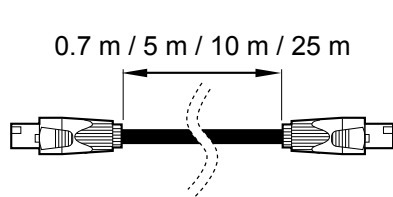
Soundvision 3D acoustical and mechanical modeling software

LA Network Manager Software for remote control and monitoring of amplified controllers

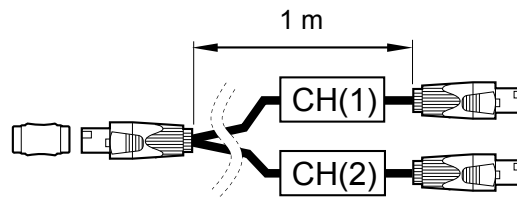
i Refer to the **Soundvision** help.

i Refer to the **LA Network Manager** help.

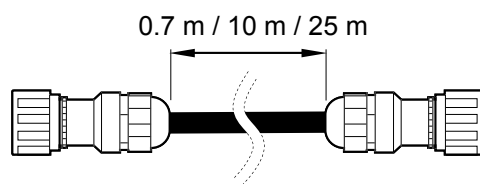
Loudspeaker cables



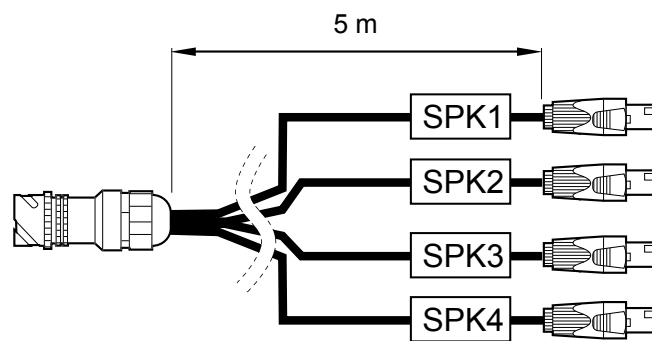
SP.7 / SP5 / SP10 / SP25



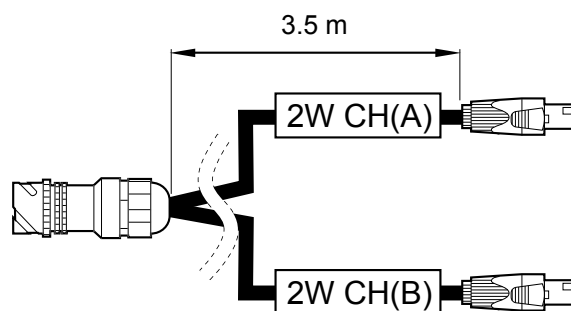
SP-Y1



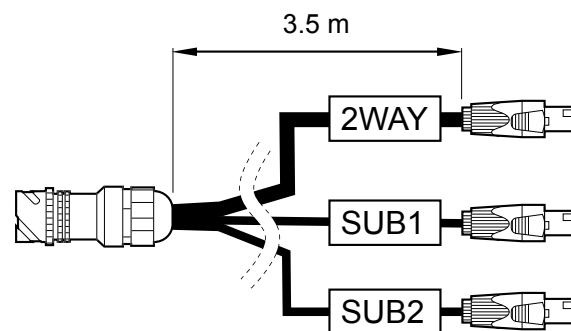
DO.7 / DO10 / DO25



DOSUB-LA8



DOFILL-LA8



DO3WFILL

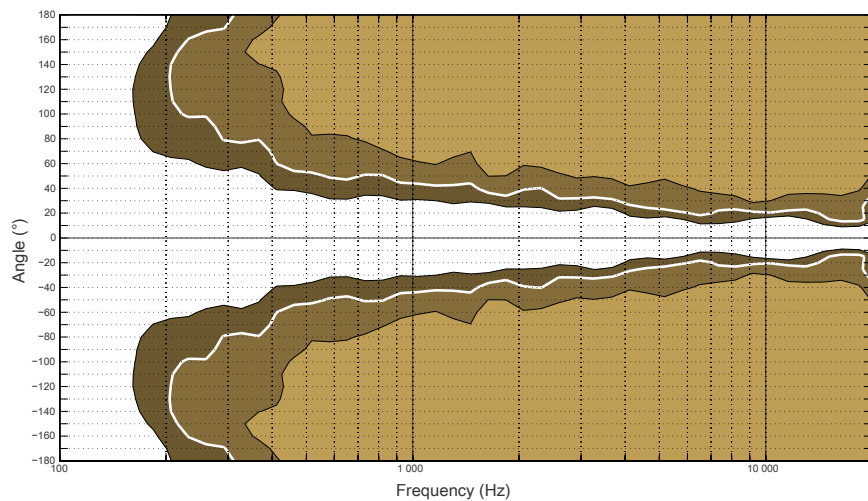
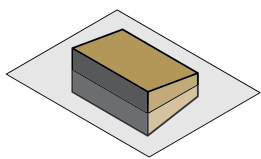
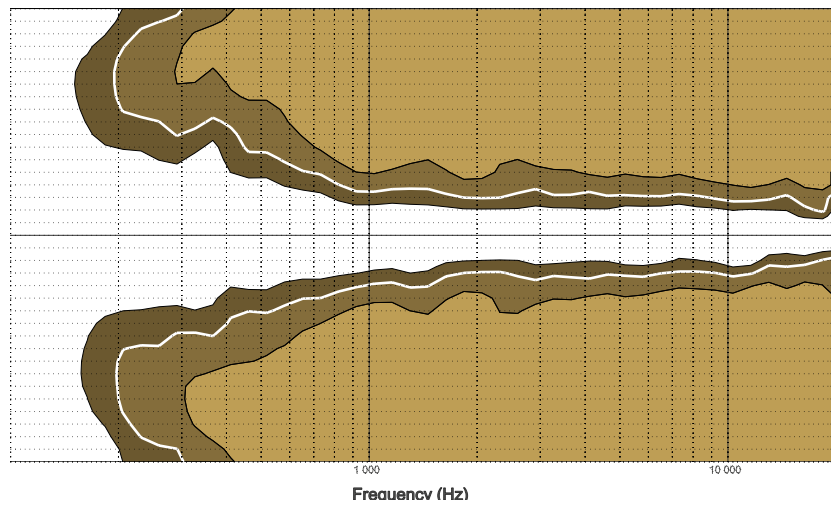
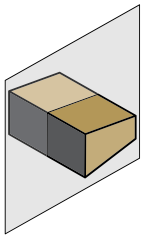
Technical description

Low-latency preset

A low-latency preset is available for the X15 HiQ enclosure used as a monitor ([X15_MO]). It reduces latency from 3.84 ms down to 1.18 ms (LA8) and 0.84 ms (LA4X / LA12X). If the monitor is combined with a subwoofer, a custom preset must be used.

Directivity

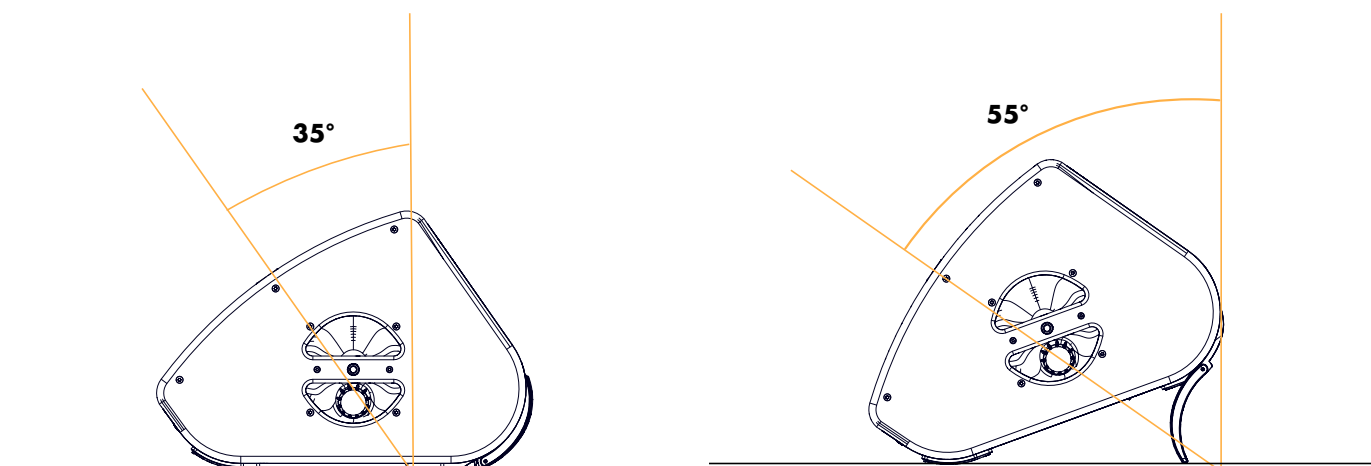
X15 HiQ features a coaxial transducer arrangement coupled with an ellipsoid waveguide that generates an H/V directivity pattern of 40° x 60°.



Dispersion angle diagram of a single X15 HiQ using lines of equal sound pressure at -3 dB, -6 dB, -12 dB.

Monitor angles

X15 HiQ features risers that allow to change the monitor angle from 35° to 55°.



Loudspeaker configurations

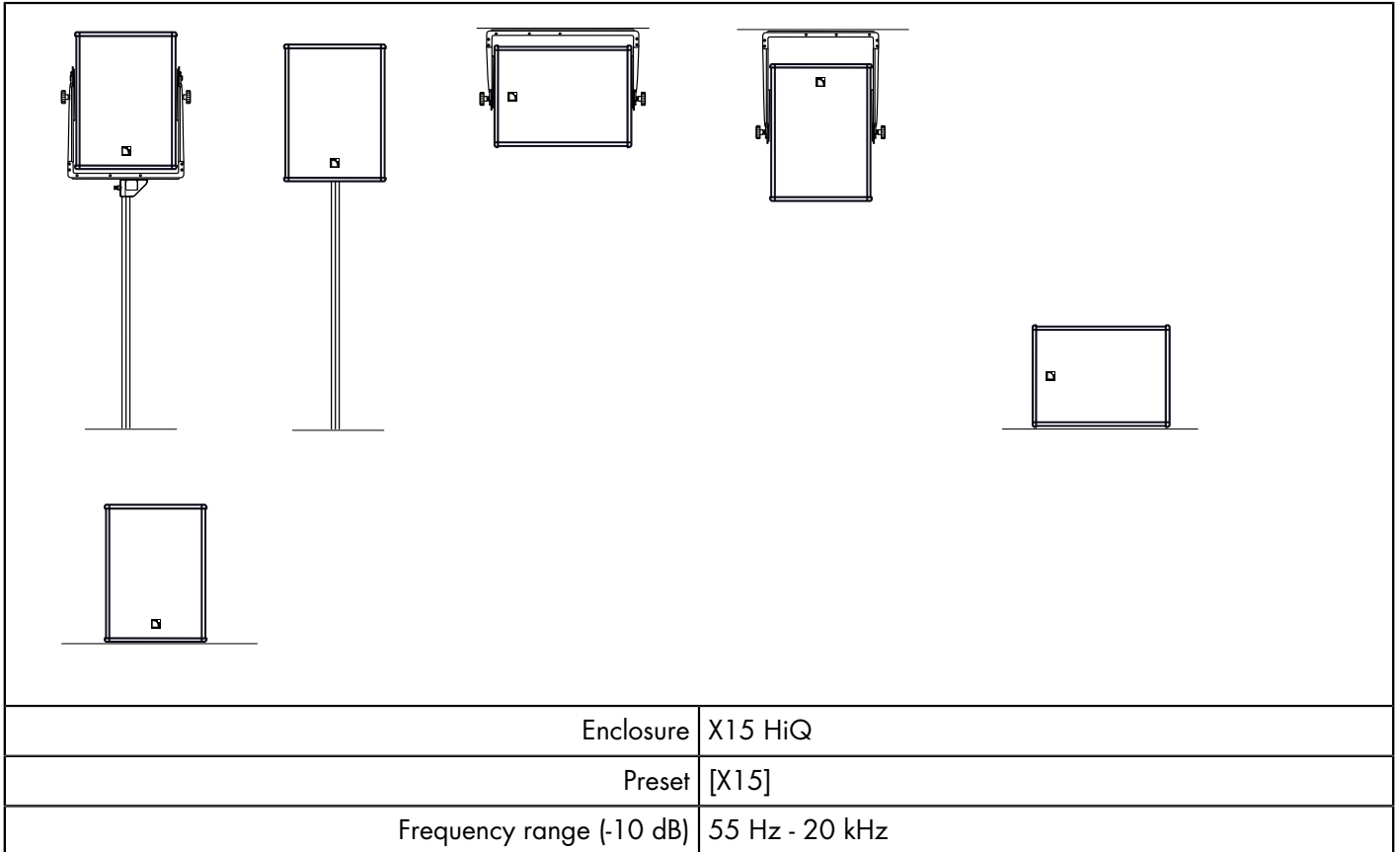
X15 HiQ point source

Deployed as a standalone point source, a X15 HiQ system operates over the nominal bandwidth of the X15 HiQ enclosure.

The [X15] preset allows for a reference frequency response in short throw applications.

The X15 HiQ enclosure is driven by the LA4X / LA8 / LA12X amplified controllers.

Standalone X15 HiQ



X15 HiQ point source with LF

Deployed as a point source with SB18 subwoofers, an X15 HiQ system operates with augmented LF resources.

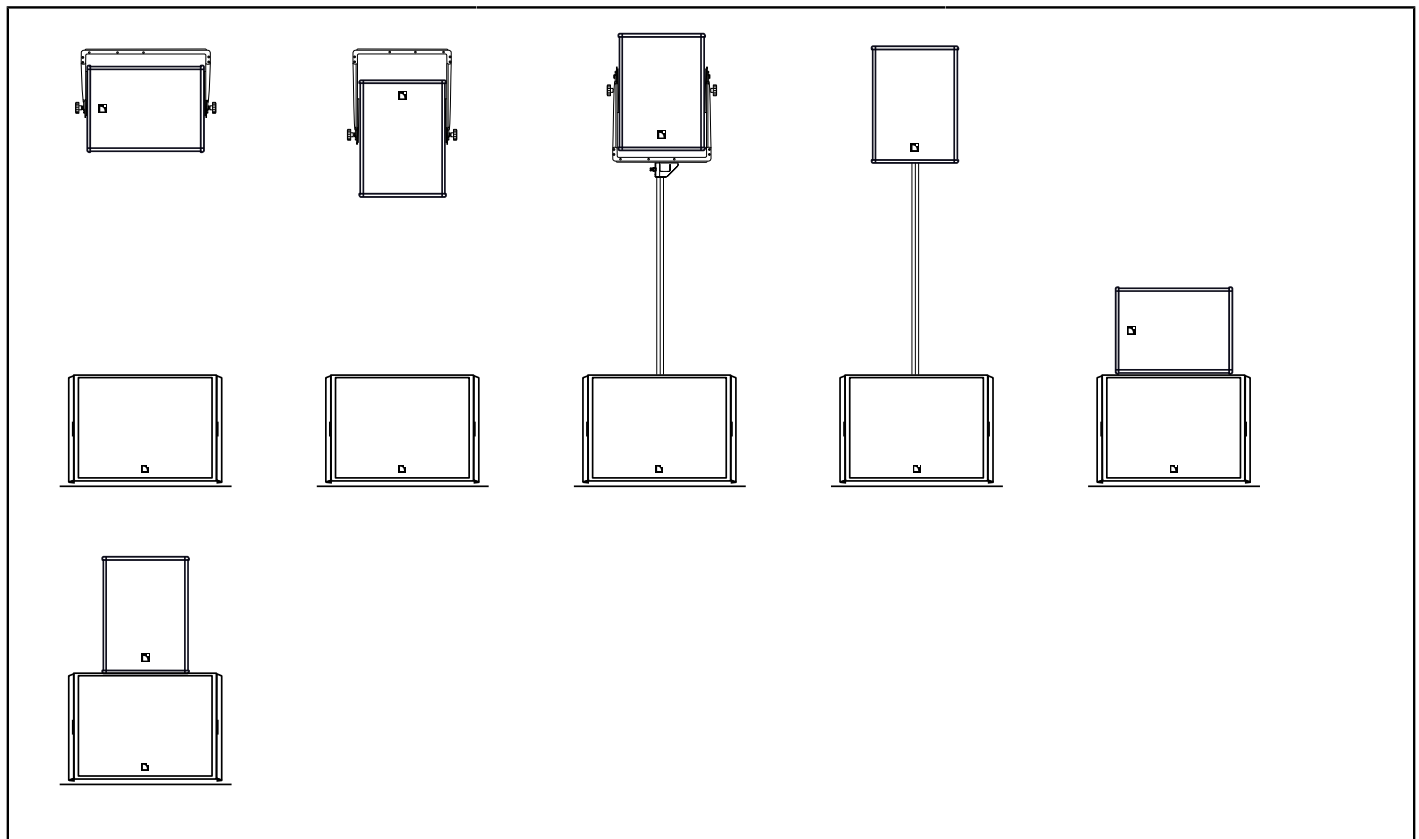
The [X15] preset allows for a reference frequency response in short throw applications.

The [SB18_100] preset provides the SB18 with an upper frequency limit at 100 Hz for an optimal frequency coupling with the X15 HiQ.

The X15 HiQ and SB18 enclosures are driven by the LA4X / LA8 / LA12X amplified controllers.

X15 HiQ with SB18

With SB18, the X15 HiQ system contour is reinforced by 5 dB at 100 Hz and the system bandwidth is extended down to 32 Hz.



Enclosure	X15 HiQ	SB18
Preset	[X15]	[SB18_100]
Frequency range (-10 dB)	32 Hz - 20 kHz	
Enclosure ratio	1 X15 HiQ : 1 SB18	



Delay values

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

Pre-alignment delays

[X15] + [SB18_100]	X15 HiQ = 0 ms	SB18 = 0 ms
--------------------	----------------	-------------

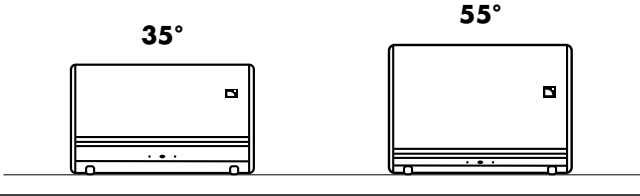
X15 HiQ stage monitor

Deployed as a stage monitor, an X15 HiQ system operates over the nominal bandwidth of the X15 HiQ enclosure.

The [X15_MO] preset allows for a reference frequency response in stage monitoring applications.

The X15 HiQ enclosure is driven by LA4X / LA8 / LA12X.

Standalone X15 HiQ


Enclosure X15 HiQ
Preset [X15_MO]
Frequency range (-10 dB) 52 Hz - 20 kHz

Paired X15 HiQ 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 X15 HiQ monitors, enter the following parameters to obtain the reference response curve of a single enclosure:

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

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

X15 HiQ stage monitor with LF

Deployed as a stage monitor with SB18 subwoofers, an X15 HiQ system operates with augmented LF resources.

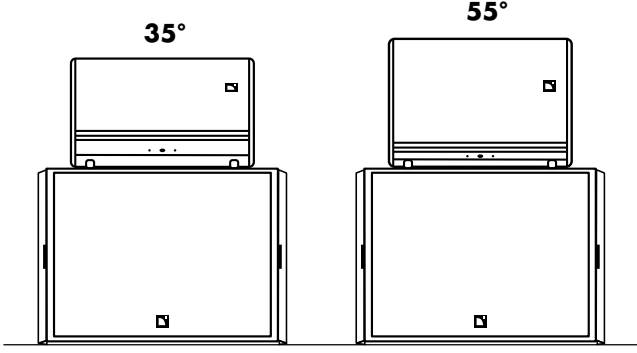
The [X15_MO] preset allows for a reference frequency response in stage monitoring applications.

The [SB18_100] preset provides the SB18 with an upper frequency limit at 100 Hz for an optimal frequency coupling with the X15 HiQ.

The X15 HiQ and SB18 enclosures are driven by the LA4X / LA8 / LA12X amplified controllers.

X15 HiQ with SB18

With SB18, the X15 HiQ system contour is reinforced by 5 dB at 100 Hz, and the system bandwidth is extended down to 32 Hz.

		
Enclosure	X15 HiQ	SB18
Preset	[X15_MO]	[SB18_100]
Frequency range (-10 dB)	32 Hz - 20 kHz	
Enclosure ratio	1 X15 HiQ : 1 SB18	

! Delay values

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

Pre-alignment delays

[X15_MO] + [SB18_100]	X15 HiQ = 0 ms	SB18 = 0 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.

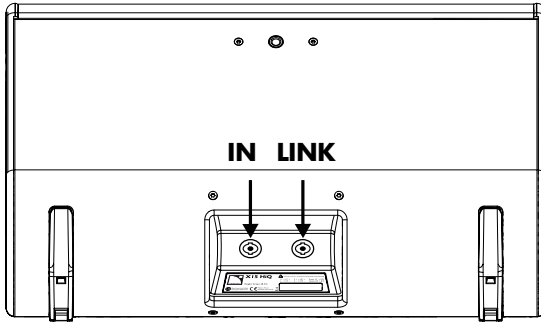
If the subwoofers are driven from a dedicated amplified controller using a subwoofer factory preset, they are operated in normal latency mode. Therefore, an additional delay should be set to the [xx_MO] low latency channels to align them: 2.66 ms on LA8 or 3.00 ms on LA4X and LA12X.

Loudspeaker connection

Connectors

X15 HiQ is equipped with two 4-point speakON connectors.

X15 HiQ

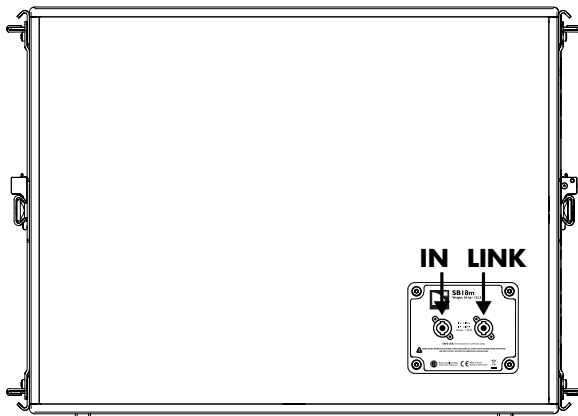


Internal pinout for L-Acoustics 2-way active enclosures

speakON points	1 +	1 -	2 +	2 -
Transducer connectors	LF +	LF -	HF +	HF -

SB18 is equipped with two 4-point speakON connectors.

SB18



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
X15 HiQ	1	2
SB18	1	4

*For passive loudspeakers, the value corresponds to the number of enclosures in parallel on the output. For active loudspeakers, the value corresponds to the number of sections in parallel on the output.

Impedance load

X15 HiQ

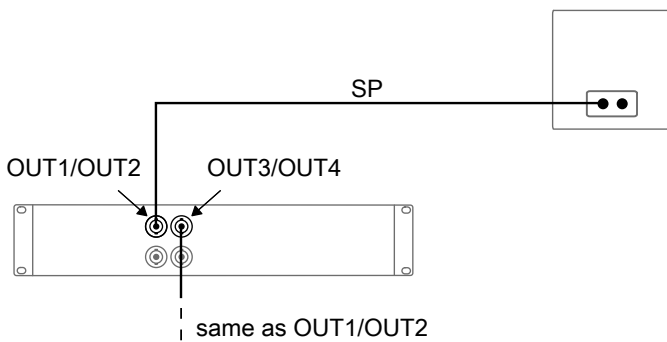
1 enclosure: LF 8 Ω / HF 8 Ω

SB18

1 enclosure: 8 Ω

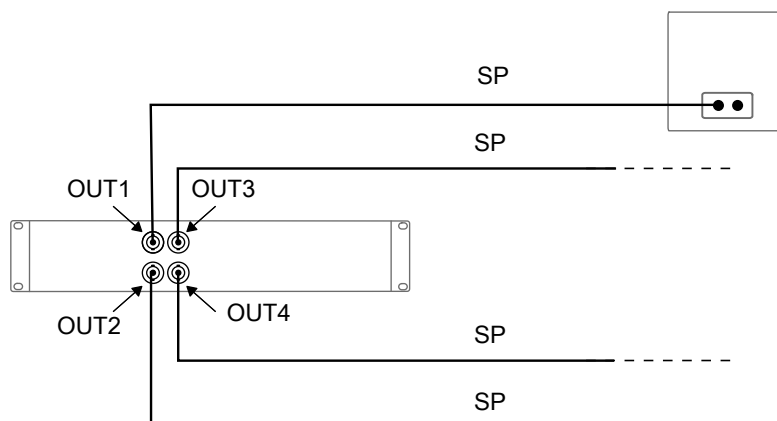
Connecting 2-way active enclosures

SP on speakON output

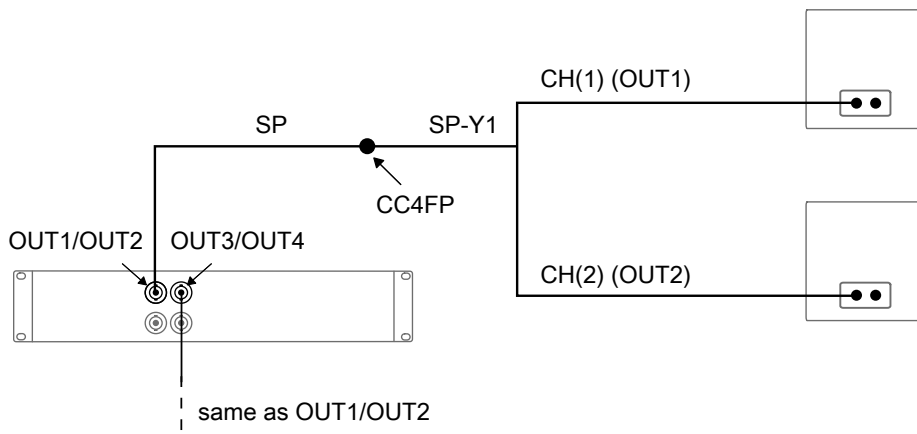


Connecting 2-way passive enclosures or subwoofers

SP on speakON output



SP and SP-Y1 on speakON output



Connection to LA8

Maximum number of enclosures per LA8

enclosure	max enclosures in parallel *	max enclosures per controller
X15 HiQ	2	4
SB18	2	8

*For passive loudspeakers, the value corresponds to the number of enclosures in parallel on the output. For active loudspeakers, the value corresponds to the number of sections in parallel on the output.

Impedance load

X15 HiQ

- 1 enclosure: LF 8 Ω / HF 8 Ω
- 2 enclosures in parallel: LF 4 Ω / HF 4 Ω

SB18

- 1 enclosure: 8 Ω
- 2 enclosures in parallel: 4 Ω

Connection to LA12X

Maximum number of enclosures per LA12X

enclosure	max enclosures in parallel *	max enclosures per controller
X15 HiQ	3	6
SB18	3	12

*For passive loudspeakers, the value corresponds to the number of enclosures in parallel on the output. For active loudspeakers, the value corresponds to the number of sections in parallel on the output.

Impedance load

X15 HiQ

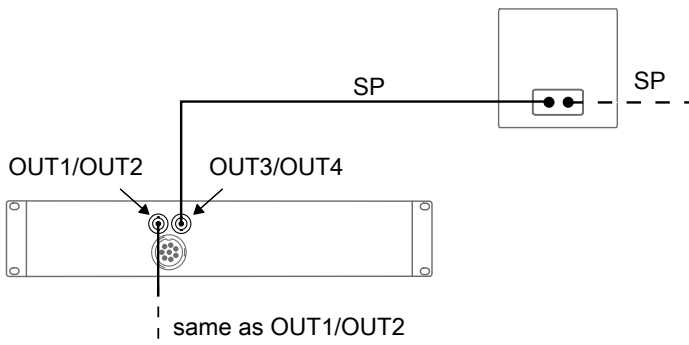
- 1 enclosure: LF 8 Ω / HF 8 Ω
- 2 enclosures in parallel: LF 4 Ω / HF 4 Ω
- 3 enclosures in parallel: LF 2.7 Ω / HF 2.7 Ω

SB18

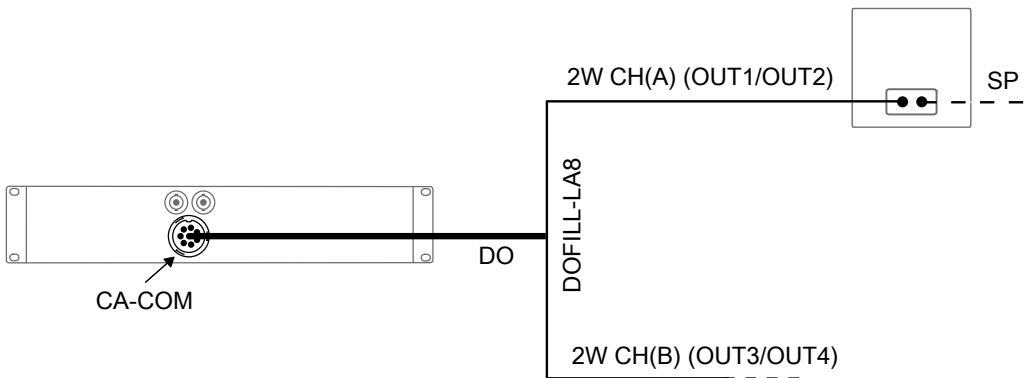
- 1 enclosure: 8 Ω
- 2 enclosures in parallel: 4 Ω
- 3 enclosures in parallel: 2.7 Ω

Connecting 2-way active enclosures

SP on speakON output

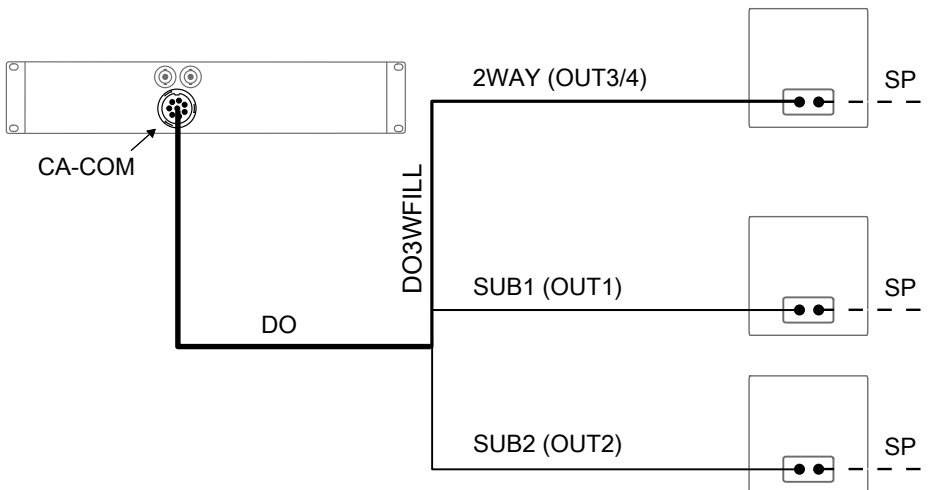


DO and DOFILL-LA8 on CA-COM output



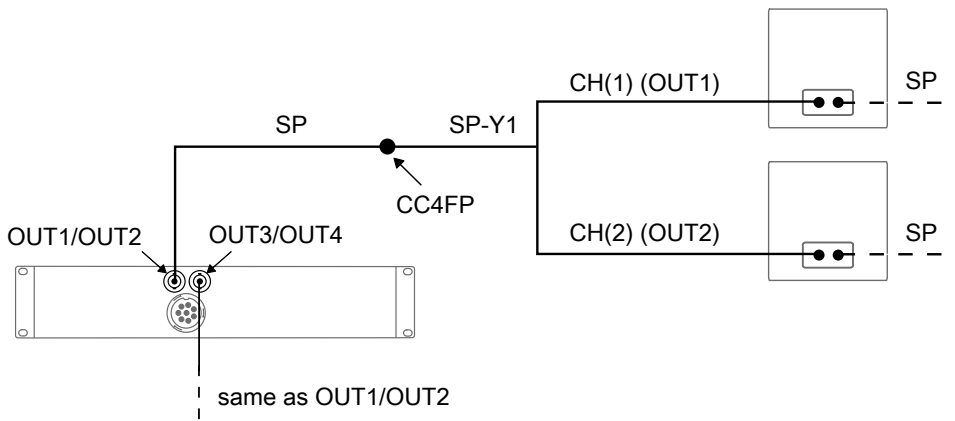
Connecting a 2-way active enclosure with subwoofers

DO and DO3WFILL on CA-COM output

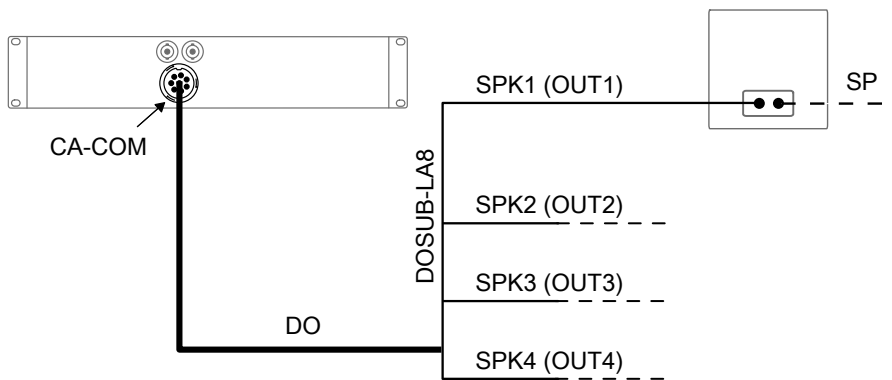


Connecting 2-way passive enclosures or subwoofers

SP and SP-Y1 on speakON output



DO and DOSUB-LA8 on CA-COM output



Preset description

[X15] [X15_MO]

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

[SB18_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

[SB18_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

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

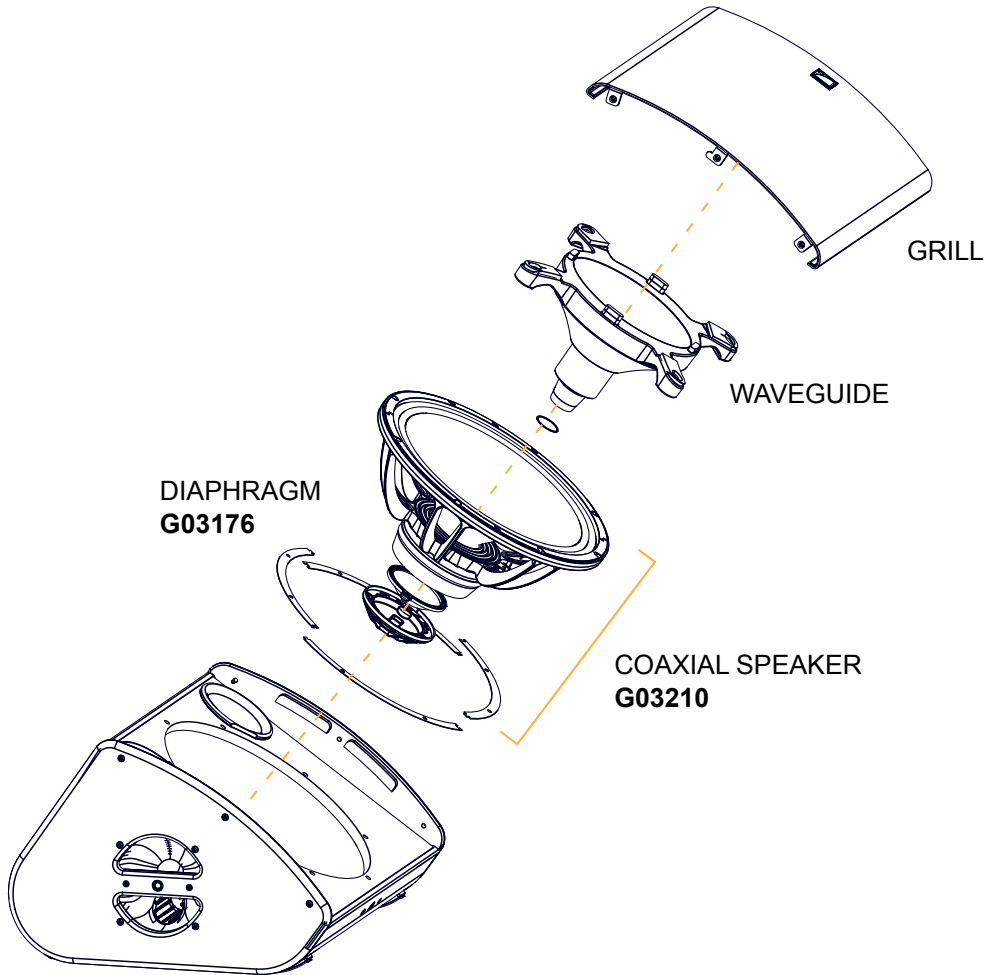
For your installation projects, you can use the more detailed L-ACOUSTICS calculation tool to evaluate cable length and gauge based on the type and number of enclosures connected. The calculation tool is available on our website:

<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

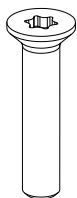
Tools

- torque screwdriver
- T25 Torx bit

Repair kit

G03210 - KR coaxial speaker X15 HiQ or

G03176 - KR diaphragm X15 HiQ



x6

S100033

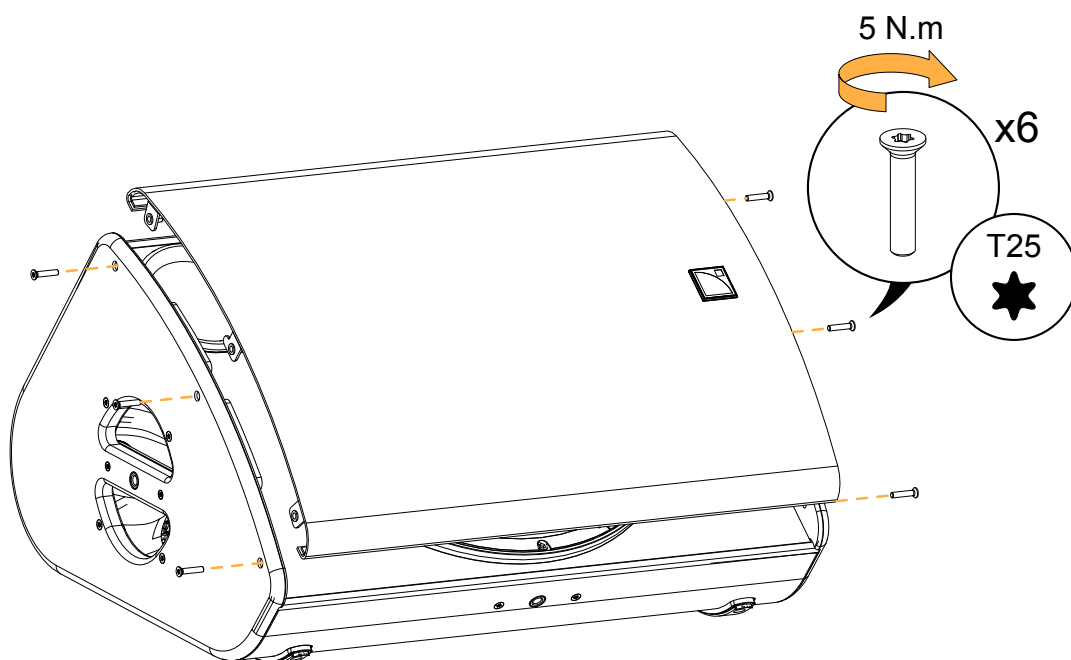
M5x25 Torx

Exploded view

! For safety reasons, always use the new screws and spare parts provided in the KR.
If no new screws are available, use blue threadlocker.

! Gradually tighten the screws following a star pattern.

Position the logo on the right side.



D/R - Waveguide

Tools

- torque screwdriver
- 4 mm hex bit
- 5 mm hex bit

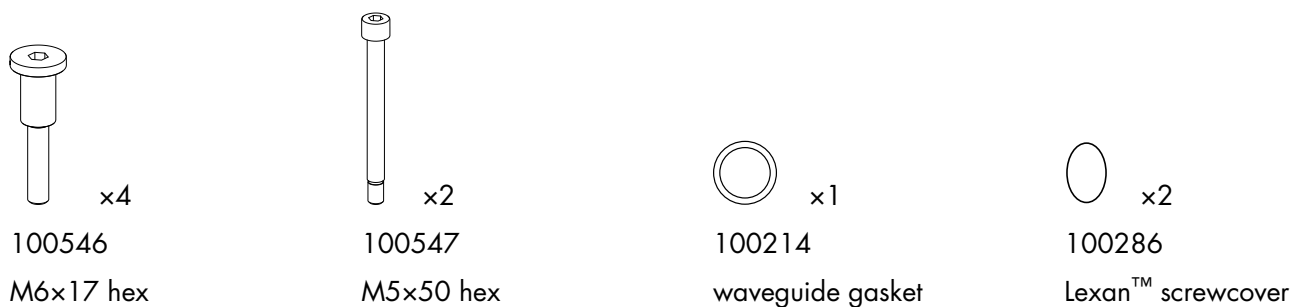
Consumables

- cyanoacrylate glue

Repair kit

G03210 - KR coaxial speaker X15 HiQ or

G03176 - KR diaphragm X15 HiQ



Prerequisite

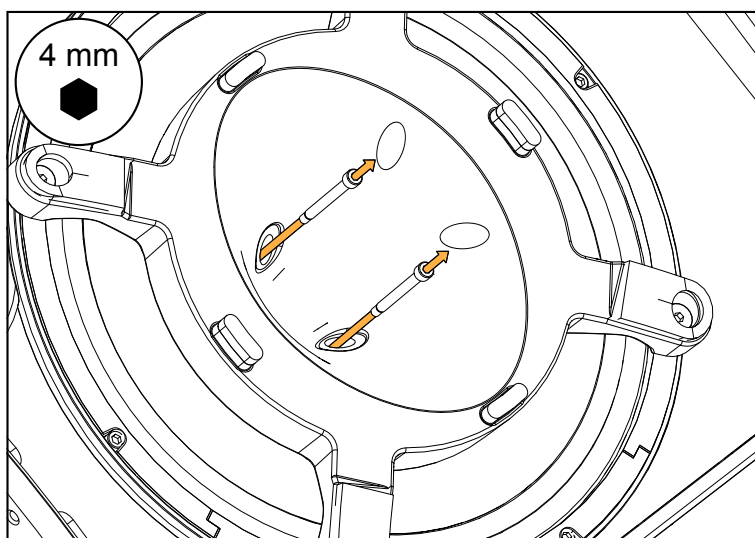
Grill disassembled.

See [Grill](#) (p.23).

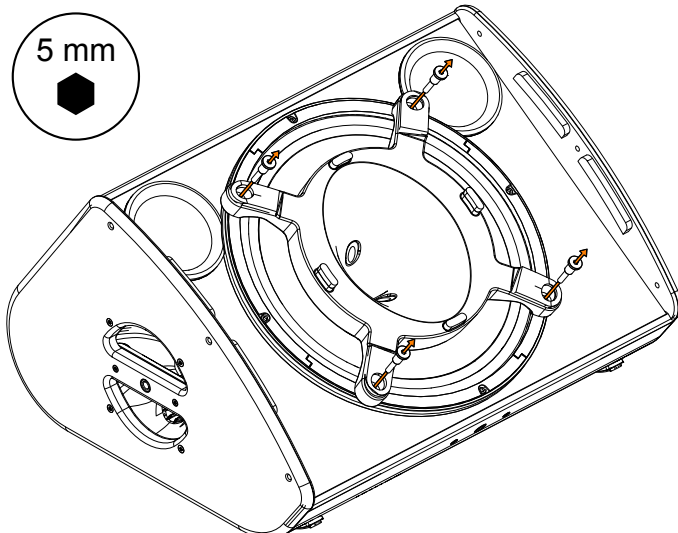
Disassembly

Procedure

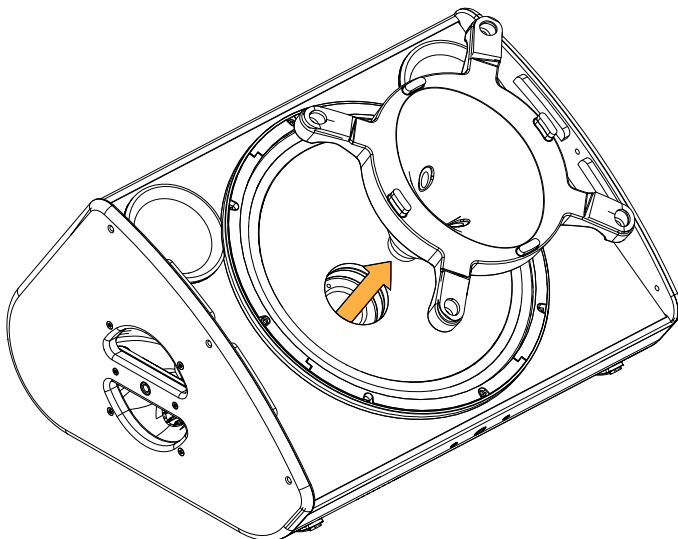
1. Remove the Lexan screw covers.
2. Remove the two screws securing the waveguide to the speaker.



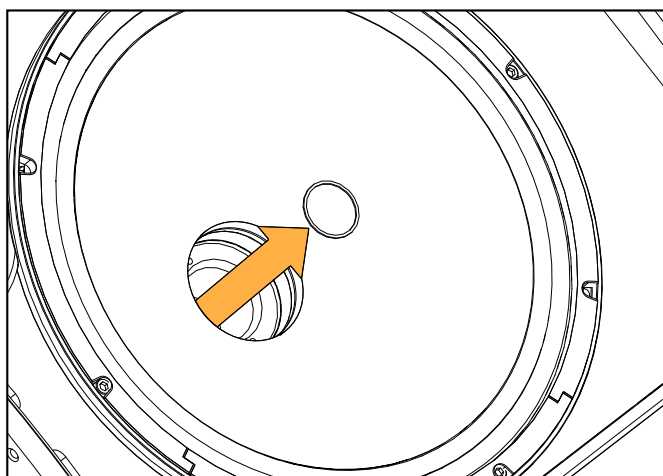
- 3.** Remove the four remaining screws.



- 4.** Carefully remove the waveguide.



- 5.** Remove the waveguide gasket.



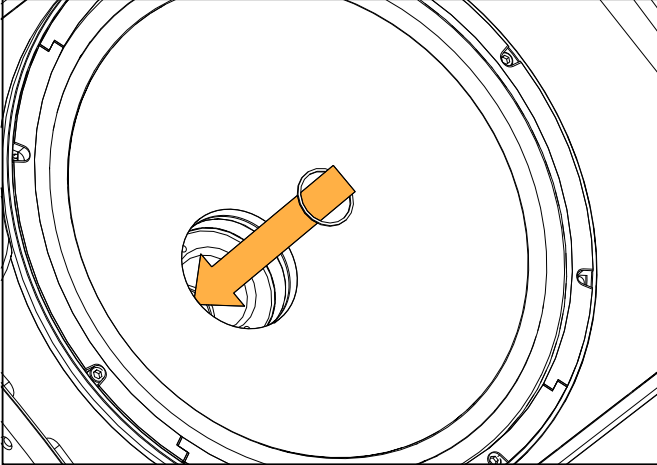
Reassembly

About this task

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

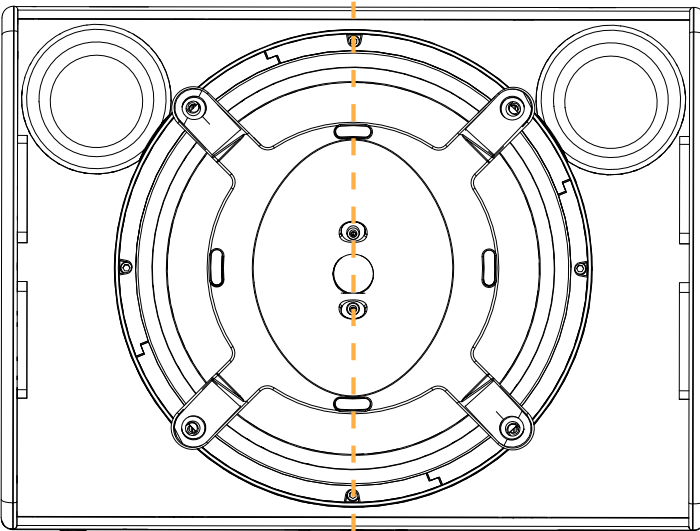
Procedure

1. Place the gasket inside the throat of the speaker.

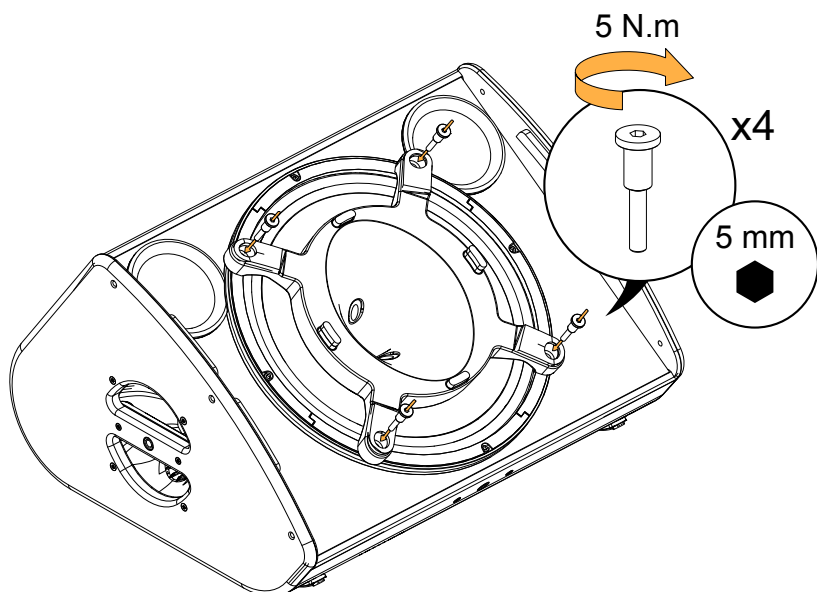


2. Position the waveguide.

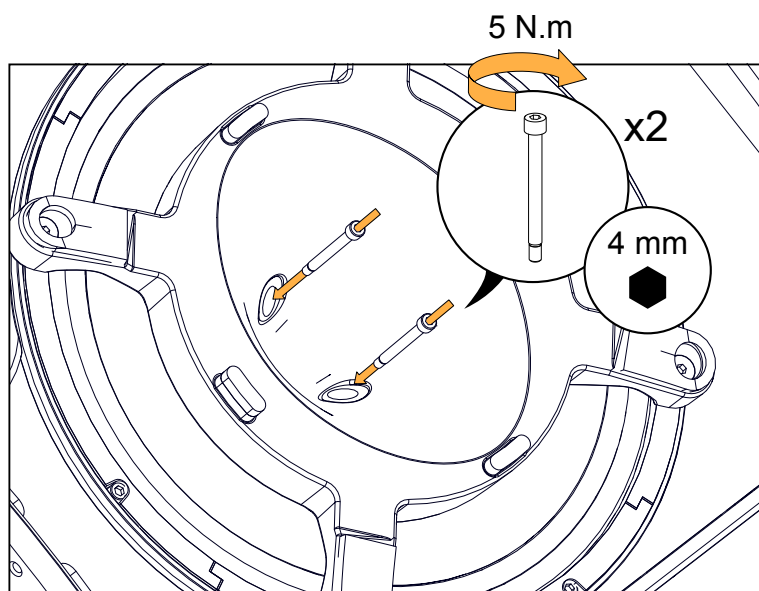
The center holes are aligned with the connectors.



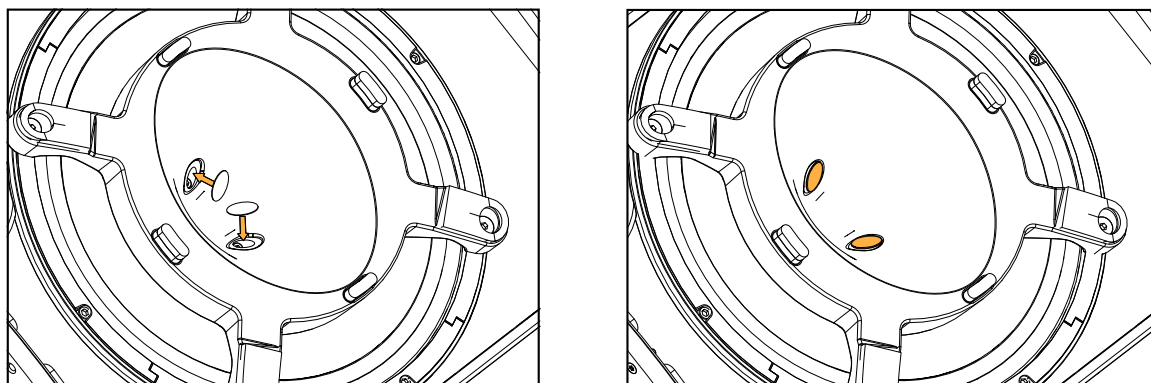
- 3.** Secure the waveguide to the cabinet with the provided 100546 screws.



- 4.** Secure the waveguide to the speaker with the provided 100547 screws.



- 5.** Stick the Lexan screw covers with the cyanoacrylate glue.



D/R - Coaxial loudspeaker

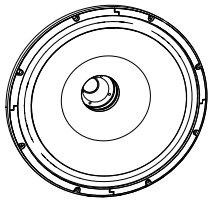
Tools

- torque screwdriver
- 5 mm hex bit

Repair kit

G03210 *

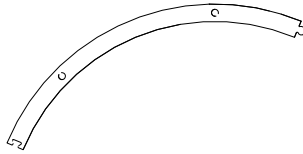
KR coaxial speaker X15 HiQ



x1

1630

15" coaxial speaker - 8 ohms



x4

1245

15" speaker gasket



x4

S100054

M6x30 hex

* The screws and gaskets are also available in G03176 - KR diaphragm X15 HiQ .

Prerequisite

Grill disassembled.

See [Grill](#) (p.23).

Waveguide removed.

See [Waveguide](#) (p.24).

Exploded view



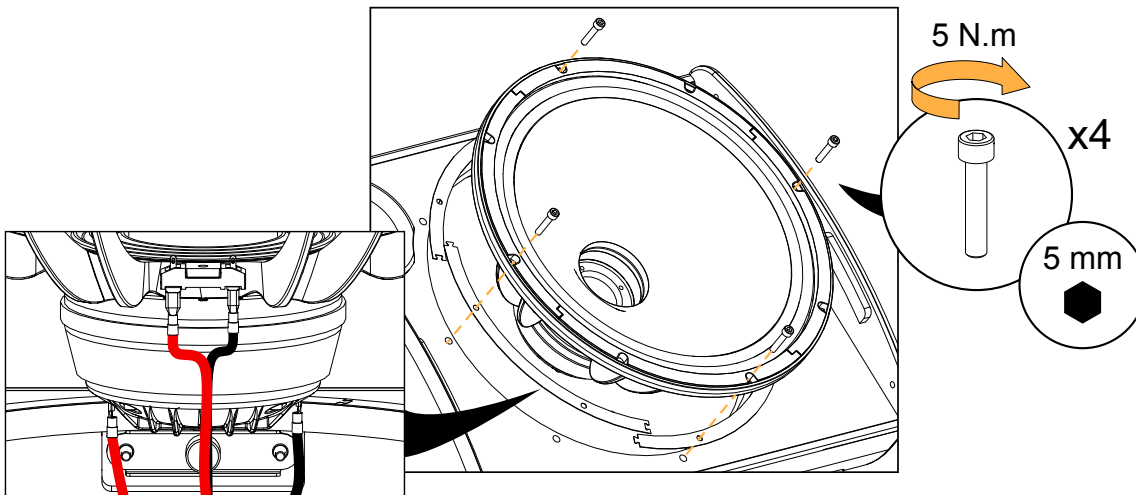
For safety reasons, always use the new screws and spare parts provided in the KR.



Gradually tighten the screws following a star pattern.



If the speaker gasket is damaged, remove and replace it.



What to do next

Perform the [Acoustical check](#) (p.30) procedures.

D/R - HF diaphragm

Tools

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

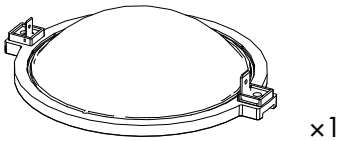
Consumables

- double face adhesive tape

Repair kit

G03176

KR diaphragm X15 HiQ



x1

17581

diaphragm assembly (with 2 shims)



x4

S100082

M4x14 hex

Prerequisite

Grill disassembled.

Waveguide removed.

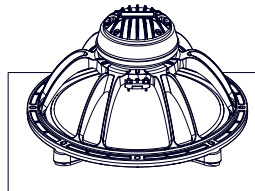
Coaxial speaker removed.

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

See [Grill](#) (p.23).

See [Waveguide](#) (p.24).

See [Coaxial loudspeaker](#) (p.28).



Disassembly

Procedure

1. Remove the four screws securing the cover.
Use the 3 mm hex bit.
2. Remove the cover.
3. Carefully remove the diaphragm.
4. If there are shims on the dome, carefully remove them.
Take note of how many and what kind of shims are present.

Reassembly

About this task



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

Procedure

1. Clean the dome and the air gap.

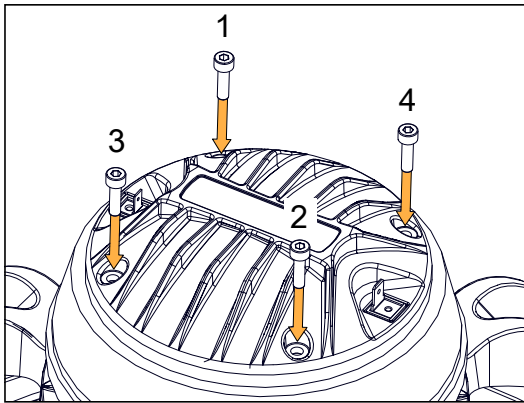
Use a blower or double face adhesive tape to remove any particle.



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

2. Place the same kind and number of shims that were initially present.
3. Carefully place the diaphragm.
4. Position the diaphragm using the LF cable connectors as reference points.
Place the small HF connector on the same side as the small LF connector.
5. Secure the cover to the speaker using four S100082 screws.
 - a) Gradually secure each screw manually with the 3 mm hex wrench.

Follow a cross scheme.



- b) Tighten the screws in the same order with the electric screwdriver.
Use the 3 mm hex bit. Set the torque to 3.5 Nm.

What to do next

Perform the [Acoustical check](#) (p.30) procedures.

Acoustical check

Enclosure check



This feature is available on:

LA4X

LA12X

ENCLOSURE CHECK measures impedance at the reference frequencies for the connected loudspeaker family. The measured impedance is compared to the expected range allowing for fast detection of loudspeakers presenting circuit continuity issues.



The results can be used for preliminary diagnosis but cannot replace a comprehensive quality control.

Prerequisite



ENCLOSURE CHECK measurements can only be reliable if the following requirements are met:

Environment and temperature:

- Ambient temperature must be comprised between 0 °C / 32 °F and 40 °C / 104 °F. Ideal temperature is 20 °C / 68 °F.
- Enclosures must be at room temperature. If warm from a recent high level use or recently moved from a cold environment, let the loudspeakers reach room temperature before starting.

Enclosures:

- Enclosures must be included in the embedded factory preset library.
- Enclosures must be in nominal operating conditions:
 - Remove covers or dollies obstructing the loudspeakers or the vents.
 - Check for obvious physical damage or air leak: visually inspect the grill, gasket, cabinet, and connector plate for loose, missing or damaged parts.

Connection:

- Use only 10 m / 30 ft 4 mm² / AWG 11 speaker cables.
- Do not connect enclosures in parallel.

Amplified controllers:

- LA4X must run at least firmware version 1.1.0.
- LA4X load sensors must be calibrated. Refer to the technical bulletin for more information.
- LA4X must warm up for at least 10 minutes after power up. Do not power off, reboot or switch to standby mode to avoid resetting the countdown.
- Load a preset corresponding to the connected loudspeaker's family. Presets from the user memories may be used on condition they are made of presets supported in the embedded factory preset library.

Procedure

1. Power up the amplified controller. Let LA4X warm up for at least 10 minutes.
2. Connect the loudspeaker enclosures to the amplified controller.
3. Load a preset from or built from the embedded library corresponding to the connected loudspeaker family.
4. On the amplified controller, use the encoder wheel to select **MONITORING & INFO**. Press the OK key or the encoder wheel to validate.
5. Use the encoder wheel to select **ENCLOSURE CHECK**.



Beware of sound levels.

Although the sound pressure levels generated for the ENCLOSURE CHECK are moderate, do not stay within close proximity of the loudspeakers and consider wearing ear protection.

6. Press the OK key or the encoder wheel to launch the ENCLOSURE CHECK.

The amplified controller generates short sinusoidal signals simultaneously for each connected output.

The amplified controller displays the results for each output.

7. Depending on the displayed results, follow the instructions in the table.

result	interpretation	instructions
OK	measured impedance is within expected range	enclosure is in working order electrically
?	unsupported preset family	only supported enclosures should be tested
NC	Not Connected	if cables are connected: a. inspect the cables and connections b. go to step 8 (p.31)
NOK	measured impedance is not within expected range	a. check that all the prerequisites are met, in particular that the loaded preset corresponds to the connected speaker's family b. inspect the cables and connections c. go to step 8 (p.31)
UNDEF	measured impedance is undefined	

8. Under NC, NOK and UNDEF results, press and hold the corresponding OUT key.

The amplified controller displays:

- the tested frequencies,
- information on the measured impedance:
 - OPEN for open circuit (found in NC results),
 - SHORT for short circuit (found in NOK results), or
 - a percentage of variation from the expected range (found in NOK and UNDEF results)
- the number of operational transducers out of the total



Low variations from the expected range are acceptable: displayed percentage can be different from 0 and all transducers considered operational.

Listening test

Procedure

1. Load the preset on an LA4X / LA8 / LA12X amplified controller.
2. Connect a sinus generator to the amplified controller.



Risk of hearing damage

Set a low sound level to start and use ear protection to adjust before testing.

3. Scan the bandwidth focusing on the usable range.
The sound should remain pure and free of unwanted noise.

Troubleshooting for HF speakers

One or more HF loudspeaker produces high-frequency harmonic distortions, strange vibrations or weak sound.

Possible causes

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

Procedure

1. Perform the diaphragm disassembly procedure.
2. Visually inspect the diaphragm and the voice coil.
If any damage is visible, replace the diaphragm.
3. Clean the air gap thoroughly.
4. Perform the reassembly procedure.
Pay close attention to the number of shims and the position of the diaphragm.
Apply the recommended torque.
5. Repeat the listening test.



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

Troubleshooting for LF speakers

One or more LF loudspeaker produces distorted, buzzing, rubbing, clicking, muffled or weak sound.

Possible causes

- The screws used for reassembly are too loose.
- There is an air leak in the gasket.
- There is dust on the cone.
- The cone is damaged.
- The surround is torn or delaminated.
- The voice coil and/or the spider is damaged.

Procedure

1. Perform the loudspeaker disassembly procedure.
2. Visually inspect the loudspeaker and the cables.
If any damage is visible, replace the loudspeaker.
3. Carefully clean the loudspeaker with a dry cloth.
4. Perform the reassembly procedure.
Replace the loudspeaker gasket and the screws.
Apply the recommended torque.
5. Repeat the listening test.
If the problem persists, replace the loudspeaker.

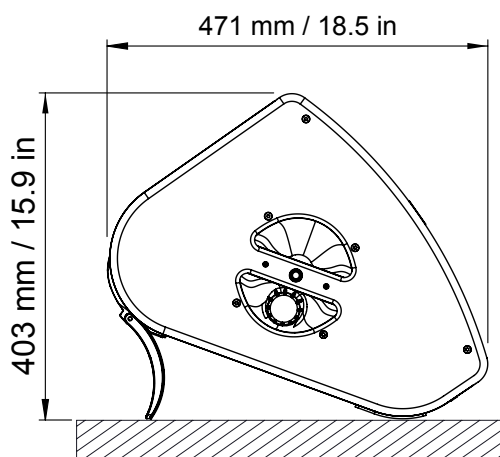
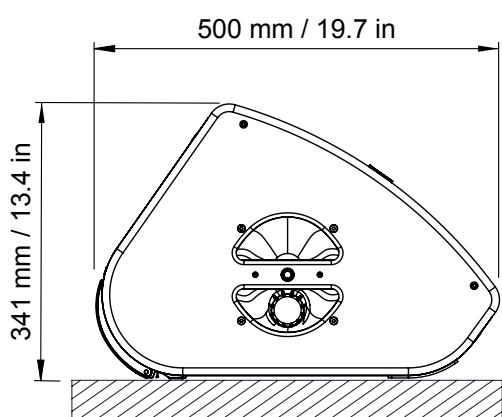
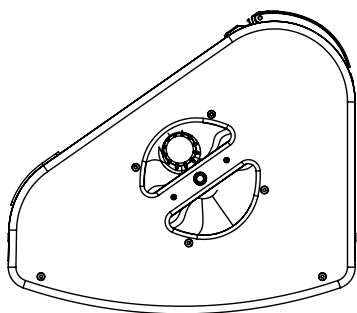
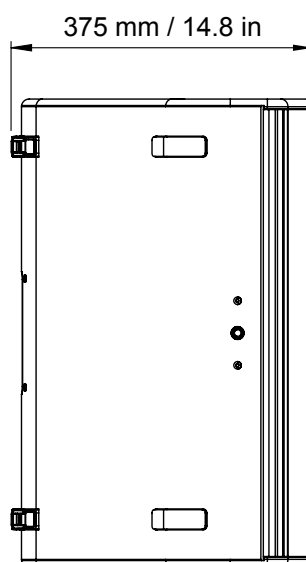
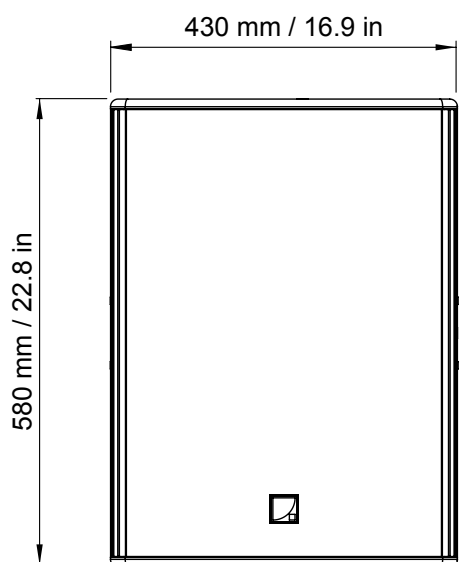
Specifications

X15 HiQ specifications

Description	2-way active coaxial enclosure: 15" LF + 3" HF diaphragm, amplified by LA4X / LA8 / LA12X
Usable bandwidth (-10 dB)	55 Hz - 20 kHz ([X15])
Maximum SPL¹	138 dB ([X15])
Nominal directivity	vertical: 60° symmetric horizontal: 40° symmetric
Monitoring angle	without risers: 35° with risers: 55°
Transducers	LF: 1 × 15" cone driver HF: 1 × 3" diaphragm compression driver, neodymium
Acoustical load	bass-reflex, L-Vents, ellipsoidal waveguide
Nominal impedance	LF: 8 Ω HF: 8 Ω
Connectors	IN: 1 × 4-point speakON LINK: 1 × 4-point speakON
Rigging and handling	2 handles 1 DIN580-compatible M8 threaded insert 4 M10 threaded inserts 2 × 35 mm pole sockets
Weight (net)	21 kg / 46.3 lb
Cabinet	first grade Baltic beech and birch plywood
Front	steel with anti-corrosion coating acoustically neutral 3D fabric
Finish	dark grey brown Pantone 426C custom RAL code on special order
IP	IP43

¹ Peak level measured at 1 m under free field conditions using pink noise with crest factor 4 (preset specified in brackets).

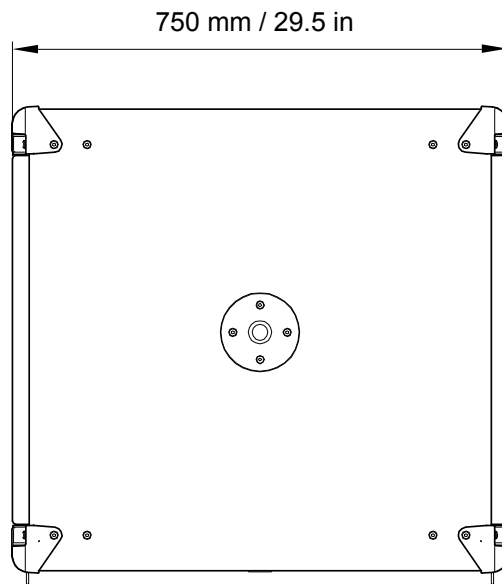
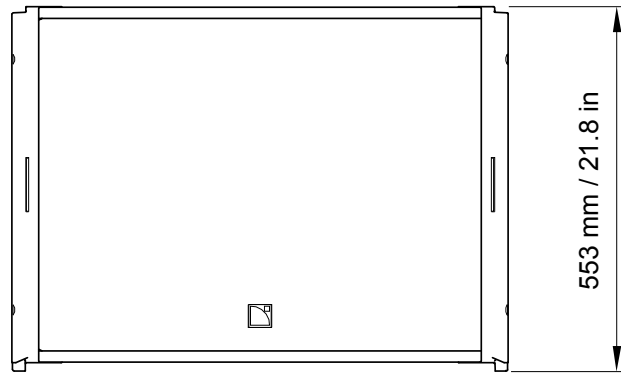
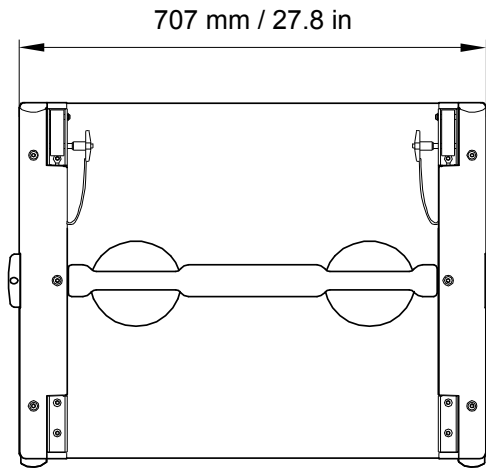
X15 HiQ dimensions



SB18 specifications

Description	High power compact subwoofer: 1 x 18" , amplified by LA4X / LA8 / LA12X
Low frequency limit (-10 dB)	32 Hz ([SB18_100])
Maximum SPL¹	138 dB ([SB18_100])
Directivity	standard or cardioid
Transducers	1 x 18"
Acoustical load	bass-reflex, L-Vents
Nominal impedance	8 Ω
Connectors	IN: 1 x 4-point speakON LINK: 1 x 4-point speakON
Rigging and handling	2 handles integrated into the cabinet captive rigging system 1 x 35 mm pole socket
Weight (net)	52 kg / 115 lb
Cabinet	first grade Baltic birch plywood
Front	steel grill with anti-corrosion coating acoustically neutral 3D fabric
Rigging components	steel with anti-corrosion coating
Finish	dark grey brown Pantone 426C
IP	IP45

¹ Peak level at 1 m under half space conditions using pink noise with crest factor 4 (preset specified in brackets).

SB18 dimensions



L-Acoustics, an L-Group Company

13 rue Levacher Cintrat - 91460 Marcoussis - France
+33 1 69 63 69 63 - info@l-acoustics.com
www.l-acoustics.com

L-Acoustics GmbH

Steiermärker Str. 3-5
70469 Stuttgart
Germany
+49 7 11 89660 323

L-Acoustics Ltd.

PO. Box Adler Shine - Aston House
Cornwall Avenue - London N3 1LF
United Kingdom
+44 7224 11 234

L-Acoustics Inc.

2645 Townsgate Road, Suite 600
Westlake Village, CA 91361
USA
+1 805 604 0577



L-GROUP

www.l-group.com